

**Bird Beaks****Grade 4**

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**Science Content Standards:** Grade 4, 3b — *Students know* that in any particular environment, some kinds of plants and animals survive well, some survive less well, and some cannot survive at all.

**Lesson Concept:** The type and amount of food available affects the survival of birds (and other animals). The shape of the beak determines the kind of food a bird can consume.

**Conceptual Flow:**

- ▶ In any particular environment, some kinds of plants and animals survive well, some survive less well, and some cannot survive at all.
- ▶ Organisms can live only in environments to which they are adapted. Adaptation is a genetic process that takes many generations to develop in populations within a species.
  - Each species has adaptations that are inherited.
  - These adaptations allow a species to survive in a particular environment.
  - When the environment changes, an individual cannot change its adaptations (which are inherited).
  - However, when the environment changes, an individual may be able to change its behavior (accommodation).
- ▶ The shape of the beak can tell us something about a bird's environment. Bird beaks are adaptations to the environment, for example some birds:
  - peck grubs out of trees;
  - probe in sand for worms;
  - drink nectar from flowers;
  - eat flying insects;
  - strain tiny plants out of water;
  - eat fish;
  - eat dead animals;
  - eat seeds.
- ▶ The shape of the beak can also tell us the ecological role of a bird in a food web.

## Teacher Background:

Organisms (living things) have biological requirements for growth and survival and can live only in environments to which they are well adapted. If an environment changes in a way that is harmful to an organism, the organism may not survive.

**Adaptation** is a genetic process that takes many generations to be perceived, so a single individual cannot “adapt” to a change. For example, the thick, blubbery skin of whales is an evolutionary adaptation to cold water.

—Adapted and excerpted from the *Science Framework for California Public Schools: Kindergarten Through Grade Twelve*.

This adaptation is different from the types of changes that help a single individual survive, such as a change in seasonal diet or coloration, which are properly called **accommodations**.

### Websites:

Kidwings Educational Site about Birds

[www.kidwings.com/bodyparts/beaks/index.htm](http://www.kidwings.com/bodyparts/beaks/index.htm)

This website has interactive activities about birds that were developed by an elementary school library media specialist in New York. The bird beaks pages show photographs of bird skulls, which you click on to find out more about what that bird eats and where it lives.

Los Angeles Natural History Museum

[www.nhm.org/birds/home.html](http://www.nhm.org/birds/home.html)

Bird Site of the Los Angeles Natural History Museum

This site provides general information on bird beaks, feet, coloration, and more.

### Accountable Talk

In Accountable Talk, students are able to discuss with a partner or in groups, a topic they are studying. The “stems” help students to focus their discussions and may be selected by the teacher; but the students should carry on the discussion with minimal interference from the teacher. Students will need to practice to listen to each other.

Accountable Talk sharpens students’ thinking by reinforcing their ability to build and use their knowledge. Teachers create norms and skills of Accountable Talk in their classrooms by modeling appropriate forms of discussion and by questioning, probing, and leading conversations. (from K-12 Alliance/ WestEd Accountable Talk)

Accountable Talk Stems useful for this lesson:

“I observe...”

“I notice that...”

“The beaks are different because...”

## Materials Needed for the Lesson:

### For Explore #1:

#### Teacher Preparation

- Obtain a poster of a bird (or birds).
- Make copies of the “Natural Bird Beaks and Food Sources” for each student.
- Write the following “Accountable Talk and Stems” on the board:
  - What do you observe about these bird beaks? Student response “I observe...”
  - What is it about the bird’s beak that helps the bird to get its food? “I notice that...”
  - How are the beaks different? “The beaks are different because...”

#### Student Handout

“Natural Bird Beaks and Food Sources” for each student

### For Explore #2

#### Teacher Preparation

Obtain a set of two pictures of different birds to each group. (Sources of these may be a website, calendars, wildlife magazines)

#### Student Hands-on Materials

Two pictures of birds for each group

#### Student Handout

Science Journals or a piece of paper on which to write

### For Explore #3

#### Teacher Preparation

- Obtain the items listed below for 6 groups of students. Each group will consist of 4 or 5 students (all groups should be the same size – if possible). For Group 1 - 4 or 5 scissors; Group 2 - 4 or 5 tweezers; Group 3 - 4 or 5 spoons; Group 4 - 4 or 5 clothespins; Group 5 - 4 or 5 pencils with double-sided tape on tip; Group 6 - 4 or 5 forks. These represent the beaks of birds (Scissorsbills, Tweezerbills, Spoonbills, Clothespinbills, Tapebills, and Forkbills).
  - Scissors
  - Tweezers
  - Spoons
  - Clothespins
  - Double-sided tape on tip of an unsharpened pencil
  - Forks

- Obtain food sources for the above “beaks”; 30 of each of the following: marbles, one-inch pipe cleaners, toothpicks, paper clips, twigs of pencils, 2” X 2” pieces of paper
- Obtain “Dixie” cups (or other paper cups) – one for each student.
- Make a transparency or class chart of “Simulated Bird Beaks and Food Class Chart”
- Make copies of the “Beak and Food Chart” for each student
- Select an outside area where the game could be played (this game could also be played indoors, if necessary)
- Whistle (if available)

**Student Hands-on Materials**

Each student will have one simulated beak (e.g., scissors or tweezers or spoons, etc.) and a paper cup

**Student Handout**

“Beak and Group Chart” for each student

**5E Lesson: Bird Beaks of Lesson**

Teacher Does	Student Does	Concept
<p><b><u>ENGAGE:</u></b></p> <p>Remind students that they have been learning about “How the availability of resources affects survival of a species.”</p> <p>Show a poster of a bird (or birds).</p> <p>Write Prompt #1 on the board and ask:</p> <ul style="list-style-type: none"> <li>▶ <i>What do you know about bird beaks?</i></li> <li>▶ <i>Do a “Think, Pair, Share”:</i> think for 30 seconds; then share with a partner.</li> </ul> <p>Give students time to think and share; then ask pairs to share with the class and write student responses on board.</p> <p>Other questions to ask students:</p> <ul style="list-style-type: none"> <li>▶ <i>What do birds eat?</i></li> <li>▶ <i>Do all birds eat the same kind of food? Why do you think that they don’t?</i></li> </ul>	<p>Students think for 30 seconds about Prompt #1 “What do you know about bird beaks?”</p> <p>Students talk with talking partner about the prompt. Then share with the teacher and class.</p> <p><b>Expected Student Response (ESR):</b> Some beaks are long; some are short; beaks help birds get food.</p> <p><b>ESR:</b> seeds; some, like owls eat mice; some eat bugs</p> <p><b>ESR:</b> No; there wouldn’t be enough food for all birds.</p>	<p>Different birds have different shaped beaks.</p>

Teacher Does	Student Does	Concept
<p><b><u>EXPLORE #1:</u></b></p> <p>Distribute “Natural Bird Beaks and Food Sources” handout. Tell students that the beak shapes are illustrated in the left column and the corresponding food sources are in the right column. Have students use “Accountable Talk” (AT) stems written on the board (Teacher’s Preparation):</p> <ul style="list-style-type: none"> <li>▶ <i>What do you observe about these bird beaks?</i> Student response “I observe...”</li> <li>▶ <i>What is it about the bird’s beak that helps the bird to get its food?</i> “I notice that...”</li> <li>▶ <i>How are the beaks different?</i> “The beaks are different because...”</li> </ul> <p><b><u>EXPLORE #2:</u></b></p> <p>Discuss with students why a specific beak in the handout is best suited for the corresponding food item.</p> <p>Distribute a set of two bird pictures to each group.</p> <ul style="list-style-type: none"> <li>▶ <i>Describe the two beaks in your science notebooks.</i></li> <li>▶ <i>What might be the function of each of the beaks? Write this in your notebooks.</i></li> <li>▶ <i>Compare what you wrote to what your partner wrote.</i></li> <li>▶ <i>Which action verb might go with the beak of each bird? Write in your notebooks.</i></li> </ul> <p>Once students have completed their writings ask them to share their action verbs.</p> <p>List these on the board: (e.g., reach, pick-up, break, crack, spear, scoop, soak-up, tear, rip, grab, poke, etc.)</p> <ul style="list-style-type: none"> <li>▶ <i>What types of birds might perform (do) these actions?</i></li> </ul>	<p>Students observe the seven types of beaks and food sources. They focus and discuss with a partner the Accountable Talk questions using the stems:</p> <p>“I observe...”</p> <p>“I notice that...”</p> <p>“The beaks are different because...”</p> <p><b>ESR:</b> The shape of the beak is suited for the type of food that a bird eats.</p> <p>Groups follow directions.</p> <p><b>ESR:</b> Jay – picks-up; sparrow – cracks seeds; heron – spears; sandpiper – reaches or pokes (into sand); humming bird – soaks up (nectar)</p>	<p>The shape of the beak determines the kind of food a bird can consume.</p>

**EXPLORE #3:**

Tell students to listen to the instructions because they will turn to their partner and repeat the instructions.

- ▶ *You are going to participate in a “Bird Beak Activity” where you pretend to be birds in an ecosystem (or area). Each type of bird has a different shaped beak. There will be 6 types of beaks and 6 different food items.*
- ▶ *The purpose of the game is to discover which beak is best suited for which food item.*
- ▶ *You will be given a tool to use as your beak. You may only use the beak to pick up your food items. You will also be given a paper cup. This is the bird’s stomach. Hold the cup against your stomach and place the food in the cup. You may not use your fingers or the cup to help pick up food. The goal is to pick up as many food items as you can using only your beak.*
- ▶ *Please repeat these directions to a partner. Take turns.*
- ▶ *You may not run, push, or shove. The teacher will act as a HAWK and will “eat” - remove from the feeding area any BIRD which is bringing attention to itself by pushing, shoving, or not eating with its beak.*

Lead class to the outdoor area. (This can also be done on the classroom floor.)

Distribute “beaks.”

- ▶ *A group of you will be Group 1; Scissorsbills (distribute the scissors to 4 or 5 students); another group will be Group 2; Tweezerbills (distribute the tweezers); students in Group 3 are Spoonbills (spoons); students in Group 4 are Clothespinbills (clothespins); students in Group 5 are Tapebills (pencils with tape at the end); and students in Group 6 are Forkbills (forks).*

Distribute cups; one to each student.

- ▶ *These are “stomachs.”*

Students tell partners the directions.

Students get their beaks and cups for stomachs.

<p>▶ <i>When the whistle blows (or when I say “Go”) you may begin walking around and collecting food. Keep feeding until you hear the whistle blow again (or when I say “Stop”). Then freeze and listen for instructions.</i></p> <p>Blow the whistle. Students begin feeding. When all food items are picked up, blow the whistle again.</p> <p>▶ <i>We are going back to the classroom. Sit with your group (students that have the same beaks).</i></p> <p>Back in the classroom distribute a “Beak and Food Chart” to each student.</p> <p>▶ <i>In the top chart, each of you will count and record the number of food items you collected. In the bottom chart (Group Chart), you will total the food collected from your entire group.</i></p> <p>When students finish counting and recording their data on their group charts, have groups report their results. Teacher writes data on an overhead transparency, “Simulated Bird Beaks and Food Class Chart.”</p>	<p>Students use their beaks to pickup the food.</p>	
<p><b><u>EXPLAIN:</u></b></p> <p>Ask:</p> <p>▶ <i>According to the data, what type of food does each beak pick up the best?</i></p> <p>▶ <i>Which beak was able to pick up more than one type of food?</i></p> <p>Decide on a key question(s) to have students write about: Questions:</p> <p>▶ <i>Why are all bird beaks not the same? Give an example.</i></p> <p>▶ <i>Why would it be useful for a bird to be able to pick up more than one type of food?</i></p> <p>▶ <i>Why is the shape of a bird’s beak important to the bird’s ability to get food?</i></p> <p>▶ <i>What might a bird be able to do if a certain type of food becomes unavailable?</i></p> <p>Discuss as a class:</p> <p>▶ <i>Did any group of birds compete for the</i></p>	<p><b>ESR:</b> Spoonbills – marbles; Tweezerbills – toothpicks; Tapebills –paper; Clothespinbills – pipe cleaners, etc.</p> <p><b>ESR:</b> Tweezerbill; Clothespinbill</p> <p>Students write and respond to key question(s).</p>	<p>The type and amount of food available affects the survival of birds (and other animals).</p>

<p><i>same food? If so, which group ended up with more food? Which had the least amount of food? Why do you think this happened?</i></p>		
<p><b><u>EXTEND:</u></b></p> <p><b>Game #2:</b> Eliminate one source of food and play the game again. This will show competition among groups of birds and which ones seem more successful in getting specific food.</p> <p><b>Game #3:</b> Have all but one group select only <b>one</b> type of food to collect. The one group may collect all types of food. Was there competition among groups? How well did the group that could collect all types of food do (in terms of number of food items collected) compared to other groups? Did the type of beak this group have, affect how many different food sources it was able to pick up?</p> <p>Have students select a bird picture from a book and predict what the bird would eat. Choose some “Accountable Talk” stems to talk about the bird and its ability to get and consume the food.</p> <p>Focus on the following concept: The shape of a bird’s beak determines the kind of food a bird can consume, which indicates the feeding level of the bird and the type of ecosystem the bird inhabits. Have students conduct research and develop a food web to include some birds. Identify birds that are herbivores, carnivores, and omnivores (note that many birds that eat mostly seed will also eat insects and other invertebrates).</p>		

**Input Question:** What do you observe about these bird beaks? (Explore #1)


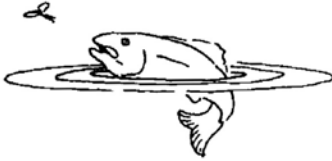












**Process Question:** Compare what you wrote to what your partner wrote. (Explore #2)

**Output Question:** Why would it be useful for a bird to be able to pick up more than one type of food? (Explain)



STUDENT HANDOUT

**Natural Bird Beaks and Food Sources**

STUDENT HANDOUT  
**Beak and Food Chart**

Type of Beak \_\_\_\_\_

Game Number	Number of Items Collected						
	Marbles	Pipe cleaners	Tooth-picks	Pencils	Paper clips	Paper	Total Items
1							
2							

**GROUP CHART**

Names of Students \_\_\_\_\_

\_\_\_\_\_

Type of Beak \_\_\_\_\_

Game Number	Number of Items Collected						
	Marbles	Pipe cleaners	Tooth-picks	Pencils	Paper clips	Paper	Total Items
1							
2							

TRANSPARENCY

**Simulated Bird Beaks and Food Class Chart**

**GAME 1**

<b>Beak Type</b>	<b>Number of Food Items Collected</b>						
	Total Items	Marbles	Pipe cleaners	Tooth-picks	Pencils	Paper clips	Paper
Scissorbeaks							
Tweezerbeaks							
Spoonbeaks							
Clothespinbeaks							
Forkbeaks							
Tapebeaks							
Optional beaks							

**GAME 2**

<b>Beak Type</b>	<b>Number of Food Items Collected</b>						
	Total Items	Marbles	Pipe cleaners	Tooth-picks	Pencils	Paper clips	Paper
Scissorbeaks							
Tweezerbeaks							
Spoonbeaks							
Clothespinbeaks							
Forkbeaks							
Tapebeaks							
Optional beaks							