

**Exploring Bird Beaks**  
Teacher's Instructions  
Grades 4 - 8

**Synopsis:**

In this activity students will explore how different birds' beaks are shaped differently. The lesson will be introduced by reminding the students that not all animals feed in the same way. They will then progress to the activity and explore different beak types by picking up different types of food with different tools.

**Learning Goals:**

- Students will understand that different animals feed in different ways.
- Students will be able to connect the different tools they are using to real bird species.
- Students will understand that birds' diets are limited by their beaks.
- Students will connect the differences in beak type to resource partitioning, understanding that food resources are divided up by size.

**Recommended grades:** 4th through 8th

**Estimated time required:**

- a) Prep time: 20 Minutes
- b) Class time: 60 Minutes

**Key Concepts and Terms**

- **Structure and Function:** In science the structure of something determines its function, this concept can be applied to everything from biological enzymes to skeletal structure of animals. By investigating structure you can make conclusions about the function of many things in science. In this activity the structure of a bird's beak determines what kind of food it can eat.
- **Resource Partitioning:** In nature if every animal could eat the same things there would be many fewer animals; instead resources in the environment are shared because each animal eats a different type or size of prey. With birds, prey is divided by both type and size so there are many species of birds, with beaks that all look a little different.

**Materials Needed Per 20 students:**

- "Foods"
  - 80 1.5 inch bits of string (worms)
  - 1 bag kidney beans (beetles)
  - 1 bag rice (ants)
  - 1 liter water (flower nectar)

- “Beaks”
  - 5 sets chopsticks
  - 5 sets tweezers
  - 20 spoons
  - 20 plastic pipette droppers
- Other materials
  - 32 cups for “food”
  - 40 cups for students
  - rulers
  - stopwatch
  - worksheets

**Estimated Cost:** <\$20

**Lesson:**

Stage 1: Hook

Introduce the lesson by asking students if they have pets at home.

Ask what kinds of pets they have, if they know how these pets eat and drink. Why do animals eat and drink differently than us?

Mini activity about all animals drinking method:

- Each student will be provided with two cups, one with water and one without.
- Each student should be given a spoon, a dropper, or a sponge and they will have a minute to try and move as much water from one cup to the other as a race with the sponge, then with the spoon and dropper. They can record their results on worksheet #1.
- Ask them what animals they think each tool represents.

(Sponge = people, spoon = animals that lap, dropper = hummingbird or butterfly)

Stage 2: Introduce concept of differing bird beaks

Assess prior knowledge by asking these questions of the class

- Does anyone have a pet bird? What does it eat?
- What do you think eagles and hawks eat?
- What about the birds that go to your bird feeder?
- How do bird beaks allows birds to partition their resources between species?
- What would happen if all bird beaks were alike? What are the ecosystem implications?

Explain that birds have different beaks so that they can eat different things, and that we are doing an activity to test different bird beaks out on some different foods.

### Stage 3: Activity

Explain that everyone is going to have the chance to test every tool on every type of food, and we are going to collect data on how well each beak type works on each type of food.

- Hand out the data sheet (Worksheet #2) and explain that each square will be used to record how much of that food could be collected with each beak type.
- Remind the students to wait for further instructions before filling in their data sheets because food collection will be timed for 45 seconds to keep the measurements consistent.
- Break students into 4 groups, each at a separate table

Distribute to each group:

- tweezers, chopsticks, spoons, or droppers (students will likely still have their spoons and droppers from the mini-activity).
- 2 cups of water
- 2 cups with rice
- 2 cups with beans
- 2 cups with string pieces
- 2 empty cups for each student

Procedure:

1. Set the timer for 45 seconds
2. Have students move their first food type into their empty cup with their first tool. They should move only one discrete item at a time and use only one hand.
3. Have them count how many items they moved and write this down on their data sheet.
4. Return the first food to its original cup and repeat steps two and three for the rest of the food types: worms (string), beetles (kidney beans), ants (rice), and nectar (water). Water measurements will be taken in cm rather than number, and water should be moved into the second empty cup so that the rice and beans don't get wet and can be reused.

### Stage 4: Data review

Have the students circle which tool was the best at gathering each food item. For example, which tool was best at moving water? Have them raise their hands for some of the different likely combinations. Did many students get the same results with their different tools, why might results have differed between students?

Next have students use their data to determine which food type the different birds would eat in this ecosystem. They may have different answers but they should consider competition for resources in this response.

#### Stage 5: Discussion

Review the important points of the activity.

- What would happen if there was no nectar?
- What do you think the chopsticks beak bird will eat (if they didn't win any food type)?
- Did any tools tie for any food types?
- How would these foods be split up between these beak types in nature?

Have the students match the beak tools to real bird species on Worksheet #3). If time go over the answers and talk a little about each of the birds (where they live, what they eat in real life, etc.)

#### Spoon → Pelican

Pelicans live near the ocean, they use their large spoon like beak to scoop up water with fish or other small animals in it, they then strain out the water and can eat the fish caught in their beak. This is similar to the spoon, they can scoop up a lot of stuff with their beak if the water has fish in it. These birds are not as good at picking smaller animals out of the ground or plants.

#### Tweezers → Robin

Robins pick worms and other bugs out of the ground, their beaks are good at probing the ground and picking up small things. They are unable to eat a lot of bugs at one time and must pick things up individually.

#### Dropper → Hummingbird

Humming birds feed on the nectar of flowers. Their long slender beaks allow them to drink from the heart of a narrow flower. Hummingbirds need a lot of energy to survive because their beaks beat so fast.

#### Chopsticks → Woodpecker

Woodpeckers drill into rotten logs and grab the bugs that are living in the log. Sometimes they have to make these holes very deep so they need long straight beaks that can get into the back of a hole and grab bugs, these are like our chop sticks. They also have beaks that are strong enough to drill into trees without breaking.

## Drinking Methods (WS#1)

You will have one minute to move as much water as possible from one cup to the other using each of your three tools in individual trials. Write down the height of the water in your cup after one minute.

Tool	Amount of Water
Cotton Ball	
Spoon	
Dropper	

Match the tool with the animal you think it represents.

- |              |                |
|--------------|----------------|
| a. Human     | 1) Dropper     |
| b. Dog       | 2) Spoon       |
| c. Butterfly | 3) Cotton ball |

Data Sheet (WS#2)

	Number of Beetles (beans)	Number of Ants (rice)	Number of Worms (string)	Centimeters of Nectar (water)
Tweezers				
Chopsticks				
Spoon				
Dropper				

# Matching Game: Beaks and Tools (WS#3)

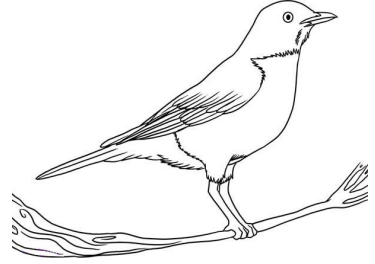
## Instructions:

Match the bird to the tool that you think represents its beak. Write the letter of the bird next to the picture of the tools we used in class.

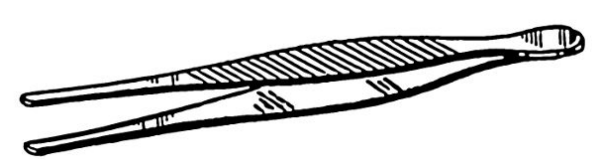
\_\_\_\_\_ Dropper



A. Robin



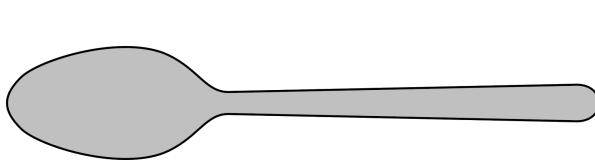
\_\_\_\_\_ Tweezers



B. Hummingbird



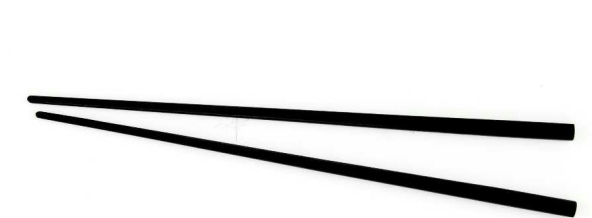
\_\_\_\_\_ Spoon



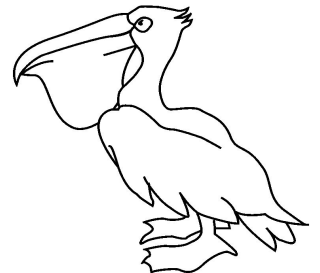
C. Woodpecker



\_\_\_\_\_ Chopsticks



D. Pelican



## Exploring Bird Beaks Student Instructions

### Warm-up Activity:

1. Try moving water from one cup into another using a spoon for one minute
2. Repeat with a dropper for one minute
3. Repeat with a cotton ball
4. On your worksheet record the height of water that each tool was able to move
5. On your worksheet match the tool to the animal it might represent.

### Bird Beaks Activity:

1. Practice using the chopsticks and tweezers for a few minutes
2. You have 45 seconds to move as much food as you can into your empty cup for each of the 16 possible food and tool combinations in 16 individual trials.
3. Once you have filled out your whole data sheet circle which tool was best at moving each food.
4. On the back of your worksheet predict which combinations would be most likely in nature and explain your decision based on competition and resource partitioning.
5. On your worksheet match the tools to the birds that they represent.