

# The Best Beak for the Job

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<b>Strand</b>	Living Systems
<b>Topic</b>	Investigating ecosystems
<b>Primary SOL</b>	4.5 The student will investigate and understand how plants and animals, including humans, in an ecosystem interact with one another and with the nonliving components in the ecosystem. Key concepts include a) plant and animal adaptations.
<b>Related SOL</b>	4.1 The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which b) objects or events are classified and arranged according to characteristics or properties; i) data are collected, recorded, analyzed, and displayed using bar and basic line graphs; l) models are constructed to clarify explanations, demonstrate relationships, and solve needs.

## Background Information

Organisms have structures uniquely adapted for their particular needs. These structural adaptations affect the entire species of organisms and usually occur gradually over many generations. Although we generally use animals as examples for adaptations, all organisms have adaptations that aid their survival.

Structural adaptations, such as teeth, beaks, claws, and body covering and coloring, are physical or functional characteristics that help animals meet their needs. These adaptations allow animals to find and eat food, hide from predators, surprise prey, flee, and maintain body heat. Plant structural adaptations include thorns, bark, leaf shape and size, root type, tendrils, and the size and shape of seeds. Small leaves have less surface area reducing the amount of moisture loss. Some leaves have pointed tips which allow water to funnel off of them. Cacti have shallow roots which allow them to quickly absorb water when it rains. Tendrils provide vines the ability to support themselves as they climb. Seeds are adapted to disperse in various ways including wind, water, and by animals.

Behavioral adaptations help individual animals, groups of animals, and some plants meet their needs. These adaptations are the things that organisms do to survive, such as migrate, hibernate, and hunt in packs. Plants behavioral adaptations include many desert plants which only bloom at night while pollinators are active. The leaves on mimosas are very sensitive to moisture loss and will close when touched. Vines in the rainforest climb up trees to reach sunlight.

Living things adapt to a specific environment over a long period of time and many generations. If the environment changes, living things must change to survive or migrate or move to an environment similar to the one that had changes. Some individuals in a species can make behavioral changes that allow them to survive when conditions in the environment changes.

Some species may have the ability to adapt their behavior whereas other species may not have been able to make the necessary adaptations and populations have dwindled.

### **Materials**

- Pictures of birds with different beaks to be found on the Internet or from nature magazines

Per group:

- Tweezers
- Clothespins
- Spoons
- Straws
- Two small flat stones
- Chopsticks
- Cooked spaghetti
- Uncooked rice
- Raisins
- Birdseed
- Plastic worms
- Cup
- Water
- Copies of the attached The Best Beak for the Job instruction sheet per group
- Copies of the attached The Best Beak for the Job data sheet per student

### **Vocabulary**

*ecosystem, environment, hibernation, behavioral adaptation, structural adaptation*

### **Student/Teacher Actions (what students and teachers should be doing to facilitate learning)**

#### *Introduction*

1. Ask the class if they have ever noticed that different species of birds have differently shaped beaks. Show the pictures of birds with different types of beaks, and have students speculate on the task that each type of beak performs.
2. Tell the students that they will be investigating how birds' beaks are adapted to perform different jobs.

#### *Procedure*

1. Divide the class into small groups of four to five students.
2. Give each group one set of "beaks" (tweezers, clothespins, spoons, straws, flat stones, or chopsticks), one set of "bird food" (cooked spaghetti, uncooked rice, raisins, birdseed, plastic worms, or cup of water), a copy of the attached The Best Beak for the Job instruction sheet for the group and copies of the attached The Best Beak for the Job data sheet for each student.
3. Read The Best Beak for the Job instruction sheet with the students, ask if they have any questions.

4. Have each student complete the activity by picking two beaks to test and record. Allow students 10 minutes or so to try to “eat” each food with each of their two beaks.

### Conclusion

1. When all students have completed the activity, have each group share their observations with the class.
2. Ask the students the following questions to stimulate class discussion:
  - How do these beaks compare to the sharp teeth of meat-eating animals?
  - Why might a liquid-sipping beak like the straw gradually change to a beak that not only sips but can also chew?

### Assessment

- **Questions**
  - What does a bird with a skinny, long bird beak allow it to do?
  - What type of beak is best for tearing meat?
- **Journal/writing prompts**
  - What beak would you prefer and why?
- **Other**
  - Have the students design an animal that can walk in shallow pond water, eat bugs in the mud at the bottom of the pond, be camouflaged from its predators, and climb trees if in danger. Let each student draw and color his/her own illustration of the animal, as well as describe in a well-organized paragraph how the animal accomplishes each of the tasks required.

### Extensions and Connections (for all students)

- Have the students do a similar activity in which they are comparing other physical features of animals, such as different birds’ feet (wading, perching, catching prey) or the legs of various land animals.

### Strategies for Differentiation

- Create a sort on the board where the students come up to the board and move a beak to the animal that it is able to eat.
- Direct students to draw illustrations of beaks and the types of food for which the beak is best suited.
- To guide student observations, direct students to construct graphs that compare beak types and number of food types eaten. Guiding questions: For each food type, which beak was most successful according to the data? Why is this so? Which bird or birds are least adapted for feeding according to your data? Why is this so?

# The Best Beak for the Job

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Directions: Birds have different types of beaks that help them eat the foods they need. Suppose that the tools in this activity are different beaks. Which beak would be the best adapted to eat each food?

## Materials needed:

### Beaks

Chopsticks

Drinking straws

Tweezers

Clothespin

Spoons

Two small flat stones

### Bird Food

Plastic worms

Cooked spaghetti

Rice

Raisins

Birdseed

Water in a cup

## Procedure

1. Observe the different forms of “beaks” and “bird foods.” Predict which beak is best adapted for picking up each food.
2. Select two “beaks,” and test out your predictions by trying to pick up the food with the chosen “beaks.”
3. Complete the chart on the accompanying data sheet. In the column marked “Observation,” write a sentence explaining why that “beak” is especially adapted for that food.
4. After completing the eating activity, complete the final two activities on your data sheet.

# The Best Beak for the Job

## Data Sheet

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Food	Best "Beak"	Observation
Plastic worms		
Cooked spaghetti		
Rice		
Raisins		
Birdseed		
Water in a cup		

Study your chart. Which beak is best adapted for

picking up insects? \_\_\_\_\_

crushing birdseed? \_\_\_\_\_

digging up worms? \_\_\_\_\_

sipping water? \_\_\_\_\_

scooping up mud? \_\_\_\_\_

ripping meat? \_\_\_\_\_

In the box at right, draw two actual bird-beak shapes that match the two "beaks" you chose.

