

STEAM Subject: Ecology
Lab: Bird Beaks

Grades: 3-8

Learning objective:

Students will learn how different animals have different adaptations and can use more resources in an environment. Students will explore this idea in an activity that demonstrates how birds have varying beak shapes to eat different foods.

ENGAGE:

Ask students the following questions:

- Why do animals in the same environment need to eat different foods?
 - *Not enough of the same food for all animals, less competition*
- What are adaptations? Give some examples of how different animals have different adaptations and how they help the animals eat different foods.
 - **Adaptations** help an animal survive in its environment.

Examples:

1. *wolves have **sharp teeth** that help them kill and eat other animals.*
 2. *flamingos have **long legs** that let them stand in deeper water to eat the shrimp found there.*
 3. *arctic foxes **change the color of their fur** to better blend in with the environment during different seasons*
- What would happen if all the animals in an environment ate the same food?

EXPLORE:

Have you heard about Darwin's Finches?

Charles Darwin, known as the Father of Evolution, was a well-known **naturalist**. In the 1830s, he joined a survey expedition on the *HMS Beagle* and explored the Galapagos Islands. There, he observed twelve different species of finches, noting that their differently sized beaks helped them eat different foods. Birds in other habitats also exhibit similar differences in their beak sizes.

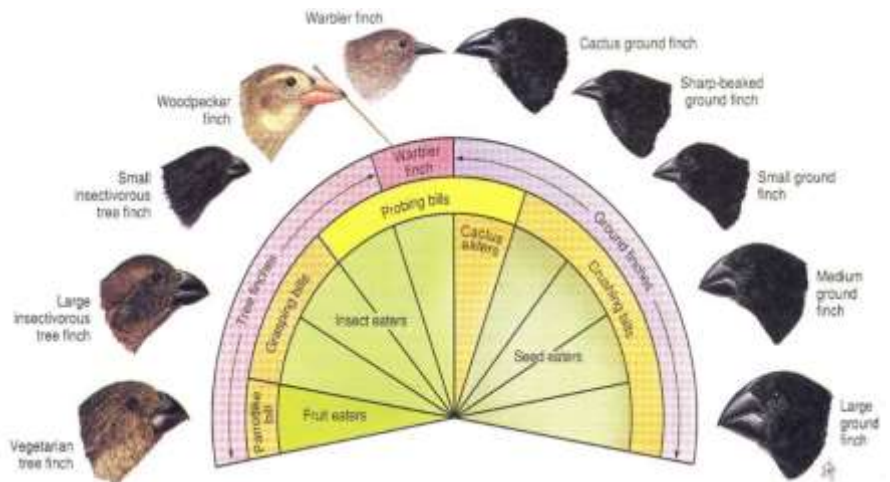


Image credit and more information about Charles Darwin and the Galapagos Islands found here:
<https://www.galapagosislands.com/nature/wildlife/>

Darwin's Finches Activity:

Students will participate in an activity where they will model the behavior of a group of birds with different beaks and eat food from the same area (habitat).

Materials needed per student:

- 1 small bin (plastic or cardboard shoebox works well)
- Stopwatch
- Uncooked rice (approximately ¼ cup)
- Dry beans (approximately ½ cup)
- A handful of packing peanuts or cotton balls
- A handful of paper strips (you can cut these yourself or use shredded paper)
- Spoon
- Fork
- Clothespin
- Toothpick
- Cups or bowls



Directions:

1. Pour uncooked rice, dry beans, packing peanuts/cotton balls, and paper strips into the bin.
2. Each student will take one beak (either the spoon, fork, clothespin, or toothpick) and one cup/bowl (their “stomach”). *If more than one student, have them rotate with different beaks.*
3. Instruct students to pick up as much food (rice, beans, packing peanuts/cotton balls, paper strips) as they can using only their beak and to place the food in their “stomach” (their respective cups/bowls).
4. Time each round to last 30 seconds. After, have students count their pieces of food and record their catches (results) in a table according to their respective beaks (example below).
5. Replace “food” in bin for another round, and repeat rounds until students have used each type of beak.

Table of results

Birds Beaks	Rice	Beans	Packing Peanuts/Cotton Balls	Paper Strips
Spoon				
Fork				
Toothpick				
Clothespin				

Discussion:

Ask students if they found it easier to pick up some foods than others. Why might this be the case?

Did the students find that they focused more on catching certain foods because of their beaks? What might happen if they all had the same type of beak?

Optional Activity:

Give all students the same type of beak. If only one student is present, have the parent/instructor participate. Conduct another round and tally the results.

Did all of the students try to eat the same foods? Was it harder to get food after a while? What if they switch to different beaks in the middle of the round?

Explain how some species started out as a single species, then became multiple different species through **natural selection** — such as how Darwin’s finches originated as one species of finch from South America and became twelve different species on the Galapagos Islands.

EXPLAIN:

Watch video about animal adaptations and Darwin’s Finches:

- Animal adaptations: <https://www.youtube.com/watch?v=a85IHqFhyw4>
- Darwin’s Finches (with information on natural selection): <https://www.youtube.com/watch?v=s64Y8sVYfFY>

Review Science vocabulary:

- **Adaptation:** a feature that helps a species survive in its environment in a specific way. It can be something inside their body, on their body or a specific behavior.
- **Natural selection:** the process of how organisms with better adaptations for their environment tend to survive and produce offspring, thereby continuing their species.

EVALUATE:

Have students think about the adaptations of the organisms they see around them. How do these adaptations help the organisms thrive? Think beyond animals and how they eat! Living organisms have different adaptations to survive in different habitats all around the world (in water, land, and air!). What are some of your adaptations? What do they help you do?

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