

Education and Research: Testing Hypotheses

# Using your Bird Brain to Eat Like a Bird

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Students will research shorebird beak adaptations and using a variety of materials to design a beak appropriate to the type of food that they eat.

Questions: What birds are commonly found on our beaches? What do the birds eat? How are the beak designed to assist them in eating? How can they use common materials to design a beak for a particular bird? How can they redesign their beak to be more efficient? What worked, what didn't, what materials would you have liked to have?

Keywords: adaptation, beak, shorebird, habitat, diet, design, engineering, species

Standards NGSS

# 3-LS3 HEREDITY: INHERITANCE AND VARIATION OF TRAITS

Students who demonstrate understanding can:

B- alyze and interpret data to provide evidence that plants and animals have traits inherited from parents d that variation of these traits exists in a group of similar organisms. [Clarification Statement: Patterns
a the similarities and differences in traits shared between offspring and their parents, or among siblings nphasis is on organisms other than humans.] [Assessment Boundary: Assessment does not include netic mechanisms of inheritance and prediction of traits. Assessment is limited to non-human example.
B- is evidence to support the explanation that traits can be influenced by the environment. [Clarification 53- atement: Examples of the environment affecting a trait could include normally tall plants grown with 2. sufficient water are stunted; and, a pet dog that is given too much food and little exercise may become erweight.]

#### **Objectives:**

Students will become familiar with shorebirds commonly found on the Gulf Coast. Students will use research skills to learn about beak adaptations that allow these birds to be successful in their environment.

Students will use the engineering design process to create beaks that will allow them to "eat" like their chosen shorebird.

Students will construct a simple bar graph to record their data.

#### Materials:

5 bird identification name tag cards/group.

Timer

Dry erase markers

One large bowl/group.

I piece of Graph paper/student

1 pencil/student

1 Cup that represents stomach/student

1 Bar graph handout/student (laminate to be used again)

## Bird food:

Edible food: goldfish crackers, oyster soup crackers, swedish fish, gummy worms, sour patch fish

Alternate "non-edible" food: cup rubber bands, foam paper fish, compressed sponge fish, marbles, dried beans

**Beak tools**: clothespins, tweezers, spoons, forks, skewers, scissors, pipe cleaners, tape, pipettes, nutcrackers, tongs, chopsticks, string, paper, paperboard, cardstock, etc...

## Procedure:

- 1. Share with students a variety of pictures of gulf coast shore birds.
- 2. Discuss birds physical characteristics.
- 3. Show a variety of different types of prey that the birds eat.
- 4. Show a picture of a snowy plover and draw attention to the beak. Ask? What kind of food do you think it will eat and why?
- 5. Continue with different pictures and different prey. Lead students to the observation that the bird's beak is suited to the type of food it eats.
- 6. Define adaptation.
- 7. Tell students that they will become a shorebird today and being a hungry shorebird they will need to find something to eat.
- 8. Show students the 5 name cards: Osprey, Snowy Plover, Pelican, Black Skimmer, and Least Tern
- Assign students a bird card and have them do an internet search on the types of food their bird eats and the types of adaptation the bird has to be a successful hunter.
- 10. Discuss with students the types of beak their bird has. Ask if these beaks remind them of things that they might see at home or school.



- 11. Ask what does a pelican's beak remind you of? Why do you think his beak looks that way? What does the beak have to do with the type of food he eats?
- 12. Why doesn't a Snowy Plover have the same type of beak an Osprey does?
- 13. Encourage students to use the word adaptation in their discussions.
- 14. Introduce students to the large bowls that have a variety of edible or nonedible food.
- 15. Discuss what the items might represent, ie. a rubber band might represent an aquatic worm.
- 16. Ask what type of food your bird might want from the bowl?
- 17. Tell students they will have the opportunity to find out.
- 18. Show students the beak tools and tell them they will have 5 minutes to use the materials available to create a beak that will successfully get food for their bird.
- 19. Explain that students will be divided into groups with one of each type of bird in the group and one bowl of bird food.
- 20. At the signal students will have 1 minute to collect food using their tool only (no hands).
- 21. Food collected must be placed in their cup stomach.
- 22. When time is up, distribute bar graphs and have students sort, count and record their catch.
- 23. Discuss with students the amount of food each bird caught: What did you catch the most of? What did you catch the least of? Why do you think that is?
- 24. How well did your beak work?
- 25. In the engineering process we talk about testing and redesigning to improve your prototype.
- 26. Tell students they will now have a chance to redesign their beaks in order to catch more prey.
- 27. Allow 10 minutes for redesign and repeat steps 20 24.
- 28. Ask did you catch more fish, why or why not? Did your design improve your catch?
- 29. Conclude by discussing the importance of adaptation to the survival of the species.
- 30. What adaptations do we have to help us survive.
- 31. If we were to do this again what materials do you wish you had to improve your design.

Writing prompt:

What man made ptations have we created in order to improve our lives (ie. bike helmets to protect your head, shoes to protect).

