Bird Beak Adaptation Activity

Teacher Directions
Grades 2-5

Overview

Lesson products for Shorebird Scientists will:

- ***Embrace the practices of science and engineering by:***

  Asking questions (for science) and defining problems (for engineering)
  Developing and using models
  Planning and carrying out investigations
  Analyzing and interpreting data
  Using math and computational thinking
  Engaging in an argument stemming from evidence
  Obtaining, evaluating, and communicating information

- ***Recommend some literacy (ELA) connections***
- ***Provide "Follow-up" activities***

Overview

Desired Student Outcomes:

• Students will understand that animals (birds) have external structures that function to support survival
• Students will examine the relationship between a bird's beak and its ability to find food and survive in a given environment.

NGSS Performance Expectations

NGSS Disciplinary Core Idea – 3-LS4-3; 4-LS1-1
NGSS Science and Engineering Practices – Engaging in Argument from Evidence, Planning and Carrying Out Investigations, Analyzing and Interpreting Data, Constructing Explanations and Designing Solutions
NGSS Cross Cutting Concepts – Cause and Effect,Systems and System Models

ELA Connections: W.3.8; SL.3.1 , W.4.8; SL.4.1

Teacher Directions

How much food can you collect? Activity:

- We are going to do an activity to explore how a bird's beak shape can help it catch its food.

Materials Needed:

- Student worksheets and pencil
- Three bird "beaks" Tweezers (Piping Plover), Tongs (Great Egret) Strainer (Black Skimmer)
- Three bird "foods" Rubber bands in sand (marine worms - Piping Plover); Gems or large beads in mud (frogs - Great Egret); (Cut sponge in water (Herring - Black Skimmer)
- Tray or plate for sand and "worms", container with mud for "frogs"), container with water for "Herring"
- "Stomach" container
- Timer or stopwatch

Setup:

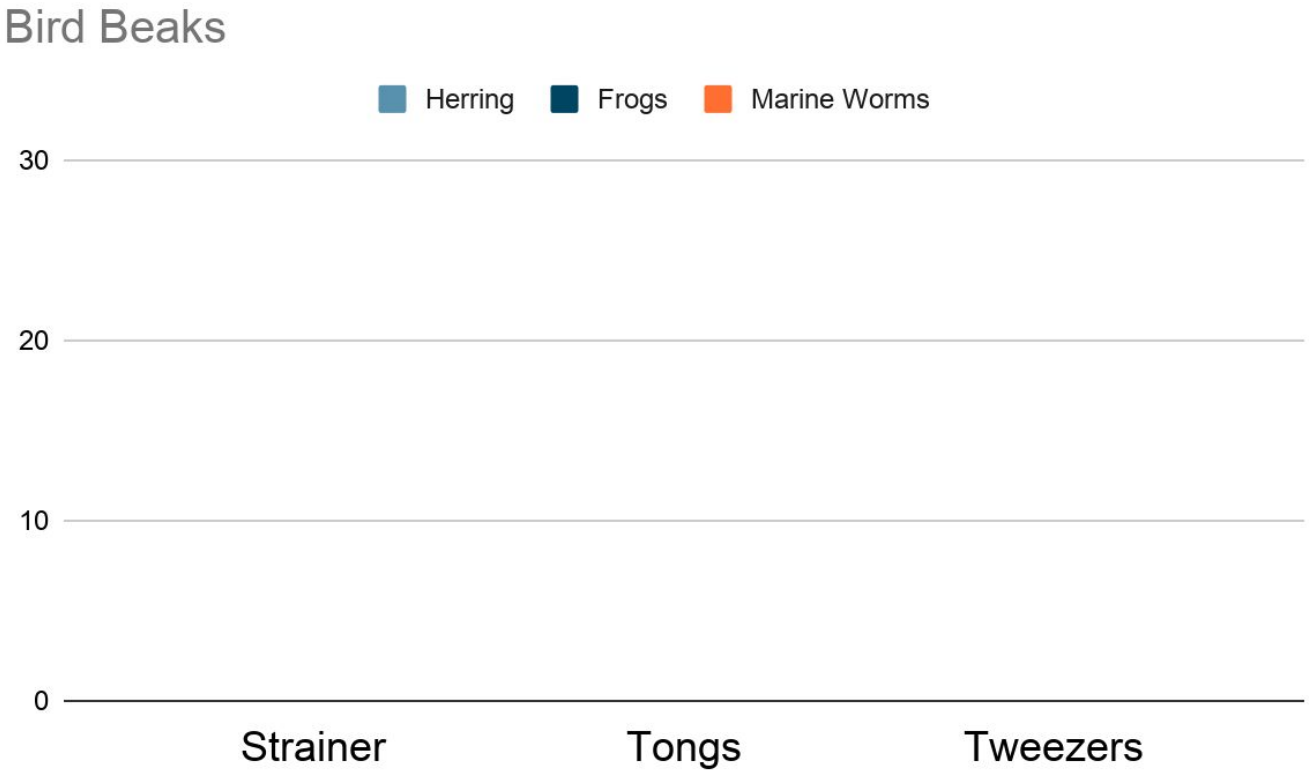
- This activity can be done with individually or in small groups depending on classroom needs. If being done individually each student will need a set of materials and a flat surface. If activity is being done in small groups set up can include one or two sets of each "beak" and "food" depending on class size and students can rotate through stations (Great Egret station, Black Skimmer station and Piping Plover station).

Teacher Directions

How much food can you collect? Activity:

- Have students start with their first bird and “food”. Prediction! - Have students predict which tool they think will work the best for this bird. Why do they think that tool will work the best? What tool looks most similar to the beak of the bird?
- Explain that they will have 30 seconds to collect as much food as they can using their “beaks” and putting it into their “stomach” cups.
- Remind students that they can only use their beaks as birds do not have hands!
- Have students start with their first beak and time them for 30 seconds.
- After their 30 seconds are up have students count how many pieces of food they were able to collect and mark it on their worksheet.
- Depending on time, students can share out how many pieces they collected and if collecting the food was challenging or easy.
- Have students add their food back from their “stomach” and repeat the activity with the remaining two beaks.
- After students have tried all three “beaks” have them share which beak worked the best in collecting the food.
- Repeat above steps for remaining two bird species.
- Have students share what beaks they think work the best for which bird and why.

Class Graph


Bird Beaks
Herring
Frogs
Marine Worms
30
20
10
0
Strainer
Tongs
Tweezers

Teacher Directions

Materials Needed:

- Student worksheets and pencil
- “Stomach” container
- Mix of two different food types. One is “fish” and one is “plastic” (this can be two different colored gems or beads, cut-up sponge etc) in water container
- Strainer for a “beak”
- Timer or stopwatch

Setup:

- Each student will need one set of materials. Both “food” types should be placed in water container. At the beginning, students should be told that all of it is “food”

Teacher Directions

How much food can you collect? Part 2 Activity:

- Now students will be pretending they are hungry Double-crested Cormorants.
- Mixed in with their food are bits of plastic. **Students will not know and will be told it is all food.**
- Students will then use their beaks to collect as much food as they can in the allotted time. (around 30 seconds)
- After time is up they will be told which is food and which is plastic.
- Students “empty” their stomachs of food but keep the plastic.
- They now have another timed trial of eating food (if they accidentally scoop up plastic that still stays in) until their cup is full. Reveal why this is later.
- Ask what they think happens to the plastic in the bird's stomach. Why didn’t we take it out with the rest of the food?
- This is because birds cannot digest the plastic so it stays in their stomachs and can make them feel like they are full. They will continue thinking they are full until they starve.

Class Graph