

Title of Lesson: Bird Beak Adaptation Experiment

Length of Lesson: 20 - 30 Mins

Description of Class: Why do ducks have flat beaks? What's the point of a hummingbird's long bill? Bird beaks are strongly shaped by the food they eat! But don't take our word for it, join us in a series of hands-on experiments where we will determine what beaks are best shaped for what job, and why.

Curriculum Content:

Grade 1: Living things have features and behaviours that help them survive in their environment

Grade 1: Behavioral adaptations of animals in the local environment

Grade 3: Biodiversity in the local environment

Grade 4: All living things sense and respond to their environment

Curricular Competencies

Make predictions based on prior knowledge

Safely manipulate materials to test ideas and predictions

Make and record simple measurements using informal or non-standard methods

Classify data and information using drawings, pictographs and provided tables

Compare observations with predictions through discussion

Make simple inferences based on their results and prior knowledge

Overview

1. Scheduled Activities:

- a. Discuss local bird species, where they live and what they eat
- b. Explain to the students what an adaptation is and how birds are adapted.
- c. Students rotate through 4 stations using the scientific method to determine what style of bird beak is best for food being eaten
- d. Discuss what beaks worked best in each situation and why

3. Materials and Supplies:

- a. Sunflower seeds
- b. Pompoms
- c. Plastic bugs
- d. Sand or soil
- e. Sponge - cut into small peices
- f. Trays and bowls
- g. Utensils (spatula, tongs, plyers, chopsticks, slotted serving spoon ect.)
- h. Worksheets
- i. Pencils

Set up: (20 minutes)

Set up 4 experiment stations around a room (allow for adequate space between experiments). Each one will represent a different bird species and its food source. At each station, the students will test



3 different utensils to collect the “food source” . These utensils will represent different styles of bird beaks. At each experiment, one utensil should work the best.

1. Station 1: Bugs in the Dirt. This experiment mimicks how a bird, such a robin uses its beak to eat bugs hidden in the soil. Fill a bin with sand or soil and mix in plastic bug toys for the students to find. Lay out 3 sets of utensil, 1 that will work well to collect the bugs and 2 that may not. For example, large tweezers, a spatula and a baster.
2. Station 2: Pinecone seeds. This experiment mimicks how a bird, such as a pine grosbeak is able to eat seeds. Fill a bowl with sunflower seeds. Lay out 3 utensils that the students must use to break open the seeds, 1 that will work well and 2 that may not. For example, a set of pliers, chopsticks and a slotted spoon.
3. Station 3: Fish in the Pond. This experiment represents ducks in a pond. Fill a bow with water and small pieces of a sponge, this represents plants and algae floating in the pond. Lay out 3 utensils, 1 that will work well and 2 that may not. For example, a slotted serving spoon, baster and a flipper.
4. Station 4: Flycatcher. This experiment represents birds that catch flying insects. Throw pompoms in the air to represent flying insects. The student will try 3 different utensils to try to catch the “flying insects” in the air. Utensils could include large tweezers, tongs and a paper “fortune teller”.
5. Ensure that the water station has towels under it and place a bowl at each station for the students to place the “food” as they collect it.
6. Have a timer ready and data sheets. Allow each student to record their own data.

Methods:

4 stations work best (3 minutes per station). Favourites are flycatcher, Bugs in the Dirt, Pine Cone Seeds and In the Pond. *(This station is very short on time so keep your discussions brief)*

1. Adaptations

A skill, or trait or behavior can be an adaptation: For example – having a thick fur coat is an adaptation that allows some animals to survive the winter. Can you think of other examples (Camouflage...)? Discuss how different species of birds eat different food sources and they need to have different beaks to do so.

2. Experiments

Explain the challenge to the children and give each one a Go over steps of how to use each station and how to fill out the data sheet. Have the children make predictions on what utensils will be best for each “food source”.

- Fish in the Pond - use each of the utensils to collect as many fish and plants as you can in 1 minute. Count and record the total.
- Bugs in Dirt - use each of the utensils to collect as many bugs from the dirt as possible in 1 minute. Count and record the total.
- Pine Cone seeds - use each of the utensils to collect as many seeds as you can in 1 minute. Count and record the total.
- Fly Catcher - use each of the utensils to collect as many flies as you can in 1 minute. Count and record the total.

Use one utensil at a time. When the 1 minute time runs out switch to the next utensil. After the 3 minutes is up and the 3 utensils have been used, clean up the stations and move to the next.

Explain to the students that they need to leave the station the way they found it before moving on to the next. The program leader will use the timer and announce “GO” at the start of each minute and tell the students when to switch to the next utensil and when to move to the next station.

3. Results

If time allows, have each student tell you their results for the stations. Show the students pictures and examples of birds with specialized beaks and what they eat. Can they match the bird beak to the food source?



Mallard Duck

The beaks of mallard ducks are wide and flat, with fringed edges allowing them to filter the water for food.




American Robin

Slender pointed beaks allow them to pick insects out of the soil.



Pine Grosbeak

A cone shaped bill gives strength for cracking open seeds.

	<p>Long, tubular bills resemble straws and allow them to drink nectar from flowers.</p>
<p>Hummingbirds</p>	

Supplementary Activities

Once the children have completed each of the experiments, gather them to discuss the results. This is a great opportunity to gain a better understanding of the scientific process.

1. Have ready a chart paper that looks like this (include the stations being used):

Station 1	Turkey Baster	
(Seeds)	Tweezers	
	Chopsticks	
Station 2	Tweezers	
(Bugs)	Wrench	
	Tongs	

2. Ask the students to sit together.
3. Ask each child to share their findings for Station 1. Record on data sheet. Explain that the more an experiment is repeated (and by different people) and the results are the same, the stronger the chance that the findings are true.
4. For some experiments the results will all be similar. On others, the results will be all over the place. This can lead to a good discussion as to why this happened (fairness of the experiment etc.)