Birds, Beaks, and Adaptations

Objective: The student will learn and describe how different kinds of bird beaks have adapted to feed on different foods within a specific habitat.

Materials:
Simulation habitat equipment
2 containers of water: one shallow (2" of water), one deep (10" or more water)
4 tweezers
4 tongs with tape over tong
4 long handled salad tongs
4 pliers
1 package of rice or popcorn
1 packages of sunflower seeds
1 stump with holes in it for rice or popcorn
any floating and non-floating objects, such as cut-up straws 1/2 inch long, raisins

Procedure:
Tell the students that they are going to become different kinds of birds. Show them the different "beaks." These include the tongs, tweezers, and other utensils. Explain to the group that their job is to find the proper habitat for which each bird is suited. Mention that the tools or "beaks" give some clue of what a bird eats and where it may live.

Show the students four habitats. See **Simulated Habitats** (Insert A). As you move into each new habitat, give a short description of the habitat to create a mood. The four habitats are marsh, pond, forest, and prairie.

Divide students into groups of four. Each group receives a different tool (i.e. one group receives pliers; one group receives tweezers, etc.). Groups will keep the same tool throughout the whole activity. Tell the students they will move from one habitat station to the next. They will have 30 seconds at each habitat station to eat as many food items as possible. The students must keep one hand behind their backs and cannot let their hand get wet.

For Food to qualify as eaten:
Marsh: Floating objects must be dropped in another container and hands can't touch the water.
Pond: Sinking objects or other non-floating objects must be dropped in another container and hands can't touch the water.
Forest: Rice/popcorn must be dropped in another container, can't be dropped on the floor.
Prairie: Sunflowers must be crushed over a container and the nut taken out.

Emphasize to students that they are not competing against one another. Remind them that they are trying to find the habitat that they are best suited to. Have the students record the number of food pieces eaten on the **Habitat Record Sheet** (Insert B).

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Simulated Habitats

Marsh	=	Pail with shallow water and surface floating objects
Pond	=	Pail with deep water and raisins or other non-floating objects
Forest	=	Log with holes and rice/popcorn to put into holes
Prairie	=	Sunflower seeds on a table

Some Facts to Help You Out

Forest Habitat - Woodpeckers

- corresponds to tweezers
- eats insects

Adaptations:

1. Long, sharp, "chisel" bill for hammering into tree trunks.
2. Stiff tail feathers used as prop to hold the bird upright on the side of the tree.
3. Long tongue that wraps around inside of skull - aids in extracting insects.
4. Toes - two face forward, two face backward for better vertical support on tree trunk.
5. Barbed tongue for extracting insects.

Prairie Habitat - Grosbeak, sparrow

- corresponds to pliers
- eats seeds

Adaptations:

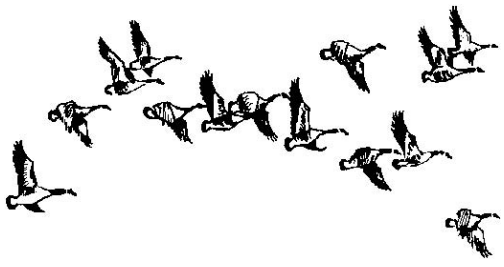
1. Heavy, conical bill with sharp edges for splitting seeds open. Strong jaw muscles.
2. Flocking behavior in winter because food may be concentrated in fields or "weed" patches.
3. Toes - three face forward, one behind for perching and hopping.

Marsh Habitat - American bittern, heron, tern

- corresponds to long handled salad tongs
- eats fish, frogs, large insects

Adaptations:

1. Long neck for plunging into water.
2. Sharp bill for spearing fish.
3. Long toes for walking on mud and grasping clumps of vegetation.
4. Coloration for blending into marsh vegetation.



Pond Habitat - Puddle duck

- corresponds to short tongs
- eats aquatic vegetation near the water surface

Adaptations:

1. Fringed or fluted bill for straining food from the water.
2. Webbed feet for propulsion through water. Also act as "snowshoes on mud."
3. Legs short, far back on body for swimming.

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Directions: Have all groups record the number of food pieces “eaten” from each habitat with each tool.

HABITATS

	Pond	Marsh	Forest	Prairie	**RESULTS**
BEAKS Pliers					
Short Tongs					
Long Tongs					
Tweezers					

Birds, Beaks, and Adaptations

VOCABULARY

Adaptation: The process of making adjustments to the environment through behavior, physical feature or other characteristic that will help a living thing survive in its environment.

Habitat: The surroundings in which an animal lives where all needs for life are found. This includes food, water, shelter, and space in a suitable arrangement.

Fresh Water Marsh: A wetland where standing fresh water exists year round in most conditions.

Pond: A still body of water smaller than a lake, often shallow enough that rooted plants can grow throughout.

Forest: A community of plants and animals in which trees are the most dominant member.

Prairie: A grassland community; a vegetative community in which grasses are the most dominant member.

Wetland: A wet land with specialized soil and plants, frequently or continually flooded, found on the edges of rivers, creeks, ponds, lakes, isolated depressions, or along the ocean, bay or estuaries.

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Optional River Modifications

This page provides teachers with options to enhance this activity, including more river habitats. These ideas represent what we at the Mississippi National River and Recreation Area have found to work, but you may modify the activity to meet your needs and your class size.

Optional Additional Habitats:

Field & River Habitats – Hawk, Bald Eagle

- Corresponds to scissors or wire cutters
- Eats mice, snakes, rabbits

  Adaptations:
  1. Sharp, hooked bill for ripping and tearing flesh
  2. Long, sharp talons, or claws, on strong toes for grabbing and holding prey
  3. Excellent eyesight for detecting the movement of prey in grass

Open Air Above River – Swallow, Nighthawk

- Corresponds to minnow/aquarium net
- Eats flying insects

  Adaptations:
  1. Net-like bristles around mouth to capture insects in flight
  2. Very good at maneuvering in the air to catch insects while flying

River Shallows Habitat - To incorporate more of the River ecosystem, change the Marsh Habitat to a River Shallows Habitat.

Garden/Floral Habitat - Hummingbird

NOTE: This habitat requires a bit more set-up, and some specialized equipment; the "flowers" can be found at farm supply stores.

- Corresponds to syringe or eye dropper
- Eats nectar from flowers (favors red flowers)

  Adaptations:
  1. Long, thin, straw-like beak for sipping nectar from flower centers
  2. Hover in the air while feeding by flapping wings very rapidly
  3. Only bird that can fly backwards, to leave the flower they are feeding on

Suggestions for class/group management:

It is best if each student has a distinct job to perform. Dividing students into groups of four keeps the group size manageable and provides each student a role to play.

A group of 28 students can be accommodated if all seven habitats are used; marsh, pond, forest, prairie, field and river, open air and garden/floral.

In each of these groups, there will be four jobs to be performed, one for each student. The students should rotate which job they perform each time they come to a new habitat, so everyone has a chance to try out all the jobs. The four jobs are:

- The Bird – This person will use the beak which the group selected in the beginning of the activity to gather as much food as possible (the same beak will be used by the group at each of the habitats).
- The Timer – This person will use a watch or the classroom clock to time the "bird" as he/she "eats" food (30 seconds should be allowed).
- The Counter – This person will count the number of food items "eaten" by the "bird" in the habitat.
- The Recorder –This person will record the number of food items that the Counter has counted in the chart (each group has one chart), and then record the same number on the master classroom chart for their group.

Other jobs that could be held by extra students (i.e. more than 28) include:

- Judging to make sure the "birds" are only using one hand to operate their beak, and that hands don't get wet in the Marsh or Pond Habitats
- Using an egg timer, set for 2 minutes or so, to call for groups to change habitat stations (they should have gathered food for 30 seconds, and finished all their counting and recording by this point)

HABITATS

BEAKS	Pond	Marsh	Forest	Prairie	Field/river	Open air over river	Garden/ Floral	RESULTS
Pliers								
Scissors								
Pencils **(Replaces Long tongs)**								
Syringes								
Minnow Nets								
Tweezers								
Short Tongs								