



Activity 2-F

FILL THE BILL



Summary

In this demonstration, students can find out how bird bills are adapted to tearing, scooping, stabbing, sucking, cracking, and picking up different types of food.

Learning Objectives

Students will be able to:

- Describe eight different kinds of bills and how each is adapted to feed on different kinds of food
- Relate this adaptation to the birds' survival in wetlands

Age Levels 7 +

Subject Area Science

Time 2 hours

Materials

- Copies of Copy Cat Page "Fill the Bill Matching Game" (one per student OR one per group)

Containers

- Two aquaria or other large clear containers
- Large saucepan
- Tall, thin vase, bottle, or glass jar
- Small log or large tree branch
- Long piece of string
- Eight pieces of paper to label the feeding stations

Foods

- Raw rice
- Rice cereal (like Puffed Rice or Rice Krispies)
- Plastic fishing worms or gummie worms or three-inch pieces of string
- Popcorn or tiny marshmallows
- Styrofoam chunks or pieces
- Oatmeal (oats porridge)
- Peanuts or other nuts
- Prunes hanging from a string

Bills (tools)

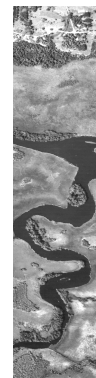
N.B. If you do not have access to some of the more expensive items, try to think of cheap substitutes.

- 4 pairs chopsticks, toothpicks, or small twigs (in pairs)
- 3 pairs pliers or nutcrackers
- 3 tweezers
- 3 strainers
- 3 small fishnets or envelopes
- 2 bamboo skewers
- 3 eyedroppers or straws
- 2 slotted spoons or large scoops

Background

Different types of birds eat different types of food. Each species has evolved a specialized bill and tongue that enables it to feed on a particular kind of food. If you look carefully at a bird's bill, you may be able to guess what type of food it eats. Wetlands provide a variety of food types, and attract many species of land and waterbirds. For example:

- **Hummingbirds and bananaquits** have long, narrow, hollow bills. The bill probes into flowers and protects the tongue, which licks up the nectar from flowers. Flowers that attract hummingbirds are often brightly-colored. Hummingbirds also catch small flying insects.
- **Snipes, sandpipers, and stilts** have long pointed bills whose tips can sense movement. They use their bills to probe for worms, crustaceans, and other small creatures in mud and water.
- **Pelicans** have long, flattened and pouch-like bills that they use to scoop up fish.
- **Egrets and herons** have long, thin bills for spearing frogs or fish in the water.
- **Flamingos and some ducks** have bills that act like strainers, which they use to filter tiny plants and animals.
- **Parrots** have short, powerful conical bills that are very strong, with which they can break open tough seeds and get the fruit from around a seed.
- **Bullfinches, grassquits** and similar birds have short, conical bills that are very strong and can break open seeds.
- **Warblers** have small, sharp, pointed bills for picking insects from leaves, logs, and twigs.
- **Nighthawks, potoos, swifts, and swallows** have large, gaping mouths that act like nets to trap insects. These birds catch insects on the wing.



Preparation

1. Assemble the equipment.
2. Set up eight different stations, each with a special type of food. At each station you will need three different tools, one that represents the bill that best fits the food (in one case, two) and two that don't fit so well.
3. Place a sign at each station to say what type of food is represented (e.g., At station 1, *Nectar*; at station 2, *Worms*, etc.).
4. The following is a list of food and tools for each station. The correct tool is indicated by an asterisk (*). In one case (station 4), there are two correct tools, for two different types of fish-eating birds; the second correct choice of bird and tool is indicated by a double asterisk (**).

Station 1: Water in a thin vase or glass to represent **nectar** in a flower (hummingbirds and bananaquits).

Tools:

- eyedropper or straw*
- envelope or small fishnet
- large scoop or slotted spoon

Station 2: Large saucepan filled with dry oatmeal, with pieces of string or plastic (or gummie) worms on the bottom to represent **worms** buried in the mud (snipes, sandpipers, and stilts).

Tools:

- chopsticks, toothpicks, or twigs*
- pliers or nutcrackers
- strainer.

Station 3: Whole peanuts or other nuts to represent **seeds with hard coverings**, such as sunflower seeds (bullfinches, grassquits, sparrows, buntings, and other finch-like birds, and also parrots).

Tools:

- pliers or nutcrackers*
- tweezers
- chopsticks, toothpicks, or small twigs

Station 4: Styrofoam chunks floating in an aquarium or other large container filled with water, to represent **fish and other aquatic animals** (pelicans,* herons, and egrets**).

Tools:

- large scoop or slotted spoon*
- bamboo skewer**
- eyedropper or straw
- chopsticks, toothpicks, or twigs

Station 5: Puffed rice in an aquarium or other large container filled with water, to represent **tiny aquatic plants and animals** (flamingos and ducks).

Tools:

- strainer*
- tweezers
- pliers or nutcrackers

Station 7: Rice spread on a log, surrounded by leaves (put rice under leaves as well) to represent **caterpillars and other insects** (warblers).

Tools:

- tweezers*
- chopsticks
- strainer

Station 6: Popcorn or tiny marshmallows, which must be tossed in the air and caught in the air, to represent **flying insects** (nighthawks, swifts, and swallows).

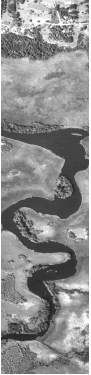
Tools:

- envelope or small fishnet*
- tweezers
- chopsticks, toothpicks, or twigs

Station 8: Prunes hanging from a string to represent **fruit** hanging from a branch (parrots).

Tools:

- eye dropper or straw
- strainer
- nutcracker or pliers*



Procedure

1. Pass out the Copy Cat Page "Fill the Bill"
2. Divide your group into eight teams. Each team will start at a different station.
3. Explain that there are three different tools at each station, each of which represents the bill of a different type of bird. Each group **must test and decide** which tool is most efficient at getting the food. Also explain that one station will have two tools that work well for the food provided.
4. Once they pick the best tool, they write it in the appropriate square on the handout (e.g., in square 1 Nectar, write eye dropper or straw.)
5. On the line underneath each picture on the handout, students should write the type of food and the number of the tool that represents the correct bill. For example, beside the hummingbird write nectar, 1.
6. Discuss bill adaptations,, explaining how, after millions of years, many birds have evolved very specialised bills. Remind the students that some birds are so specialised that they can only eat one type of food. For example, Flamingoes use their bills to feed on brine shrimps in very salty water. If the water dries up or there are no shrimps, they must move to another place or starve.
7. Other birds have less specialised bills (e.g., Grackles). If one type of food is in short supply, they simply eat something else.

Extension

Discuss what other things wetland birds use their bills for, such as:

- Display
- Singing
- Aggression and defence
- Nest building

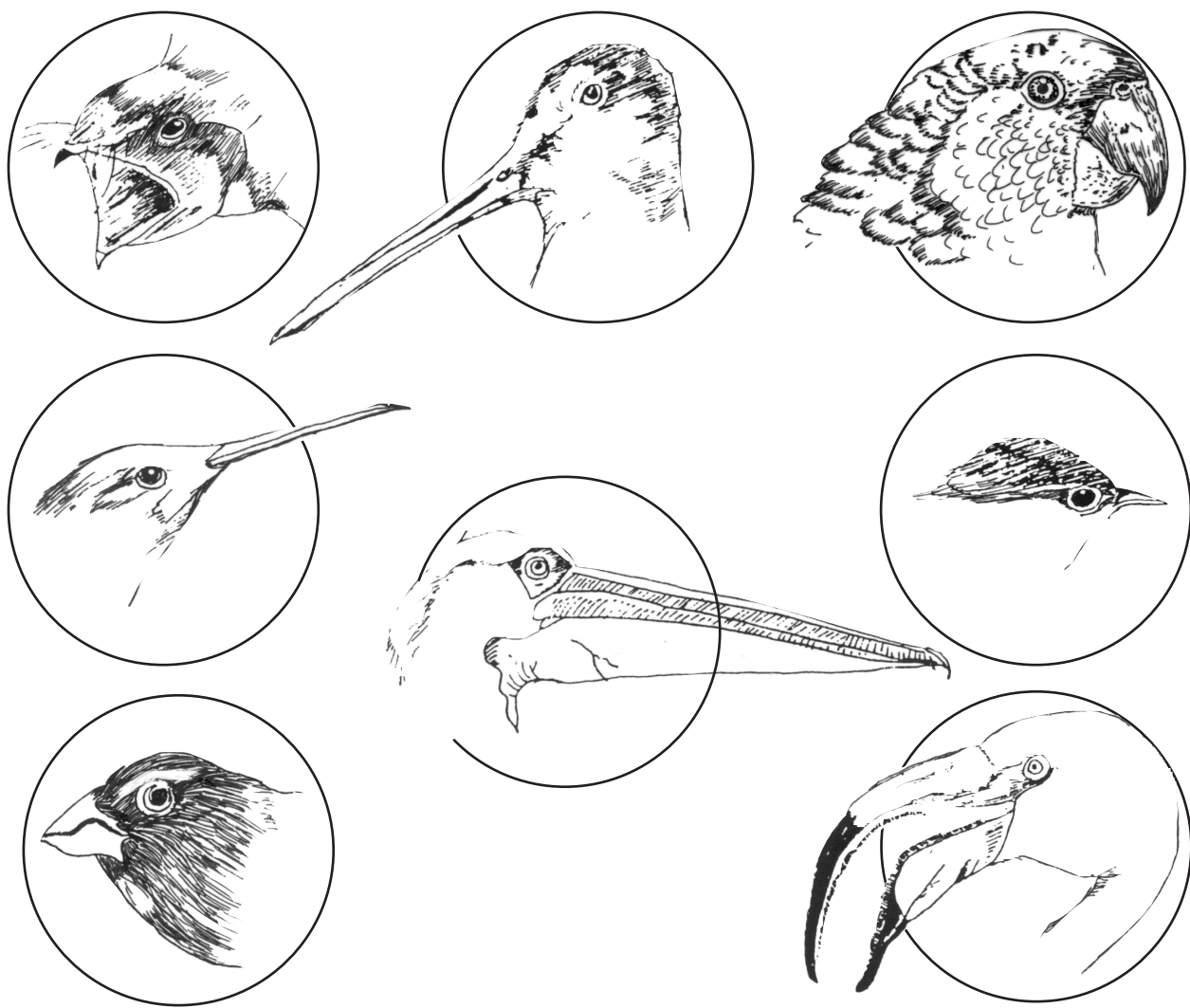
Try to think of examples of each.

Discuss what other adaptations wetland birds have for feeding, such as:

- Feet (e.g., Osprey catch fish with feet)
- Wings (e.g., Grebe's wings allow them to "fly" under water in pursuit of fish)
- Body camouflage (to hide from prey)
- Special behaviour (e.g., stalking, herding prey)

Source Adapted from Ranger Rick's Nature Scope "Birds, Birds, Birds"

Fill the Bill matching game



Match the food in column 1 with the best tool for the job in column 2. Write the number of the correct tool on the blank next to the name of the food.

- _____ Nectar (Hummingbird)
- _____ Worms (Snipe)
- _____ Seeds (Bullfinch)
- _____ Fish and frogs (Pelican)
- _____ Tiny water plants and animals (Flamingo)
- _____ Flying insects (Swallow)
- _____ Caterpillars and crawling insects (Warbler)
- _____ Fruit (Parrot)

- 1. Pliers or nutcrackers
- 2. Slotted spoon or scoop
- 3. Strainer
- 4. Eyedropper or straw
- 5. Bamboo skewer
- 6. Tweezers
- 7. Fishnet or envelope
- 8. Chopsticks or toothpicks

COPY CAT PAGE

