

### Integrating Hands-on Activities

The texts are useful in helping students recognize various bird adaptations. In addition to the texts, hands-on activities provide data in which students understand how certain adaptations allow for the birds survival. One particularly informative activity is the Bird Beak Buffet (Council for Environmental Education 2009) by *Growing Up WILD: Exploring Nature with Young Children*. We modified and presented the activity in the 5E (Bybee 2006) learning cycle. Within this activity, students are provided a variety of items that simulate the beaks of different birds along with representative food. While we did not conduct this exploration, we suggest presenting this on the *third or fourth day* after students have begun to identify both physical and behavioral adaptations presented in the Bruchac (1993), Davies (2004), and Yolen (1987) texts.

**Engage:** Ask students what is adaptation? What are some examples of adaptation? What do birds need to survive? What type of food do birds eat? Present a series of photos of birds and ask students what type of food would the animal eat based on the shape of the beak.

**Explore:** Prior to exploration, set-up 8 stations with different bird beak tools for student to explore. Tools include: chop sticks, turkey basters, a scoop or cup, scissors, tweezers, nut crackers, strainers, and tongs. Along with the tools, the students are provided with different food to simulate what the birds might eat. Food to include: a tall graduate cylinder with water (represents nectar in flowers), plastic fish in water, gummy or plastic worms buried in soil, rice grains tucked in Styrofoam (represents insects in logs), nuts, craft clay around a stick (represents meat), and tea leaves in water (represents algae). Safety: The teacher may want to omit the station with nuts and nutcracker if there is a student with a nut allergy. Another food safety issue involves the use of soil and gummy worms. Remind students that the soil is not edible and to not attempt to eat the gummy worms.

Divide students into groups of 3 or more to rotate between the 8 stations. Stations should be placed evenly throughout the classroom. At each station, there should be at least 3 of the same beak tools and all 8 types of food. Students are to explore which material is easier to eat with the particular tool. Students will record in their science journal the tool and the food best suited for that bird beak tool.

Other modifications of this activity could be to provide multiple tools and one type of food at a station; time how long the beak takes to “eat” a particular food; or some other combination based on the teacher’s desired outcome and students ability to work with data. Note: the tools may not function in the same fashion as the actual bird beak.

Questions to support learning include: Does the shape of the beak limit what the bird can eat? Which bird beak worked best for the food?

**Explain:** Discuss with students which beak seemed to be better suited for certain types of food. How do you relate the types of tools at the stations to the pictures of the bird beaks presented at the beginning of the class? What did these stations show you about bird beaks? What if the food supply diminished or no longer was found in the area? What would happen to the bird? These questions help students recognize how specific bird beaks allow that bird to eat one type of food over another. Key is that the students should be making connections bird have different kinds of beaks. The shape of the beak allows for easier access to the particular food supply. If the environment is altered, the bird (organism) may not survive. Adaptation to a particular environment takes place over time as birds best suited to that environment survive and pass the traits to the next generation.

**Evaluate:** Each group will be assigned a station in which they will make a brief presentation

about the beak and the type of food best suited for that beak. Each group should explain which actual bird would be best suited for that station. Describe what might happen if the food supply for that particular animal was lost. For example, what would happen to a duck or swan if there was no more algae in a pond? Encourage groups to use evidence from the exploration to support their discussions.

**Elaborate:** Provide students with a different bird that feeds on a particular food source. Students would need to describe what adaptations including the beak that allow the bird to survive. For example, an owl that is nocturnal as found in Yolen's (1987) text. This will be useful in helping students recognize adaptations explored in the independent research on a bird.

Additional Activities:

Teacher/Student resources:

There are more resources that can be used to explore bird adaptations at the following:

- Project Beak (<http://projectbeak.org/>)
- The Cornell Lab of Ornithology (<http://www.birds.cornell.edu/>)

Citizen Scientist:

Additional activities may involve students as ornithologist (e.g., birders). There are numerous citizen science projects – research conducted by non-professionals or amateurs – students can engage in the scientific community as an active member.

- Project Feeder Watch (<http://feederwatch.org/>)
- North American Breeding Survey (<https://www.pwrc.usgs.gov/bbs/>)
- Hawk Migration Association of North America (<http://www.hmana.org/>)

Examples of Kids as Ornithologist:

- Kids Birding (<http://kidsbirding.com/category/ornithology/>)
- American Birding Association (<http://youngbirders.aba.org/>)