

*Welcome to the natural world of Fontenelle Forest and Neale Woods Nature Centers!
Below is a guide to pre and post field trip activities that you can do with your students either indoors or on your school grounds. These fun activities will greatly enhance your students' field trip experience. We look forward to your students' arrival and are excited to provide them with a fun and educational experience. If you have any questions, please call us at 731-3140.*

Birds of a Feather

The following activities meet Nebraska state science standards 8.2.1, 8.4.3 & 8.4.5

1) Fill the Bill

Concept: Explain how different birds' beaks are adapted to feed on different foods.

Suggested Timing: Pre-Trip

Time: 45 minutes

Location: Indoors

Materials: 3 eye droppers or straws, 4 pairs of chopsticks, 3 nutcrackers or pliers, 2 large scoops or slotted spoons, 3 strainers, 3 envelopes or small fishnets, 3 forceps or tweezers, 3 tongs, small log, popcorn or tiny marshmallows, rice, puffed rice, 2 aquariums or other large containers, fake worms or grapes, oatmeal, cherries, one tall/thin vase, large saucepan, walnuts or other nuts, Styrofoam chunks, string

Procedure: Each kind of bird has a specialized beak adapted for eating certain types of food. Students will discover which beaks are best for which foods by going to stations and matching a beak (tool) with a type of "food."

Ask the students what 'adaptation' means. Discuss how animals have become adapted over time for their particular environments. How have humans adapted? How have birds adapted? Discuss different bird beaks to get the students thinking about how beaks help birds survive.

- Hummingbirds: Long, hollow beaks used for probing flowers for nectar.
- Curlews, godwits, snipes: Long beaks used to probe mud and water for worms, crustaceans and other small animals.
- Cardinals, sparrows, and other finch-like birds: Short, conical beaks that are strong and used to break open seeds.
- Spoonbills and pelicans: Long, flattened or pouch-like beaks used for scooping up fish and other aquatic animals.
- Flamingos and some ducks: Bills that act like strainers to filter small plants and animals from the water.
- Nighthawks, whip-poor-wills, swifts and swallows: Large, gaping mouths used like nets to trap insects. These birds catch insects while flying.
- Warblers: Small, sharp, pointed beaks for picking insects from leaves, logs, and twigs.
- Toucans: Long, thick beaks used for reaching out and plucking fruit from trees.

Set up eight stations with a type of "food." Place three different tools at each station - one that fits the food and two that do not. Post a sign at each station telling what type of food is

represented (ex: sign at station #1 says “nectar”) Below is a list of food and tools for each station (* indicates the tool that fits the food the best).

Station #1: Water in a tall, thin vase to represent nectar in a flower (hummingbirds).

Tools: eyedropper*, envelope or small fishnet, large scoop or slotted spoon

Station #2: Large saucepan filled with dry oatmeal, with grapes on the bottom to represent worms buried in the mud. You can use fake rubber worms instead of grapes, if you can find some (curlews, godwits, snipes).

Tools: chopsticks*, nutcracker or pliers, strainer

Station #3: Whole walnuts or other nuts to represent seeds with hard coverings (sparrows, cardinals, grosbeaks, and other finch-like birds).

Tools: nutcracker or pliers*, tongs, chopsticks

Station #4: Styrofoam chunks floating in an aquarium filled with water to represent fish and other aquatic animals (spoonbills and pelicans).

Tools: large scoop or slotted spoon*, eyedropper or straw, chopsticks

Station #5: Puffed rice in an aquarium filled with water to represent tiny aquatic plants and animals (flamingos and some ducks).

Tools: strainer*, forceps or tweezers, tongs

Station #6: Popcorn or tiny marshmallows tossed in the air (which must be caught while in the air) to represent flying insects (nighthawks and whip-poor-wills)

Tools: envelop or small fishnet*, forceps or tweezers, chopsticks

Station #7: Rice spread on a log to represent caterpillars and other insects (warblers).

Tools: forceps or tweezers*, envelope or small fishnet, nutcrackers or pliers

Station #8: Cherries hanging from a string to represent fruit hanging from a branch (toucans). Tools: tongs*, eyedropper or straw, strainer

Give each student a copy of the handout (see below). Find pictures of the birds listed in the handout (focusing on the beak shape) and post them in the room as a reference tool. Divide the group into eight teams and start each team at a different station. Explain that there will be three different tools at each station, each of which represents a different type of bird beak function. Each group must decide which tool would most efficiently get the food at each station (they should decide by trying out the different tools). Once they pick the best tool, they should write the name of the tool on the appropriate line of their handout. You might want to set a time limit at each station to keep things moving. After writing in each tool, the group should decide which bird’s beak is represented by that tool and then write the answer on the handout.

Fill the Bill - Handout			
<u>Station</u>	<u>Type of Tool</u>	<u>Name of Bird</u>	
1 Nectar			
2 Worms in the Mud			
3 Seeds			
4 Fish & Other Water Creatures			
5 Tiny Water Plants & Animals			
6 Flying Insects			
7 Caterpillars & Other Insects			
8 Fruit			
<u>Bird Word Bank:</u>			
Whip-poor-will	Pelican	Hummingbird	Flamingo
Snipe	Toucan	Grosbeak	Warbler

After the activity, ask the group how specialized beaks can help some birds stay alive. (A bird with a specialized beak can often eat a type of food that no other bird can eat.) Then ask how a specialized beak might hurt a bird. (If the bird's habitat changes and its food is no longer available, the bird might die because it can't eat anything else.) Explain that some birds, like crows, have very versatile beaks. Crows can eat fruits, nuts, berries, dead animals, and even fish and small rodents. If one type of food is not available they can always eat something else.

Adapted from Ranger Rick's Nature Scope: Birds, Birds, Birds.

2) Make a Suet Feeder

Concept: The goal of this activity is for students to learn observation and identification skills while watching birds at a bird feeder.

Suggested Timing: Post-Trip

Time: 30 minutes

Location: Outdoors (to hang feeder)

Materials: Suet, net bag, string

Procedure: Suet is a solid white beef fat. If you ask at a meat counter and tell them you want it to feed the birds, they might even give it to you for free. It comes in smaller or bigger chunks—either is okay. Put 3 small pieces and 3 big pieces of suet in the net bag. (If you can't find beef fat, you can substitute lard, which can be found at the grocery store too.) The net bag could be an onion bag, potato bag, or the kind that apples and oranges sometimes come in. Bunch the bag's top together and tie one end of a 2 foot string tightly around it. Tie the other end of the string around a tree branch or railing that is strong enough to hold the bag.

Tip: The suet feeder works best in winter, when the birds can't find much food outdoors. If you hang the suet bag up in the summer, be sure to refill it with fresh suet about once a week, so it doesn't spoil before the birds eat it all up.

Extensions:

- Roll the suet in different kinds of birdseed. See which kinds the birds like best.
- Use different colored bags.
- Make notes about which birds come to the feeder and what seeds and color of bags they like best—or don't like.

Adapted from Burns, Diane L., et al. More Fun with Nature: Take-along Guide. Minnetonka, MN: North Word Press, 2002.

3) Wing Chord Data Analysis for Dark-Eyed Juncos

Note: This post-activity supports Nebraska State Mathematics Standards 8.2.2, 8.5.1, 8.5.2 & 8.5.4 and OPS Pre-Algebra Standards 08-05 & 08-08.

Concept: The goal of this activity is for students to analyze and interpret data.

Suggested Timing: Post-Trip

Time: 30-45 minutes

Location: Indoors

Materials: Calculator

Procedure: Ornithologists (scientists who specialize in birds) and bird banders often use measurements to learn more about the birds they are studying. One example involves measuring the length of the wing. The term used to describe the length of a bird's wing is "wing chord". The wing chord is measured in millimeters using a tool called a wing rule.

When banding a bird, it is important to determine the bird's gender (i.e. male or female) if possible. In some cases, it is possible to determine a bird's gender by measuring its wing chord. This can be especially useful in species where the males and females look the same. For most species of birds, males have longer wings than females on average. There is some overlap, however. Sometimes a bird with a very short wing chord can be called a female. Sometimes a bird with a very long wing chord can be called a male. Many times the wing chord measurement falls in the overlap area, and it is not possible to determine if the bird is a male or female.

The Dark-Eyed Junco is a small songbird that is a type of sparrow. It breeds throughout northern Canada and the Rocky Mountains of the western United States. In the winter it migrates south and searches for food throughout most of the United States. Juncos are generally gray or brownish-gray on their backs and heads, and they have white bellies. Females tend to be more brownish and males tend to be darker gray. However, there is a lot of overlap in their colors, and juvenile birds can be brownish or grayish or both. It is difficult to determine a junco's gender based on its color. However, wing chord can often be a good indicator of the bird's gender.

The following data was collected by a bird bander in Nebraska who was banding Dark-Eyed Juncos during the winter. Review the data and then answer the questions that follow.

Banding Data for Dark-Eyed Juncos		
Gender	Wing Chord	Back/Head Color
Male	79mm	dark gray
Female	69mm	gray and brown
Female	71mm	brown
Male	73mm	brownish-gray
Female	77mm	gray and brown
Male	74mm	gray-brown
Male	75mm	gray
Male	82mm	dark gray
Female	75mm	gray-brown
Female	74mm	pale gray
Male	78mm	gray

Questions:

1. Based on the data in the table above, what is the range (lowest to highest values) for wing chords for Dark-Eyed Juncos?
2. What is the range just for males?
3. What is the range just for females?
4. What is the overlap range where males and females have the same wing chord measurements?
5. Based on the data in the table above, what is the average length for wing chords for Dark-Eyed Juncos?
6. What is the average length just for males?
7. What is the average length just for females?
8. Based on the data in the table above, can you draw any conclusions about using the color of a junco's back/head to determine its gender?

Applying What You Learned:

Pretend that you are a bird bander and that you have just caught four Dark-Eyed Juncos. For each bird, you measure its wing chord. Answer the following questions:

1. The wing chord of the first bird is 80mm. Is it a male or female?
2. The wing chord of the second bird is 75mm. Is it a male or female?
3. The wing chord of the third bird is 73mm. Is it a male or female?
4. The wing chord of the fourth bird is 71mm. Is it a male or female?

Answers to Questions:

1. 69mm – to 82mm
2. 73mm – 82mm
3. 69mm – 77mm
4. 73mm – 77mm
5. $(79+69+71+73+77+74+75+82+75+74+78)/11 = 827/11 = 75.2\text{mm}$
6. $(79+73+74+75+82+78)/6 = 461/6 = 76.8\text{mm}$
7. $(69+71+77+75+74)/5 = 366/5 = 73.2\text{mm}$
8. Females are usually paler and browner than males. Males are usually darker, grayer and less brown than females.

Answers to Applying What You Learned:

1. male
2. unknown (wing chord falls in the overlap range)
3. unknown (wing chord falls in the overlap range)
4. female

4) Project BEAK: www.projectbeak.org

Project BEAK is an interactive, web-based curriculum targeted at students in grades 5-8. The website contains information about Nebraska's wild birds and their adaptations. It also addresses conservation, bird watching and Nebraska's threatened and endangered bird species.

The Project BEAK website is divided into six different modules. Each one contains relevant, fun information, plus video clips, interactive games, quizzes, diagrams, links to other related websites and classroom lesson plans. Using Project Beak, you can create many different types of activities for your students both before and after your field trip to Fontenelle Forest.

Resources

Cornell Lab of Ornithology. Home page. 14 January 2008 <<http://www.birds.cornell.edu/>>.

Cornell Lab of Ornithology. Bird Sleuth. 14 January 2008
<<http://www.birds.cornell.edu/birdsleuth>>.

Cornell Lab of Ornithology. Project PigeonWatch. 15 January 2008
<http://www.birds.cornell.edu/programs/urbanbirds/ubs_PIWMainEN.html>.

Braus, Judy, ed. Ranger Rick's Nature Scope: Birds, Birds, Birds. Washington, DC: National Wildlife Federation.