Science Unit: **Bird Diversity**

Lesson 2: ***Why do birds have different shaped beaks?***

Summary: In this lesson, students explore how bird beaks work by comparing them to human tools and use their exploration to make inferences about what birds eat based on the shapes of their beaks.

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Grade level	2–3
Class time needed	1 hour and 20 minutes
Delivery date	April 5th, 2017

LEARNING OBJECTIVES

1	Learn about the beak adaptations of five indigenous birds.
2	Compare bird beaks to human tools.
3	Investigate the types of food eaten by five different indigenous birds based on the shape of their beaks.

SUPPLIES

- Photographs of: sunflower seeds attached to a flower, blueberries attached to a bush, invertebrates in mudflats, tubular flowers, and small floating plants
- Tools: nutcracker, eyedropper, tweezers, bamboo skewer, and sieve (at least one for each group).
- Food to harvest: a cup of juice, gummy worms in wheat bran, grapes in a bunch, pumpkin seeds in the shell and alfalfa sprouts floating in a bowl of water (one set for each group).
- Close-up photographs of five indigenous birds and their beaks: Rufous hummingbird, house finch, long-billed dowitcher, mallard duck and American robin (or choose similar birds indigenous to your region).
- Observation recording sheet.

BACKGROUND INFORMATION

Bird beaks are lighter than bones and teeth yet they are also strong and functional. Different birds have different shaped beaks. Bird beaks have adapted over generations to suit the food resources available. The shape of a bird's beak gives us a clue as to which type of food the bird eats, for example:

- Hummingbirds have long hollow beaks and long tongues that help them draw out nectar.
- Sandpipers have long bills that allow them to probe in the mud to grab insects and other invertebrates.
- Finches have triangular bills, which help them gain leverage to crack open seeds.
- Swallows and other aerial insect eaters have wide mouths to help them scoop up flying insects.

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- Eagles and other raptors, like hawks and owls, have strong and sharp, curved beaks to help them tear at fish and small mammals.
- Omnivorous eaters like black-capped chickadees and American robins have pointed beaks for eating a variety of foods, such as berries, seeds and invertebrates.
- Mallards and other dabbling ducks have a bill like a sieve. There are lamellae on the inside of its bill, which look like teeth but they're not for chewing their food. Instead, the lamellae act like a sieve by catching food (seeds, invertebrates, plants), while letting water and mud flow out.

To help us understand how bird beaks work we can compare them to common human tools, such as tweezers, sieves or nutcrackers.

THE LESSON

The Hook	**Exploratory discussion of bird beaks and tools** • What shape do you think a bird beak would need to be to eat each of these foods? Show photos of: sunflower seeds, berries, invertebrates in mudflats, tubular flower and small floating plants. • Bird beaks are similar to tools. Can you name a tool used by humans and what it does?
Hands-on Activity 1	**In small groups explore tools, food and bird beaks** • Part 1: Test out the different tools and food (see supply list). Which tool is **best suited** to harvesting each type of food. Why? Record your observations (recoding sheet provided below). • Part 2: Match each food/tool combo to one bird beak (see supply list) that it is **most similar** to. Why did you make this choice?
Wrap Up	• Discuss: Which type of bird beak is your favourite? What does this type of beak allow a bird to eat? • Read *Beaks* now or later to review learning.

VOCABULARY

Adaptation	A physical feature or behaviour that helps a living thing survive and function in its environment. Over generations the feature or behaviour evolves to better suit the organism's habitat.
Beak or Bill	The external jaws of a bird used to grasp food, groom, fight, build nests, feed young and in courtship.
Habitat	The home that contains the resources needed for an organism, such as a plant or animal to survive.
Lamellae	Small tooth-like protrusions inside the bill of some water birds that serve as a feeding filter.
Organism	A living animal, plant or fungi.
Resource	Any living or non-living thing that animals (including humans) use to meet their needs.
Sieve	A wire mesh utensil used to strain solids from liquids.

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REFERENCES

Collard, S.B. 2002. *Beaks.* Charlesbridge.

The Cornell Lab of Ornithology and Pennington. Beaks.
http://www.birdsleuth.org/beaks/ (accessed May 2017)

The Cornell Lab of Ornithology and Pennington. Feathered Friends.
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Davis, B. The Scoop on Duck Bills. Ducks Unlimited. (accessed May 2017)

EXTENSION

1. Invite a raptor rescuer or falconer to your classroom to get a closer look at a raptor's (owl, hawk, eagle or falcon) beak and feet, such as O.W.L.: Orphaned Wildlife Rehabilitation Society.
2. Visit the Bloedel Conservatory (an indoor tropical garden in Queen Elizabeth Park in Vancouver) to take a closer look at tropical birds. Recording sheet is attached below.
3. Visit the Beatty Biodiversity Museum at the University of British Columbia to get an up close look at a variety of birds.

ADD BIRD BEAK RECORDING SHEET

ADD BLOEDEL CONSERVATORY RECORDING SHEET

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