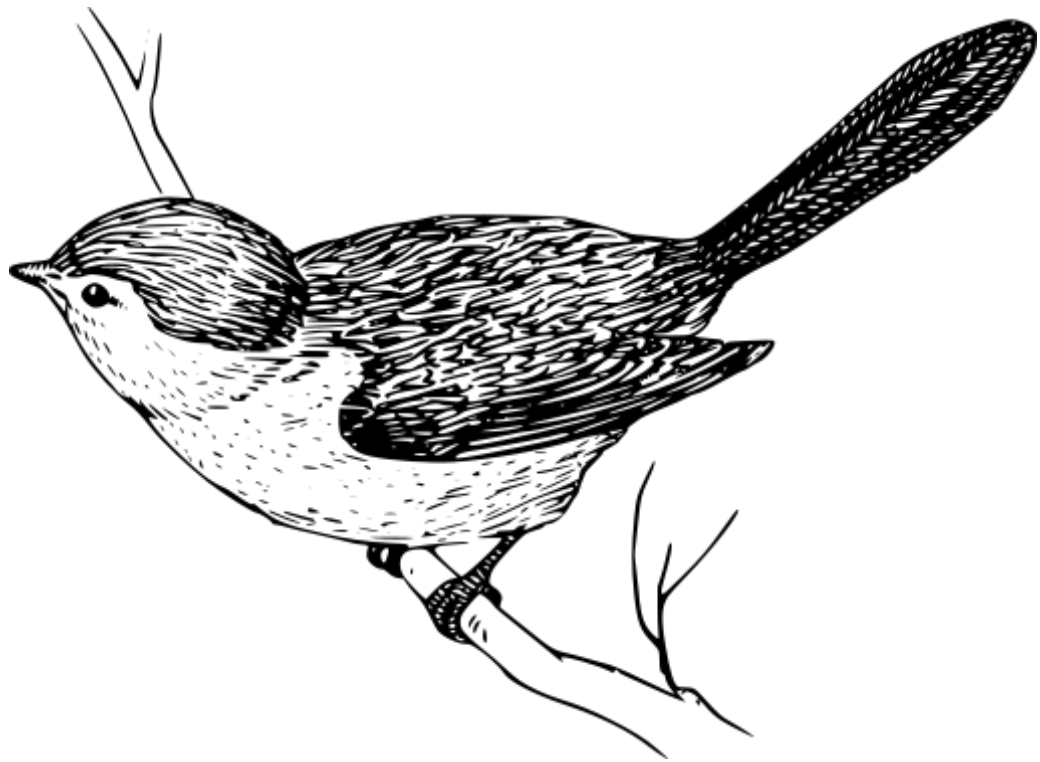




Bills & Beaks

Bills & Beaks Adaptations Lessons



NATIONAL
WILDLIFE
REFUGE SYSTEM



Bills & Beaks

Summary of Activities

This binder includes a variety of activities and background information related to birds and their beaks. The trunk also contains supporting materials for the activities in this binder as well as extra materials to use for additional activities at your own leisure. Feel free to use the lessons in this binder and materials in the trunk how it best fits your goals and needs.

Please be respectful with the artifacts and items.

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Season:

All

Objectives:

Students will be able to...

- Notice the differences in different types of bird's beaks and how that impacts what a bird eats.
- Determine some of the differences between different types of birds and how they unique differences aid in survival.

Key Concepts:

- Birds
- Habitats
- Adaptations
- Bills/Beaks



State (SEEd) Standards

Kindergarten

Standard K.2, Living Things And Their Surroundings

Standard K.2.2, Obtain, evaluate, and communication information about patterns in the relationships between the needs of different living things and the places they live.

Standard K.2.4, Design and communicate a solution to address the effects that living things experience while trying to survive in their surroundings.

First Grade

Standard 1.2, The Needs Of Living Things And Their Offspring

Standard 1.2.2, Construct an explanation by observing patterns of external features of living things that survive in different locations.

Second Grade

Standard 2.2, Living Things And Their Habitats

Standard 2.2.1, Obtain, evaluate, and communicate information about patterns of living things in different habitats.

Standard 2.2.2, Plan and carry out an investigation of the structure and function of plant and animal parts in different habitats.

Third Grade

Standard 3.2, Effects Of Traits On Survival

Standard 3.2.3, Construct an explanation that the environment can affect the traits of an organism.

Standard 3.2.4, Construct an explanation showing how variations in traits and behaviors can affect the ability of an individual to survive and reproduce.

Fourth Grade

Standard 4.1, Organisms Functioning In Their Environment

Standard 4.1.1, Construct an explanation from evidence that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.



Bills & Beaks Trunk Materials List

Tools (Beaks)

- Strainers (4)
- Chopsticks (7)
- Slotted Spoons (4)
- Tongs (2)
- Pliers/Wrenches (2)
- Eye Droppers/Pipettes (4)
- Large Envelope
- Yarn
- Straw
- Scissors

Food Sources

- Large Log (Driftwood) with Rice
- Bin of Oats and Rubber Worms
- Green Foam Pieces
- Sunflower Seeds
- Packing Peanuts

Miscellaneous Items

- Large Plastic Bins (3)
- Food Coloring
- Water Beakers
- Water Pitcher
- Eagle Talon
- Toucan Skull
- Raptor Skull
- Ibis Skull
- Bird Skull/Beak Images
- Signs with Bird Pictures and Corresponding Activity Tool
- Bills & Beaks Adaptations Lessons Activity Binder



What is a Bird?

Background Information

Birds are warm-blooded **vertebrate** animals that are considered the closest living descendants to dinosaurs. There are about **11,000 species** of birds on the planet with birds being found on every continent and in virtually every global habitat.

As with all groups of animals, birds have a few unique **adaptations** that set them apart from other vertebrates. Many of the special adaptation's birds have are meant to assist in the act of **flight**. To start, birds are the only living animal on the planet with **feathers**. While one of the main purposes of feathers is to aid with flight, birds also have feathers that are special to keeping a bird warm through insulation, protecting a bird from weather and physical objects, and helping a bird to blend in with their surroundings through camouflage.

In addition to feathers, birds also have **hollow or pneumatic bones** that help them with flight. These hollow bones contain air sockets or gaps that allow the bones to remain hollow and light. By reducing the bodyweight of the birds, birds are able to achieve flight much easier and reduce any drag or air resistance.

Furthermore, birds also have an efficient breathing system. The lungs of a bird have special balloon-like **air sac** extensions that allow birds to bring in more oxygen through their lungs to their body cells and muscles. More oxygen allows birds to rapidly generate the energy they need to fly and maintain a high body temperature.

Although many of the special adaptation's birds have are meant to help with flight, birds also have other adaptations including a **beak** instead of a mouth and teeth. Similar to the function of a mouth, bird beaks are used for eating. However, they also have many other purposes including helping to feed a bird's young, building a nest or collecting supplies, and hunting and grasping prey.

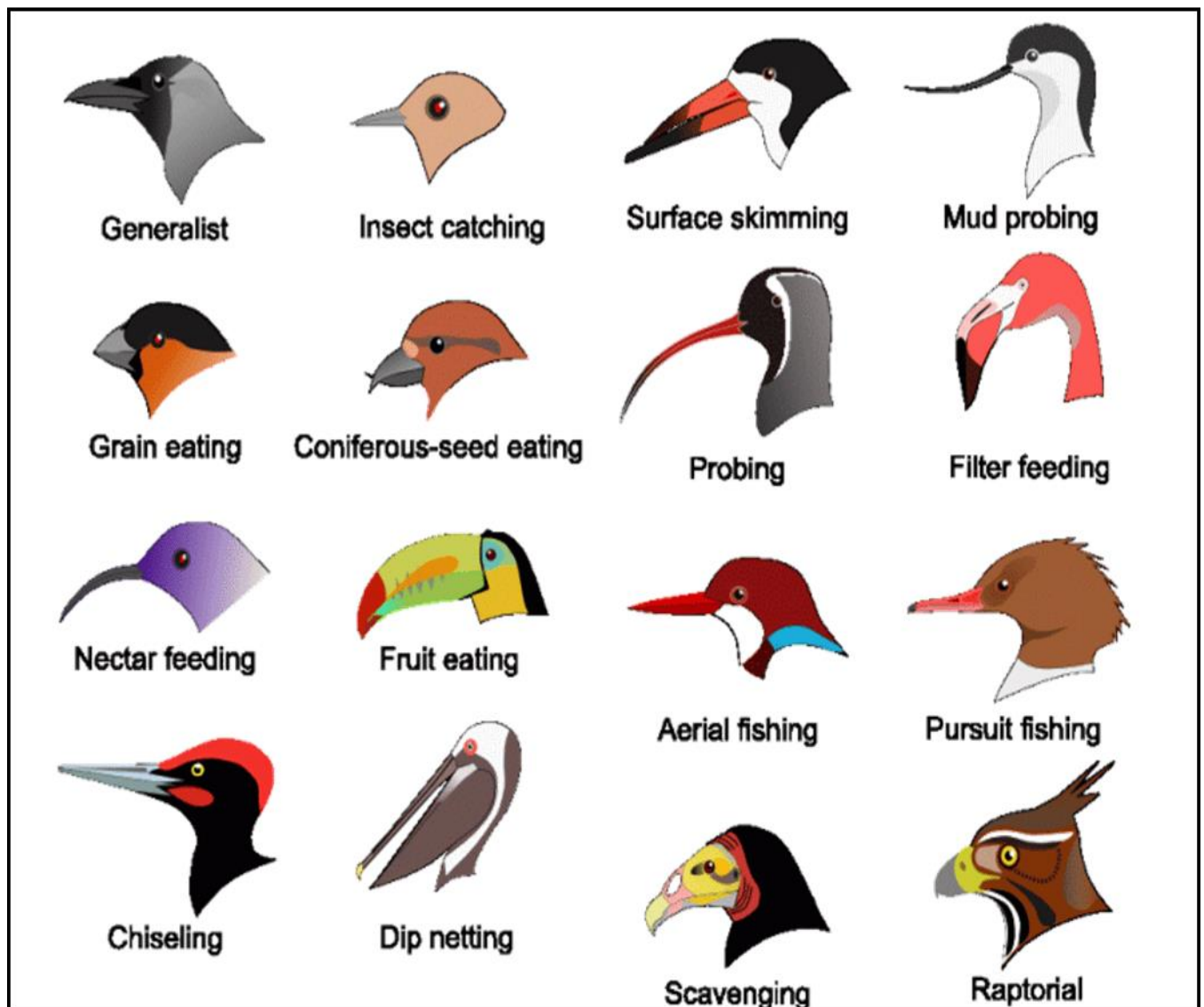


Bird Beaks

Background Information

Bird beaks are one of the defining characteristics of birds. The primary function of a bird's beak or bill is for eating and gathering food. Depending on the size and shape of a bird's beak, the beak can be used for different food-related tasks. Some of these tasks include tearing, crushing, breaking, shearing, picking, and probing. In addition to acting as a utensil for food, bird beaks are also used as a tool for birds to clean and preen their feathers.

Here is a list of some of the common bird beaks:





Bills & Beaks

Summary

All birds have unique and important adaptations that help them to live successfully in their chosen habitats. One of the most important adaptations birds have is their beak. Beaks are essential for activities such as foraging and eating.

In this activity, students will discover the differences between different types of bird's beaks and how they impact what a bird eats.

Materials Included

- Strainers (4)
- Chopsticks (7)
- Slotted Spoons (4)
- Tongs (2)
- Pliers/Wrenches (2)
- Eye Droppers/Pipettes (4)
- Large Envelope
- Yarn
- Straw
- Scissors
- Large Log (Driftwood) with Rice
- Bin of Oats and Rubber Worms
- Green Foam Pieces
- Sunflower Seeds
- Packing Peanuts
- Large Plastic Bins (3)
- Food Coloring
- Water Beakers
- Water Pitcher
- Bird Skull/Beak Images
- Signs with Bird Pictures and Corresponding Activity Tool
- Fill the Bill Worksheet

Time:
30 minutes

Season:
All

Objectives:
Students will be able to...

- Notice the differences in different types of bird's beaks and how that impacts what a bird eats.
- Determine some of the differences between different types of birds and how they unique differences aid in survival.

Key Concepts:

- Birds
- Habitats
- Adaptations
- Bills/Beaks



Bills & Beaks Activity

Instructions & Background

1. Before starting the activity, prepare the materials needed to demonstrate the bills and beaks challenges:

1. Fill three graduated cylinders with colored water.
2. Prepare a dish of oats with rubber worms buried throughout.
3. Spread sunflower seeds out in a pan.
4. Fill a dish of water and add green foam pieces to float in it.
5. Prepare a dish of water with loose-leaf tea or herbs.
6. Gather packing peanuts.
7. Tuck rice grains into the bark of the log.
8. Gather scrap paper or cardboard.

2. Distribute tools amongst the various challenges. The tools needed for each challenge are listed on the next page in the “Challenges and Corresponding Tools” section.

3. Once all challenges are prepared and tools distributed, discuss with students that each of the items in the challenge represents a type of food eaten by various birds. Ask students to think about birds they know and what types of foods those birds eat.

In this activity...

- Nectar (Colored Water) will need to be sucked out (Hummingbird).
- Worms (Rubber Worms) need to be dug and pulled out (American Avocet).
- Seeds (Sunflower Seeds) need to be cracked open (Yellow-headed Blackbird).
- Fish (Green Foam Pieces) need to be scooped out of the water (Pelican).
- Fine bits of vegetation (Tea or Herbs) will need to be carefully scooped out of the water (Ducks, Geese, Swans).
- Flying insects (Packing Peanuts) need to be caught in wide openings (Swallows).
- Small insects (Rice) will need to be picked and pried out of small crevices (Woodpeckers).
- Fish (Scrap Paper/Cardboard) which tool cuts through the best (Eagles).



Bills & Beaks Activity

Instructions & Background

4. Divide students into groups (there are eight challenges), and hand-out the "Fill the Bill Worksheet." You may need to make copies of the master worksheet found in this binder.
5. Assign students to their "challenges." Then, ask students to predict which "beak" (tool) will work best for "eating" their specific "food."
6. Give groups a couple of minutes to test their tools and fill out their worksheets. Rotate through each station.
7. Once students have tried all of the challenges, discuss as a whole class what the students discovered. Use the "Signs with Bird Pictures and Corresponding Activity Tool" to guide the discussion.

Challenges & Corresponding Tools

Challenge #1 – You have been given a graduated cylinder filled with colored water as a food source. You have also been given sample beaks (**Yarn, Eye Dropper, Straw**). Your challenge is to find out which "beak" it takes to get 5 mL of water most easily from the largest graduated cylinder to the smaller graduated cylinder.

Challenge #2 – You have been given rubber worms as a food source. You have also been given sample beaks (**Eye Dropper, Chopsticks, Wrench**). Your challenge is to find out which "beak" it takes to remove the rubber worms from the oatmeal.

Challenge #3 – You have been given sunflower seeds as your food source. You have also been given sample beaks (**Pliers, Chopsticks, Tweezers**). Your challenge is to find out which "beak" best cracks the shell and removes the seed inside.



Bills & Beaks Activity

Challenges & Corresponding Tools

Challenge #4 – You have been given green foam pieces as your food source. You have also been given sample beaks (**Chopsticks, Tweezers, Slotted Spoon**). Your challenge is to find out which “beak” it takes to remove all of the foam pieces from the water.

Challenge #5 – You have been given tea as your food source. You have also been provided sample beaks (**Slotted Spoon, Strainer, Tweezers**). Your challenge is to find out which “beak” it takes to get all of the tea from the water.

Challenge #6 – You have been given packing peanuts as your food source. You have also been provided sample beaks (**Tongs, Envelope, Chopsticks**). A group member will toss some peanuts in the air. Your challenge is to find out which “beak” captures the packing peanuts most easily. The packing peanuts must be caught while they are in the air.

Challenge #7 – You have been given rice as your food source. You have also been provided with sample beaks (**Eye Dropper, Tongs, Tweezers**). Your challenge is to find out which “beak” removes 15 grains of rice from the bark of a tree most easily.

Challenge #8 – You have been given paper/cardboard as your food source. You have also been provided sample beaks (**Chopsticks, Tongs, Scissors**). Your challenge is to find out which “beak” tears the object the best.



Fill the Bill Worksheet

Name: _____

*After testing out your “beaks” at each challenge, record which tool worked best for feeding and which bird the beak belongs to. Birds are listed below.

Challenge Number	Food Source	Best Feeding Tool	Bird
Challenge #1	Nectar in flower		
Challenge #2	Worms buried in mud		
Challenge #3	Seeds with hard shells		
Challenge #4	Fish swimming in water		
Challenge #5	Tiny plants floating in water		
Challenge #6	Flying insects		
Challenge #7	Caterpillars and other insects on a log		
Challenge #8	Fish or meat		



Hummingbird



Pelican



Warbler



Shorebird



Swallow



Eagle



Blackbird



Duck



Fill the Bill Worksheet (Teacher Copy)

Name: _____

*After testing out your “beaks” at each challenge, record which tool worked best for feeding and which bird the beak belongs to. Birds are listed below.

Challenge Number	Food Source	Best Feeding Tool	Bird
Challenge #1	Nectar in flower	Eye Dropper	Hummingbird
Challenge #2	Worms buried in mud	Chopsticks	Shorebird
Challenge #3	Seeds with hard shells	Pliers	Warbler
Challenge #4	Fish swimming in water	Slotted Spoon	Pelican
Challenge #5	Tiny plants floating in water	Strainer	Duck
Challenge #6	Flying insects	Envelope	Swallow
Challenge #7	Caterpillars and other insects on a log	Tweezers	Blackbird
Challenge #8	Fish or meat	Scissors	Eagle



Hummingbird



Pelican



Warbler



Shorebird



Swallow



Eagle



Blackbird



Duck



Reflection

Ask Students...

1. **Why do different species of birds have unique beak shapes?**
2. **Why is the shape of a bird's beak so important? Do you think this could impact the type of habitat a bird lives in? Why?**
3. **If you could have any beak/be any bird, what type of beak/bird would you choose and why?**