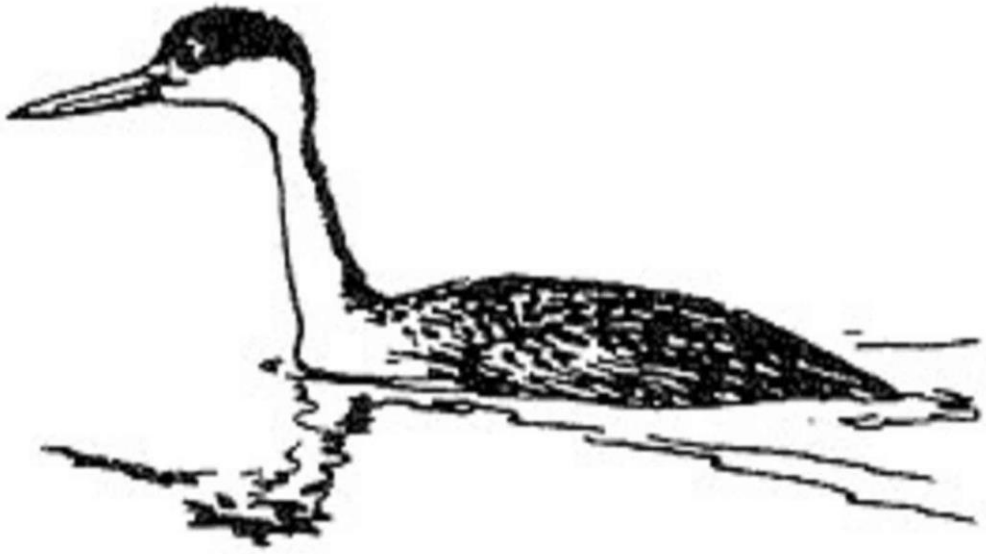
Build-A-Bird Adaptations Lessons



NATIONAL WILDLIFE REFUGE SYSTEM

Build-A-Bird

Season:
All

Objectives:
Students will be able to...

- Define the adaptations that all birds have and why they are important.

- Determine some of the differences between different species of birds and how these unique differences aid in survival.

Key Concepts:
- Birds
- Adaptations
- Habitats
- Flight
- Feathers
- Hollow Bones
- Air Sacs
- Beak

Summary of Activities

This binder includes a variety of activities and background information related to birds and their adaptations. 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.

Table of Contents (Binder)

State (SEEd) Standards

Kindergarten

Standard K.2, Living Things And Their Surroundings

Standard K.2.1, Obtain, evaluate, and communicate information to describe patterns of what living things need to survive.

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 2.2.2, Plan and carry out an investigation of the structure and function of the parts of living things 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.

Standard 4.1.2, Develop and use a model of a system to describe how animals receive different types of information from their environment through their senses.

Fifth Grade

Standard 5.3, Cycling Of Matter In Ecosystems

Standard 5.3.2, Obtain, evaluate, and communicate information that animals obtain energy and matter from the food they eat.

Build-A-Bird Trunk Materials List

Build-A-Bird Costume Items

- Cardboard Wings
- Camouflage Hat (2)
- Black Down Vest/Orange Puffy Vest
- Velcro Strip
- Sundress With Bird Pattern/Flower Scarf
- Fake Egg
- Pair of Garden Gloves (2)
- Black Scarf (2)
- Paper Towel Tube (3)
- Baby Oil Bottle (2)
- Balloons
- Red Paper Heart
- Magnifying Glass
- Sunglasses (2)
- Salad Tongs/Slotted Spoon
- Plastic Bag With Small Rocks
- Popcorn
- Oat Cereal

Miscellaneous Items

- Clothes Pins
- Pillowcase
- Deer Antler Pieces (2)
- Bird Feathers
- Build-A-Bird Adaptations Cards
- Build-A-Bird 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.

Build-A-Bird Lesson Plan

Shorebirds of Utah

American Avocet

Black-necked Stilt

Long-billed Curlew

Killdeer

Marbled Godwit

Wilson's Phalarope

Greater Yellowlegs

Short-billed Dowitcher

Build-A-Bird Lesson Plan

Raptors of Utah

Bald Eagle

Golden Eagle

Great Horned Owl

Barn Owl

Red-tailed Hawk

Northern Harrier

Peregrine Falcon

American Kestrel

Build-A-Bird Lesson Plan

Waterfowl of Utah

Mallard

Northern Shoveler

Cinnamon Teal

Green-winged Teal

Northern Pintail

Redhead

Common Goldeneye

Bufflehead

Songbirds of Utah

Yellow-headed Blackbird

Red-winged Blackbird

American Robin

Black-capped Chickadee

Mountain Bluebird

Mourning Dove

House Wren

Common Yellowthroat

Build-A-Bird

Time:
40 minutes

Season:
All

Objectives:
Students will be able to...

- Define the adaptations that all birds have and why they are important.

- Determine some of the differences between different species of birds and how these unique differences aid in survival.

Key Concepts:
- Birds
- Adaptations
- Habitats

Summary

All birds have unique and important adaptations that help them to live successfully in their chosen habitats. These adaptations are essential during annual activities such as migration and nesting.

In this activity, students will discover the purposes of the different adaptation's birds have and how these adaptations help birds in their chosen habitat.

Materials Included

- Cardboard Wings
- Camouflage Hat (2)
- Black Down Vest/Orange Puffy Vest
- Velcro Strip
- Sundress With Bird Pattern/Flower Scarf
- Fake Egg
- Pair of Garden Gloves (2)
- Black Scarf (2)
- Paper Towel Tube (3)
- Baby Oil Bottle (2)
- Balloons
- Red Paper Heart
- Magnifying Glass
- Sunglasses (2)
- Salad Tongs/Slotted Spoon
- Plastic Bag With Small Rocks
- Popcorn
- Oat Cereal
- Clothes Pins

Build-A-Bird Activity

Instructions & Background

1. To start the activity, gather all of the needed materials and supplies.

2. Ask for a student volunteer to become a shorebird.

3. Pass out the 18 "Build-A-Bird Adaptations Cards" to other students in the class. You may want to have students form groups or join a partner if there are not enough flashcards for each student.

4. Discuss with students that each of the cards represents an adaptation that serves an important purpose to birds in some way. Have them read their flashcard and try to decide why that adaptation may be important to birds.

5. Start creating/dressing-up the student volunteer by going through each card one-at-a-time. The student will slowly transform into a bird while the students learn why each adaptation is important.

6. While working through the activity, for each adaptation, ask the class questions such as...
    1. What is this adaptation?
    2. What might a bird need this adaptation for?

7. After discussing each adaptation, use a clothespin to attach the adaptation card to the costume piece the student volunteer is wearing.

Build-A-Bird Adaptations & Costume Parts

1. Wings (Cardboard Wings): All birds have wings. Wings are streamlined and provide the lift mechanism needed to obtain flight. The type of flight a bird does depends on the size and shape of its wings. This can include...
    Long/Broad Wings: Good for soaring.
    Short/Broad Wings: Good for maneuverability.
    Long/Narrow Wings: Good for speed.

Build-A-Bird Activity

Build-A-Bird Adaptations & Costume Parts

2. Feathers (Camouflage Hats, Black Down Vest, Orange Puffy Vest, Velcro Strip, Sundress With Bird Pattern, Flower Scarf): Birds are the only living animals with feathers. The feathers of a bird assist birds in flight. In addition to flight, birds also have specialized types of feathers that all serve different purposes…

Camouflage Hats: The color of a bird's feathers serve many important purposes. Many female birds are less brightly colored than male birds in order to blend in with their surroundings, using camouflage, and avoid being eaten by a predator.

Black Down Vest/Orange Puffy Vest: Down feathers help to insulate and keep a bird warm. These feathers are important for warm-blooded animals. These are soft feathers located nearest to the bird's body.

Velcro Strip: Contour feathers are stiff feathers that act as a bird's defense against physical objects, sunlight, wind, and rain.

Sundress With Bird Pattern/Flower Scarf: Many male bird species have brightly colored feathers that are meant to help attract a mate during the breeding season.

3. Eggs (Fake Egg): Birds are the only animals that lay hard-shelled eggs. The hard shell protects the developing baby bird and allows the parents to sit on the eggs during incubation.

4. Bones (Pair of Garden Gloves, Black Scarf, Paper Towel Tube): All birds have hollow bones. Hollow bones are lighter in weight and play a major role in birds' ability to fly. Thin internal braces within the bones allow them to remain strong as well as light. This strong but light frame is essential in supporting the large flight muscles of birds and their internal organs.

Pair of Garden Gloves: Many of the bones within a bird's skeleton are fused together. This helps to increase the strength of a bird.

* Each garden glove has five fingers. Take the masking tape and tape three of the fingers together. While humans have five fingers, birds only have three.

Build-A-Bird Activity

Build-A-Bird Adaptations & Costume Parts

Black Scarf: Birds have no outer ear flaps like many other animals. This streamline shape helps to reduce resistance from wind during flight.

*** Cover the ears of the student volunteer with the black scarf.**

Paper Towel Tube: All birds have hollow bones. Hollow bones are lighter in weight and contribute to a bird's ability to fly.

5. Oil Gland (Baby Oil Bottle): Most birds have a special oil gland called the uropygial gland located just above the base of the tail. Birds rub oil from this gland onto their feathers to help clean and waterproof their feathers.

6. Air Sacs (Balloons): Birds 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.

7. Large Heart (Red Paper Heart): Compared to mammal species, birds have relatively large hearts to circulate blood through their body efficiently. This helps birds to keep up with the high energy demands of flying.

8. Vision (Magnifying Glass, Sunglasses): Birds have much better vision than other animals. The large eyes of birds are able to focus sharply on both nearby and faraway objects. They can see color, and most have both monocular and binocular vision.

Magnifying Glass: Birds have great vision. Their large eyes can focus on objects that are both near and far.

Sunglasses: Birds have a third eyelid called the nictating membrane. This extra eyelid helps to keep the eyes of a bird clean and to protect the eyes during flight or when diving underwater.

Build-A-Bird Activity

Build-A-Bird Adaptations & Costume Parts

9. Beaks/Bills (Salad Tongs, Slotted Spoon): Each type of bird has a different type of beak. Birds mainly use their beaks to gather and eat food and to drink. Since birds do not have hands, they will also use their beaks to collect nest materials, preen and clean their feathers, scratch their bodies, and to defend themselves.

10. Digestion (Plastic Bag With Small Rocks, Popcorn, Oat Cereal): Many birds have a large sac, called a crop, at the bottom of their esophagus to store undigested food. The crop allows them to carry food away and slowly digest it later.

- Plastic Bag With Small Rocks: To help with the digestion process, most birds have a specialized muscular part of their stomach called a gizzard. The gizzard is used similar to how other animals use teeth. Gizzards help to grind up hard nuts, seeds, grains, and other harder food items.
- Popcorn/Oat Cereal: Birds excrete their waste in a solid white form. Pooping is often considered an adaptation for birds because the more a bird can excrete, the less a bird weighs, and the better a bird can fly.

Reflection

Ask Students...

1. In your opinion, which bird adaptation is the most important to their survival? Why do you think that is?

2. Why are birds so important? What is their role in the food chain and why are they important for the environment?

3. Why do different species of birds look so different? Why might they have slightly different adaptations?

4. If you could be any bird, what special adaptation would you have and why?