CINCINNATI ZOO & BOTANICAL GARDEN

Frisch's Outreach: Birds (4-6) Extensions

At a glance

This program will allow your students to gain further insight into birds and the adaptations that allow them to survive.

Goal

This class is designed to familiarize students with the many unique adaptations birds possess.

Objectives

1. Students will be able to list adaptations birds have that that other animals have, and those that no other animals have.
2. Students will be able to describe ways different birds catch and eat their food.
3. The students will develop a respect for animals and the natural world.

Theme

Birds have unique adaptations that help them survive in many different habitats.

Sub-themes

1. 1. Birds are very beneficial to people for many different reasons.
2. Birds have a wide variety of adaptations that are unique to their group.

Academic standards

Ohio Science Academic Content Standards	*Fourth Grade Standards* Life Sciences Diversity & Interdependence of Life 5 Scientific Ways of Knowing 1 *Fifth Grade Standards* Life Sciences Diversity & Interdependence of Life 4,5,6 Doing Scientific Inquiry 3 Scientific Ways of Knowing 1 *Sixth Grade Standards* Life Sciences Characteristics & Structure of Life 2

	Diversity & Interdependence of Life 8 Scientific Inquiry Doing Scientific Inquiry 3,4 Scientific Ways of Knowing Nature of Science 1 Science & Society 3
Kentucky Core Content—Science	Life Science: *Grades Primary through 4:* The Characteristics of Organisms: SC-E-3.1.2, SC-E-3.1.3 Life Cycle of Organisms: SC-E-3.2.2 Organisms And Their Environment: SC-E-3.3.1 Diversity and Adaptations of Organisms: SC-M-3.4.1, SC-M-3.5.2 *Grades 5-7* Regulation & Behavior SC-M-3.2.1 Populations & Ecosystems SC-M-3.5.1, SC-M-3.5.2 Structures & Function in Living Systems SC-M-3.1.1

Background

All birds have many things in common; they are all endothermic, air breathing vertebrates. They are the only class of animals that grow feathers. Birds also have hollow or partially hollow bones, preen glands, ears, beaks, and two lungs with special air sacs attached to each one.

Birds have feathers covering their bodies, instead of hair. There are different types of feathers on a bird. The feathers closest to the birds' body are down feathers, the bigger feathers all over the birds' body are contour feathers, and the big feathers on the tail and wings are flight feathers. Birds could also have show feathers (example: a crest).

All birds have wings, but not all birds can fly. Flighted birds have hollow bones, making them lighter, so it is easy for them to fly.

All birds lay eggs, they incubate (sit on the eggs to keep them warm) the eggs until hatched. They care for their young until they are ready to leave the nest and take care of themselves. This is called fledging.

All birds have beaks or bills. Their beaks aid them in eating the particular type of food they are after. Example, Birds of prey have sharp curved beaks used for tearing meat; while doves have small pointed beaks for picking up seeds, and herons have a pointed dagger-like bill for catching fish..

Some birds have talons, used for hunting live prey. Water birds have webbed feet for swimming. Others have feet perfect for perching on small branches.

Birds live in all parts of the world. Some make their homes in cold places near the North Pole. Others live in hot green jungles of South America or Africa. Some live in fields and other in the mountains. Others stay near water.

In colder areas, or in the winter time, we see birds fluff out their feathers. This helps keep them warm by trapping more air between the body of the bird and the outside feathers.

Birds have many ways of life. Some like swifts spend most of their waking hours flying. While the penguins waddle on the ice and swim in the ocean but can not fly. Many migrate very long distances at certain seasons.

Migration takes a lot of energy. Birds will build up fat reserves for the long journey. They use the sun, the moon, stars, and many birds can detect variations in the earth's magnetic field.

Many species are unable to fly, yet others are adapted to life on water. Birds feed on an incredible diversity of foods

such as seeds, fruit, insects, fish, and other animals. Certain birds are specialized to feed on certain foods items, even limiting themselves, for example, to the fruit or seeds of a particular plant.

Many birds are valuable to man. Chickens and other poultry provide meat and eggs for food. Birds help the farmers by eating insects that attack his crops or by eating the weed seeds that may choke a farmer's field. Some birds aid in pollination of plants. Many birds are useful in seed dispersal, thus spreading seeds for new plant life where there was none before; such as a newly cleared field or a recently formed volcanic land mass. Eider down collected from eider ducks makes bedding and the finest pillows.

There are about 8,600 different species of birds that are alive today. This diversity is reflected most obviously in the varied and often brilliant plumage patterns seen in birds. But this variation goes deeper, and one finds considerable diversity of anatomical structure and habits among birds.

Birds vary in size from the ostrich which may stand 8 ft. high to the smallest hummingbirds that measure no more than 2 ½ inch in length including a relatively long beak! The oldest know bird is Archaeopteryx. It is thought by some that birds evolved from reptiles, and the fossil of archaeopteryx shows that it had qualities of both reptiles and birds. This bird had wings and feathers, but had a toothed jaw/snout, rather than a bill, as well as a tail.

Vocabulary

Adaptations- (noun) - Something that helps an animal survive.

Behavior- Activity or change in relation to an environment; the way an organism acts in response to a stimulus.

Cold Blooded- pertaining to animals, as fishes and reptiles, whose blood temperature ranges from the freezing point upward, in accordance with the temperature of the surrounding medium.

Contour Feathers- medium size feathers that give a bird its shape, and help wind stream the bird for easy flight.

Display- A means of attracting attention.

Down feathers- smallest feathers, closest to the birds body

Ectothermic- cold blooded

Endothermic- warm blooded

Fledge- when baby birds leave the nest

Flight Feathers- the large tail feathers

Habitat- Natural home or dwelling place of an organism.

Hibernation- Spending the winter in close quarters, in torpid or lethargic state.

Migration- To pass periodically from one region or climate to another for feeding or breeding.

Mimicry- The superficial resemblance which some animals exhibit to other animals or to the natural objects among which they live; thereby, securing concealment, protection or the like.

Molting—the act or process of shedding the outer covering of the body or a part of it.

Movement- Change of place, position or posture; particular act or manner of moving.

Plumage—the entire covering of feathers of a bird.

Survival- Living or continuing longer than something else.

Vertebrate- having a backbone or spinal column.

Warm Blooded- pertaining to animals, as mammals and birds, whose blood ranges in temperatures from about 98° to 112°F (37° to 44°C) and remains relatively constant.

Extensions

Wing Flap
How many flaps per 10 seconds-
Have the students stand in an area that they can spread their wings (arms) out to their sides with out hitting anyone. Time them to see how many times they can flap their wings up and down in 10 seconds. Compare their results to other birds.
Crow……..20 beats/ 10 seconds
Robin…….....23
Pigeon……30
Starling……..45
Chickadee……..270
Hummingbird…700

Resources

Burnie, David. Animal. Dorling Kindersley. New York. 2001.

Doris, Ellen. Ornithology. Thames and Hudson, Inc. New York. 1994.

www.cincinnatizoo.org