



Activity: What Is a Bird?

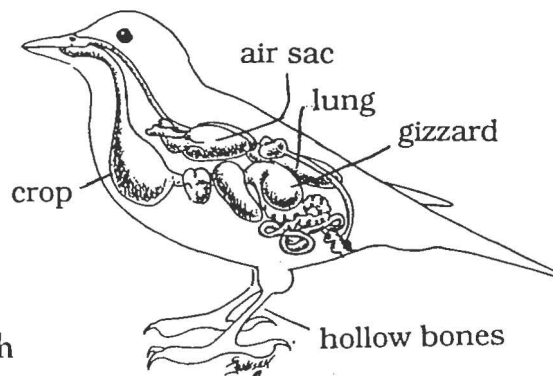
Objective: Students will study the characteristics that make a bird a bird.

Materials: None, although a mounted bird would demonstrate parts of this discussion. Borrow a mounted pheasant or duck from someone you know.

Background: Everyone knows what a bird is. We see them every day. Most of your students probably saw a bird this morning on their way to school. But what makes a bird a bird? What are the distinguishing characteristics that let you separate birds from other animals? This activity will help students separate birds from other vertebrates (animals with backbones). There is usually not a problem separating birds from invertebrates, although hawk moths and clear-winged moths are sometimes confused with hummingbirds because they make a humming sound when hovering over flowers.

Procedure: Ask your class to pretend that they are being visited by an alien from another planet who has no concept of what a bird is. Ask them to list the most important distinguishing characteristics of birds. Write the list on the board. It will get harder as the list gets longer; the easy ideas will surface first.

After completing your list, ask your students if any animals besides birds possess these characteristics. Discuss each characteristic. Obviously, any suggested characteristic that is not possessed by all birds is not as diagnostic as something that is true for all birds. (For example, not all birds fly.) Discuss whether any animals that are not birds have each characteristic.



Discuss the list again. At this point, the group should decide which of the characteristics really do distinguish birds from other animals.

Conclude this exercise by reviewing the list one last time to discuss the functions of the characteristics listed.

Follow this standard format::

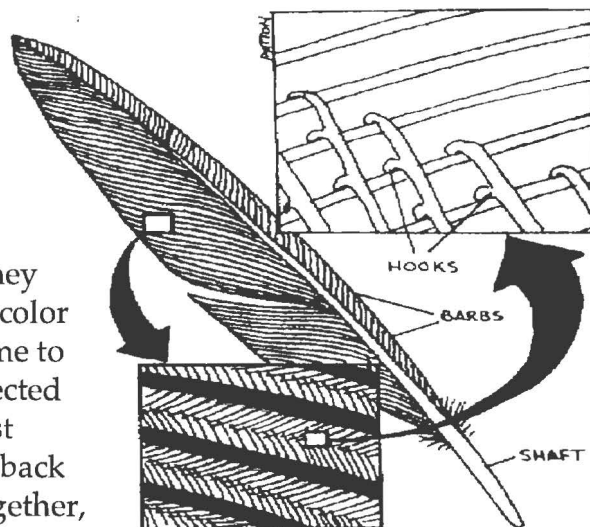
Characteristic

- a. Does this occur in all birds?
- b. Does this occur in any other animals?
- c. Why do animals do this or have this?



1. Feathers

- a. Yes. This is the one unique characteristic of birds. All birds have them, and no other animals have feathers as a body covering.
- b. No
- c. Feathers have many functions in birds. They clothe birds, keeping them warm and dry. By their color patterns, feathers can camouflage birds or allow some to show off. Their overall lightness and the interconnected barbs and barbules help make flight possible in most birds. Pulling apart an old feather and "zipping" it back up demonstrates how the barbs hold the feather together, while a feather's lightness, compared with an equal-sized piece of an airplane wing, is obvious. Feathers on different regions of birds' bodies serve different functions.



2. Wings

- a. Yes. Even flightless birds have wings, although they may be very small stubs.
- b. Yes. Bats and insects have wings.
- c. Wings allow true flight in most birds.

3. Flight

- a. No. Penguins, ostriches, and a number of other birds cannot fly.
- b. Yes. Bats and insects fly well.
- c. This method of locomotion is important to birds as a way to get food, escape enemies, and migrate each spring and fall.

4. Egg Laying

- a. Yes
- b. Yes. A few mammals, such as the duck-billed platypus, as well as most fish, insects, amphibians, and reptiles, lay eggs.
- c. Birds lay eggs to allow the next generation to develop outside of the mother's body. This frees the mother from carrying the weight of the eggs within her body. For some species, the weight of the clutch of eggs is quite heavy and certainly would slow down the female, and expose her to predators. The weight of the average bobwhite quail clutch is greater than the weight of the average bobwhite female! Laying eggs also allows the male bird to share sometimes in the incubation.





5. Migration

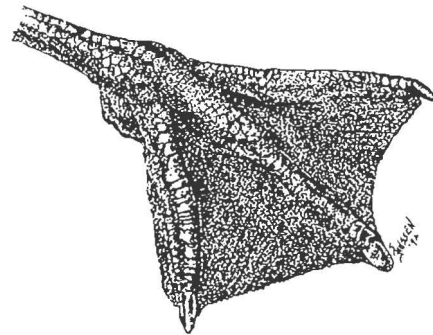
- a. No. House sparrows, cardinals, and many other birds do not migrate.
- b. Yes. Some bats, whales, seals, fish, crabs, monarch butterflies, and caribou, among others, migrate.
- c. Migration helps put animals in good habitats at the right time of the year. It allows animals to take advantage of seasonal differences in the environment. Most insect-eaters would have an impossible time finding food during Iowa's winters. But there are many insects in Iowa during the summer -- a food source so abundant that many birds, such as cardinals, survive over the winter by eating seeds and feeding on insects in the summer.

6. Feet Like a Bird

- a. Yes. But mentally compare a hawk's talons, a robin's foot, and a duck's foot. Birds' feet vary greatly. They can be completely webbed (pelican webs connect all four toes, while duck webs are only between the three forward-facing toes), partially webbed (some sandpipers have webbing that does not reach more than half-way to the toes), or lobed (grebes and coots). A bird may have normal nails at the end of their feet, or they may have strong, curved nails (talons on hawks). Birds can have two toes (ostriches), three toes (some sandpipers), or four toes (most birds). They can have a "normal" toe arrangement with three toes pointing forward and one toe to the rear or two toes can point forward and two toes to the rear (woodpeckers).
- b. Some lizards have feet which look very much like a bird's foot.
- c. Birds use their feet for many purposes -- to walk, to hold food, to carry things, and to propel them in the water.



Grebe foot



Duck Foot



7. Beaks or Bills

- a. Yes. They vary greatly in their size and shape.
- b. Turtles and some fish have horny beaks.
- c. Birds use their beaks for many purposes -- to catch and carry food, to tear food into bite-sized pieces, to feed their young, to build their nests, to drive away predators, and to comb their feathers.

8. Crop

- a. No. Not all birds have crops.
- b. No other animal has a crop, although some other animals store their food before digesting it, such as squirrels storing nuts in their cheek pouches.
- c. The crop is part of the esophagus, the tube that carries food from the mouth to the stomach. The crop is simply a widened section of the esophagus that serves mainly as a place to temporarily store food. It also may have other functions, including production of pigeon milk, sound resonance, and digestion of food.



9. Gizzard (instead of teeth)

- a. No. Most carnivorous (meat-eating) birds lack a gizzard; eagles and falcons do not have a gizzard.
- b. No. Insects, for example, do not chew with teeth as we do.
- c. The gizzard is actually part of the stomach. It is thick and heavy with muscle and often contains bits of gravel or sand called grit. Gizzards play the same role in birds as our teeth and jaws — to “chew” hard food such as seeds.

10. Nest

- a. No. Cowbirds make no nest but lay their eggs in the nests of others. Other birds, such as common nighthawks, merely lay their eggs on the ground and do not even scrape a few twigs together.
- b. Squirrels, mice, alligators, and even some fish build nests.
- c. Nests are structured to hold the eggs and later the young birds. The nest helps protect the eggs from predators, holds the eggs together so they can be incubated, and, in general, provides a safe place for the eggs and young.



**11. Sing**

a. No, or at best maybe. All birds make noise, but it would truly stretch most people's idea of song to call the noises of a red-tailed hawk, a blue jay, or a downy woodpecker a song.

b. Yes. Crickets, frogs, toads, monkeys, whales, coyotes, wolves, and humans sing.

c. The purpose of singing is to advertise possession of a territory or readiness to take a mate.

12. Colorful

a. Not really. Some birds, such as hen pheasants and both males and females of most species of sparrows, are very dull in color.

b. Some of the most colorful animals are insects, snakes, fish, and other marine creatures, such as anemones and jellyfish.

c. Color serves many functions in the animal world. It can be used to advertise for a mate, scare enemies, and allow other individuals to recognize the species of bird. Color can also help an animal hide from its enemies through camouflage.

13. Warm Blood

a. Yes. Scientists would describe warm-bloodedness as having a constant body temperature.

b. Yes. Mammals and at least a few species in several other groups are warm-blooded.

c. Constant body temperature allows activity when the environment cools off at night or in the winter. Another advantage is that the constant body temperature allows the body to run more efficiently. The body temperature of some birds drops at night, however, apparently to conserve energy. A hummingbird, for example, may drop its temperature as much as 50 degrees F. at night.

14. Hollow Bones

a. No. Surprisingly, some birds which do not fly and some diving birds have bones which, unlike most birds, are not hollow.

b. Although some mammal bones (especially the larger bones of the body) are hollow in the sense that they are not solid bone; the cavity in them is filled with marrow. They are not hollow in the sense of bird bones which are filled with air spaces.

c. Pneumatized hollow bones allow long avian bones to be light for their size. If you are going to fly, it is important to save weight wherever you can!



15. Oil Gland or Preen Gland

- a. No. Ostriches, some pigeons, and some parrots completely lack these glands.
- b. Certainly mammals have glands which secrete an oil, but these are scattered throughout the body. On a bird, a pair of oil glands is located on the back at the base of the tail.
- c. Most birds have a specialized gland located just above the base of the tail. A preening bird can be observed rubbing its bill around the opening of the gland, picking up a load of oil on the bill, and spreading the oil through its feathers as it preens. This is thought to play an important role in waterproofing and insulating a bird. Waterproofing also maintains feather flexibility and condition.

16. Two Legs

- a. This characteristic is certainly true for all birds. The ancestors of birds (probably small dinosaur-like reptiles) had four legs, but in birds, the front pair has become highly specialized for flight and is now called the wings.
- b. Yes. Children may suggest that humans and monkeys have two legs, but scientists would say they have four limbs -- two legs and two arms.
- c. Legs are used for locomotion. Even though legs are not the primary means by which most birds travel, they are still vitally important for almost all birds.

