

BIRD

Introduction

From pigeons in big cities to penguins in Antarctica, all birds have similar features. They all have wings, though they cannot all fly. All birds also have [feathers](#). In fact, birds are the only living [animals](#) that have feathers.

Birds have fascinated people throughout history. Many people keep birds as [pets](#) or enjoy watching them in the wild or at zoos. In addition, farmers raise [poultry](#) for their meat and eggs. Hunters shoot some birds as game. People also use bird feathers in various products and for decoration.

Where Birds Live

Birds are found almost everywhere on Earth. There are more than 10,000 species, or types, alive today. Different types have adapted to different habitats, from deserts to rain forests to cities.

Many birds [migrate](#), or fly long distances between their winter and summer homes. For example, many European birds travel to Africa for the winter. This helps them find enough food year-round.

Physical Features

Birds are warm-blooded. This means that their body temperature stays about the same, regardless of the temperature of their surroundings. Mammals, including humans, are also warm-blooded. However, birds are more closely related to the group of animals called reptiles than they are to mammals. In fact, many scientists think that birds developed from [dinosaurs](#), which were reptiles, millions of years ago.

Size and Color

Birds vary greatly in size. The bee hummingbird is the smallest living bird. It is only about 2.5 inches (6.3 centimeters) long and weighs less than 0.1 ounce (3 grams). The largest living bird is the ostrich. Some male ostriches can stand 8 feet (2.5 meters) tall and weigh 300 pounds (135 kilograms).

Feather colors range from drab to very bright. In many species the male is more brightly colored than the female. The female's dull coloring may help it remain hidden in the nest. In some cases, the brightly colored male perches a short distance away from the nest. In this way, the male bird draws the attention of enemies to himself and away from the eggs and young. The male's showy coloring may also help it attract a mate.

Flight and Basic Structure

Most birds can fly. They are able to do so because of their body structure and feathers. Flying birds are strong but light. Their powerful chest muscles help them flap their wings. Many of their bones are hollow, which keeps them light. Their compact bodies narrow toward the ends like jet airplanes. Air flows smoothly over their feathers while they fly.

However, a few types of bird cannot fly. Penguins have paddlelike wings that are useless for flying. But their wings help them swim well. Ostriches and similar flightless birds have small wings and weak chests. They walk or run everywhere on their strong legs. Most other kinds of bird can walk (or swim) and fly.

Every bird has two legs, two feet, and a bill. Many birds have a pouchlike area of the throat called the crop. The crop is used to store food. Many birds also have a gizzard, a part of the stomach that grinds up food. Birds lack teeth, so they cannot chew their food.

Feathers

Feathers help birds fly and protect them from water, heat, and cold. Birds rearrange and clean their feathers regularly. Most kinds also apply oil to the feathers from a gland near the tail. Water slides off the oiled feathers instead of soaking through. At least once a year birds shed their old feathers and grow new ones. This process is called molting.

Senses

Birds have sharp eyesight. For instance, an American kestrel flying 100 feet (30 meters) above a field can spot a grasshopper on the ground below. However, birds generally have a narrower range of hearing than humans do. Their sense of smell is usually not highly developed.

Behavior and Feeding Habits

Some types of bird live alone most of the time. Other types are more social. They may feed, sleep, fly, and nest in groups called flocks.

Birds use many different sounds to communicate with one another. For example, some baby chicks stop moving when their mother produces a danger call. Birds may sing to attract mates. They may also sing to announce that a certain patch of land belongs to them.

Birds eat a wide variety of foods. Many types eat insects. Some waterbirds catch fish. Birds of prey catch many kinds of animals, including other birds. Some birds, such as vultures, feed on dead animals and garbage. Many other types eat plant material, such as seeds and fruits.

Reproduction

Most birds breed at least once a year. Many types build nests for their eggs. A nest can range from a scrape in the sand to a cup of twigs and mud to a complex hanging basket. The female bird lays a set of anywhere from 1 to 20 eggs, depending on the species.

Most birds sit on their eggs to keep them warm. The eggs hatch into young birds in about 11 to 80 days, depending on the species. Some young birds can feed themselves almost immediately. Other types depend on their parents to provide their food for a time.

Article Reference: <https://kids.britannica.com/kids/article/bird/352857>

(1)

FA21-BSE-098

Instance Space $|X|$:-

Features :-

i - Warm-blooded

ii - Wings

iii - legs

iv - Lay eggs

Each feature has two possible values.

size of Instance space $|X| = 2 \times 2 \times 2 \times 2 = 16$

| X | Warm-blooded | Wings | legs | Lay eggs | Bird |
|-----|--------------|-------|------|----------|------|
| X1 | Yes | Yes | Two | Yes | - |
| X2 | Yes | Yes | Two | No | - |
| X3 | Yes | Yes | Four | Yes | - |
| X4 | Yes | Yes | Four | No | - |
| X5 | Yes | No | Two | Yes | - |
| X6 | Yes | No | Two | No | - |
| X7 | Yes | No | Four | Yes | - |
| X8 | Yes | No | Four | No | - |
| X9 | No | Yes | Two | Yes | - |
| X10 | No | Yes | Two | No | - |
| X11 | No | Yes | Four | Yes | - |
| X12 | No | Yes | Four | No | - |
| X13 | No | No | Two | Yes | - |
| X14 | No | No | Two | No | - |
| X15 | No | No | Four | Yes | - |
| X16 | No | No | Four | No | - |

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Concept Space IC1:-

$$|C1| = 2^{|I \times I|} = 2^{16} = 65,536$$

| X | Warm-blooded | Wings | legs | lay eggs | Bird |
|-----|--------------|-------|------|----------|------|
| x1 | Yes | Yes | Two | Yes | 0 |
| x2 | Yes | Yes | Two | No | 1 |
| x3 | Yes | Yes | Four | Yes | 6 |
| x4 | Yes | Yes | Four | No | 0 |
| x5 | Yes | No | Two | Yes | 0 |
| x6 | Yes | No | Two | No | 0 |
| x7 | Yes | No | Four | Yes | 0 |
| x8 | Yes | No | Four | No | 0 |
| x9 | No | Yes | Two | Yes | 0 |
| x10 | No | Yes | Two | No | 0 |
| x11 | No | Yes | Four | Yes | 0 |
| x12 | No | Yes | Four | No | 0 |
| x13 | No | No | Two | Yes | 0 |
| x14 | No | No | Two | No | 0 |
| x15 | No | No | Four | Yes | 0 |
| x16 | No | No | Four | No | 0 |

③

| | | | |
|---|---|---|---|
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |

C1

| | | | |
|---|---|---|---|
| 1 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |

C2

| | | | |
|---|---|---|---|
| 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |

C3

| | | | |
|---|---|---|---|
| 1 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |

C4

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| | | | |
|---|---|---|---|
| 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 0 |

C65, 535

| | | | |
|---|---|---|---|
| 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 |

C65, 536