

Van Oord (A): Where Land And Water Meet

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Bird species live in most environments.

There are birds in all the corners of the world, on the ground, in the air, and in the water.

Some birds live in the mountains, some in the desert, some in the rain forest, some in the tundra, some in the city, some in the ocean, and some in the sky.

They can fly, they can swim, they can walk, they can run, they can crawl, they can climb, they can dig, they can burrow, they can hide, they can fly, they can swim, they can walk, they can run, they can crawl, they can climb, they can dig, they can burrow, they can hide.

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Birds can maintain body temperature.

Birds are endotherms, which means they regulate their body temperature internally.

Maintaining temperature allows endotherms to live in places where ectotherms like reptiles and amphibians cannot.

When an endotherm's body is cold, its systems slow down. It becomes less active, and it is unlikely to reproduce.

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Most birds can fly.

Adaptations of Flight

Birds have several adaptations that allow them to fly. These include feathers, wings, and a lightweight body.

Benefits of Flight

Flight allows birds to escape predators, find food, and migrate. It also allows them to travel long distances and reach new habitats.

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Birds lay eggs with hard shells.

Birds reproduce sexually.

In most bird species, the male performs a display and the female selects a mate.

The reproductive process of birds is similar to that of reptiles.

After fertilization, a shell forms around each cell. The egg shell is made of calcium carbonate and is covered with a protective layer called the chorion.

Usually the female bird chooses where to lay the eggs, often in a nest. The nest is built either by the male, the female, or both.

Bird eggs have to be kept in a constant, warm temperature so they will not die.

Birds sit on their eggs to keep them warm, called incubation.

Birds care for young until they can meet their own needs.

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Objectives

You will learn:

- About birds as endotherms.
- How the adaptations of birds allow them to live in many environments.
- About adaptations for flight.



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Most birds take care of their offspring.

In some species, the male and female mates take care of their offspring together.

Some birds hatch before their eyes open and their feathers grow.

Others hatch at a later state of development, with open eyes. They are already covered with down feathers and are able to walk.



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Bird species live in most environments.

There are birds in all the corners of the world, from the arctic to the tropics.

Some bird species are adapted to live in very harsh environments, like the albatrosses that live in the middle of the Pacific Ocean, where they can't find any other source of food.

Other birds are adapted to live in very warm environments, like the toucans that live in the rainforests of Central and South America.

There are also birds that live in the desert, like the roadrunners that live in the southwestern United States.

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Birds can maintain body temperature.

Birds are endotherms, which means they regulate their body temperature internally.

Maintaining temperature allows endotherms to live in places where ectotherms like reptiles and amphibians cannot.

When an endotherm's body is cold, its systems slow down. It becomes less active, and it is unlikely to reproduce.

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Most birds can fly.

Adaptations of Flight

Birds have several adaptations that allow them to fly. One of the most important is their wings. The wings of a bird are made of feathers, which are made of a protein called keratin. The feathers are attached to the bones of the wings, and they are held together by a network of muscles and tendons.

Benefits of Flight

Flight allows birds to escape predators, find food, and migrate. It also allows them to travel long distances without getting tired. Many birds are able to fly for hours at a time, and some can fly for days.

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Birds lay eggs with hard shells.

Birds reproduce sexually.

In most bird species, the male performs a display and the female selects a mate.

The reproductive process of birds is similar to that of reptiles.

After fertilization, a shell forms around each of the egg cells. It is called the eggshell.

The eggshell is made of calcium carbonate, but the shells of birds' eggs are hard.

Usually the female bird chooses where to lay the eggs, often in a nest. The nest is built either by the male, the female, or both.

Bird eggs have to be kept in a constant, warm temperature so they will not die.

Birds sit on their eggs to keep them warm, called incubation.

Birds care for young until they can meet their own needs.

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You will learn:

- About birds as endotherms.
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Bird species live in most environments.

- There are over 10,000 species of the vertebrate animals called birds.
- Some bird species are adapted to live in a wide range of environments. Many birds travel long distances during their lives. Some migrate as the seasons change, and others cover long distances while searching for food.
- Birds are distinguished by these characteristics:
 - They have feathers and a beak.
 - They have four limbs: a pair of scaly legs and a pair of wings
 - Their eggs have hard shells.



Birds can maintain body temperature.



-Birds are *endotherms*: animals that maintain a constant body temperature.

-Maintaining temperature allows endotherms to live in places where ectotherms like reptiles and amphibians cannot.

-When an ectothermic animal is cool, its systems slow down, it becomes less active, and it is unlikely to reproduce.

Generating Heat

- The energy birds produce as body heat comes from food.
- Most endotherms need to eat a lot.



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Controlling Body Temperature

- Birds have soft feathers, called down, that keep warm air close to their bodies.
- Other feathers, called contour feathers, cover the down on birds.
- Contour feathers are water-resistant.
- Birds shiver when they're cold, which generates body heat.
- Birds have behaviors for maintaining body temperature, such as resting in a shady place or fluffing their feathers.



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Most birds can fly.

Adaptations of Flight

-Many adaptations and many millions of years were needed before birds' body plans and systems became capable of flight.

-Endoskeleton: Some of the bones in a bird's body are fused instead of jointed, making those parts of the bird's body light and strong but not as flexible. A specialized bone supports the bird's flight muscles.

-Wings and Feathers: Birds have no hands on their wings. Contour feathers along the wing are called flight feathers.

-Specialized Respiratory Systems: Flying takes a lot of energy, so birds have to breathe using a system of air sacs and lungs.

-Hollow Bones: Many of the bones in a bird's body are hollow and contain crisscrossing structures that provide strength and less weight.

-An internal organ called a gizzard grinds up food.

-Birds have highly developed senses of hearing and vision.



Benefits of Flight

-Flight allows animals to get food from places where animals living on land or in water cannot. Also, a flying bird can search large areas for food more effectively than it could if it walked, ran, or swam.

-For many species of birds, flight makes migration possible, and some birds even migrate long distances.

- By flying, birds can escape danger on the ground.

-Eggs are laid where predators can't reach.



Birds lay eggs with hard shells.

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- Birds reproduce sexually.
- In most bird species, the male animals display and the female selects a mate.
- The reproduction process of birds is similar to that of reptiles
 - After fertilization, a shell forms around each fertilized egg while it is still inside the female's body.
 - Reptiles usually have flexible shells, but the shells of birds' eggs are hard.
- Usually the female bird chooses where to lay the eggs, often a nest. The nest is built either by the male, the female, or both.
- Bird eggs have to be kept at a constant, warm temperature or they will not develop.
- Birds sit on their eggs to keep them warm; called incubation.
- Birds care for young until they can meet their own needs.