

What Are Birds and Mammals?

Chapter 2 Lesson 4

ByDesign Science, Level 5
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Birds and Mammals

- ◆ What is the first thing you observe about the two animals on this page?
- ◆ A first look most likely shows they are vertebrates.
- ◆ The snowy owl, which lives in Canada, Alaska and the northern United States, has white plumage for camouflage in the snow.



- ◆ Its feathers provide warmth for its feet in the icy weather.

Birds and Mammals

- ◆ The Siberian tiger, which lives in Siberia and Manchuria, preys on red deer, wild boar, and antelopes.
- ◆ Because of its huge size, it does not fear other four-legged animals.



- ◆ The owl is a bird, while the Siberian tiger is a mammal.



- ◆ Yet these animals share characteristics.

Birds and Mammals

- ◆ They are endothermic, which means their body temperatures do not depend on their surroundings.
- ◆ So, whether the snowy owl is in Canada or somehow makes it way south to warmer temperatures, its body keeps a nearly constant body temperature.



- ◆ The same is true for the Siberian tiger.



Birds and Mammals

- ◆ Birds and mammals have high rates of metabolism, the combined chemical activities of the body's cells.
- ◆ This helps them produce more heat than animals such as reptiles and fish.
- ◆ They also have developed other ways to keep their bodies heated.



Birds



- ◆ Birds are one class in the phylum Chordata.
- ◆ If you were to observe a hummingbird and an ostrich, however, you might not realize they are in the same class.
- ◆ Birds possess a great deal of variety in size, coloring, and other parts among the 10,000 species.
- ◆ In addition, birds live in a variety of habitats on land and water.

Birds:

Characteristics

- ◆ While there is considerable variation in birds, they share the following characteristics:
 - ◆ Feathers
 - ◆ Wings
 - ◆ Air Sacs
 - ◆ Lack Teeth
 - ◆ Lay Eggs
 - ◆ Endothermic
 - ◆ Most have Hollow Bones
 - ◆ Flight (except flightless birds)



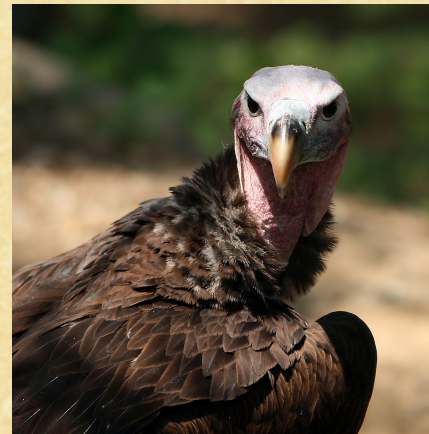
Birds: Categories

- ◆ Bird species are classified into 28 orders.
- ◆ However, most birds can be classified into four general categories.



Birds: Categories

- ◆ Category 1:
 - ◆ Birds of Prey
- ◆ Characteristics:
 - ◆ Sharp, curved claws and beaks
- ◆ Examples:
 - ◆ Eagles
 - ◆ Owls
 - ◆ Hawks
 - ◆ Vultures



Birds: Categories

- ◆ Category 2:
 - ◆ Perching Birds
- ◆ Characteristics:
 - ◆ Feet adapted for climbing and gripping branches
- ◆ Examples:
 - ◆ Sparrows
 - ◆ Robins
 - ◆ Starlings
 - ◆ Mockingbirds



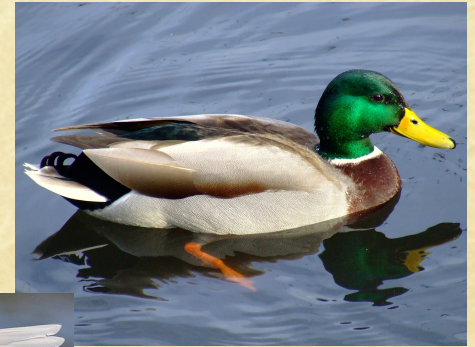
Birds: Categories

- ◆ Category 3:
 - ◆ Flightless Birds
- ◆ Characteristics:
 - ◆ Feet adapted for running and walking
 - ◆ Some are skilled swimmers
- ◆ Examples:
 - ◆ Ostriches
 - ◆ Penguins
 - ◆ Kiwi
 - ◆ Rheas

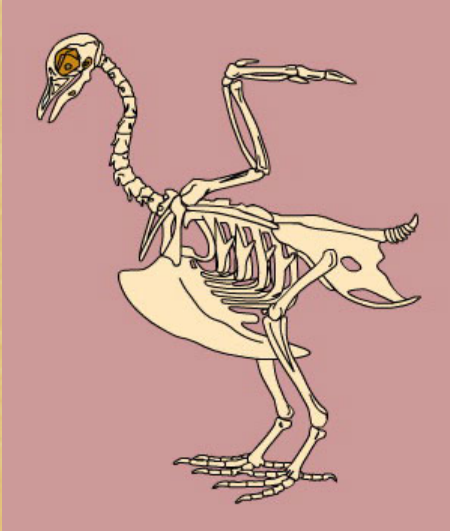


Birds: Categories

- ◆ Category 4:
 - ◆ Water Birds
- ◆ Characteristics:
 - ◆ Webbed feet adapted for swimming
 - ◆ Long legs adapted for wading
- ◆ Examples:
 - ◆ Ducks
 - ◆ Swans
 - ◆ Sandpiper
 - ◆ Pelicans

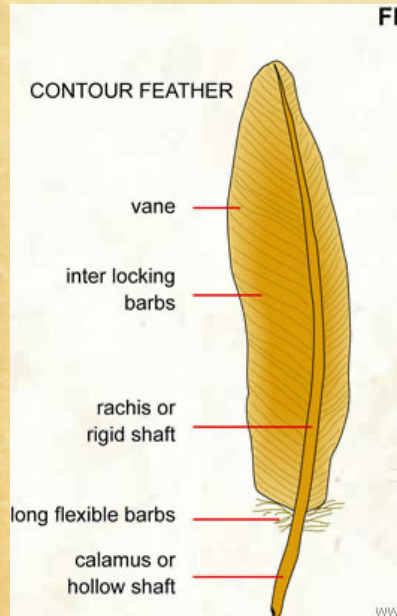


Birds: Structure



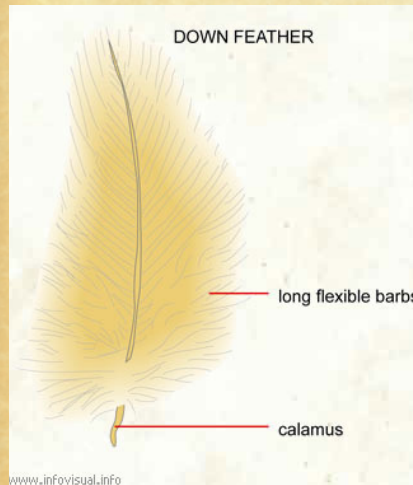
- ♦ Flying birds must have body structures that are both strong enough and light enough so they can move easily through the air.
- ♦ Flightless birds have other adaptations.
- ♦ Feathers grow from the bird's skin.

Birds: Structure



- ◆ The following are four main types of feathers:
 - ◆ **Contour feathers:** smooth feathers covering the head, body, and wings; help birds fly; give birds' bodies shape and color; protect them from the Sun, wind, and rain.

Birds: Structure



- ◆ The following are four main types of feathers:
 - ◆ Contour feathers
 - ◆ Down feathers: soft and fluffy; hold in body heat so bird stays warm; under contour feathers next to a bird's skin

Birds: Structure



- ◆ The following are four main types of feathers:
 - ◆ Contour feathers
 - ◆ Down feathers
 - ◆ *Filoplumes*: hair-like feather with few bards; decorative

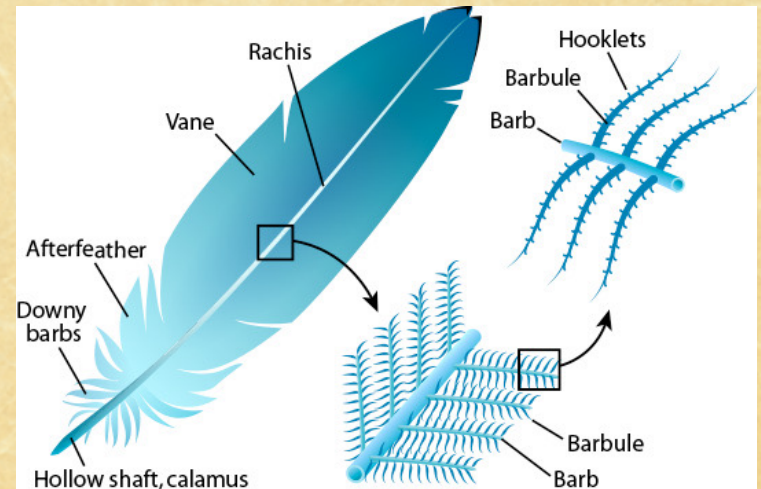
Birds: Structure



- ◆ The following are four main types of feathers:
 - ◆ Contour feathers
 - ◆ Down feathers
 - ◆ *Filoplumes:*
 - ◆ *Bristles:* short, hair-like; near bird's nostril to keep out foreign particles

Birds: Structure

- ◆ There are six parts to a feather.
 - ◆ *Vane*
 - ◆ *Quill*
 - ◆ *Barbs*
 - ◆ *Barbules*
 - ◆ *Rachis*
 - ◆ *Afterfeather*: fluffy barbs that do not interlock



Birds: Structure

- ◆ Most birds have hollow bones with air spaces that make the bones lighter.
- ◆ Within the hollow bones are inside supports that make the bones strong.



- ◆ Some birds, like the loon, have solid bones.

Birds: Structure



- ♦ Wings are powerful structures that allow some birds to fly quickly.
- ♦ Penguins use their wings to swim through the water.

Birds: Structure



- ♦ A bird's beak varies depending on the food it eats.

Birds: Behaviors

- ◆ Birds have complex behaviors when it comes to courtship, building nests, caring for their young, and migration.
- ◆ Male and female birds stay together during the time when they are ready to reproduce.



- ◆ Usually the male draws the female's attention through courtship rituals.
- ◆ Their rituals may involve songs, dances, and flight displays.

Birds Mating Dance

BBC Planet Earth



Birds: Behaviors



- ◆ Birds lay eggs with hard shells.
- ◆ Usually, the female sits on the eggs to keep them warm until they hatch.
- ◆ In many species, both males and females keep the eggs warm.
- ◆ Adults care for their young, but the level of care a young bird receives depends on how developed it is when it is hatched.

Birds: Behaviors

- ◆ Some birds hatch with their eyes open and can find their own food after hatching.
- ◆ They leave the nest in a short time, but they are still highly dependent on their parents.
- ◆ Other birds hatch with their eyes closed, do not leave the nest right away, and are fed by their parents.



Birds: Behaviors

- ◆ Many bird species will travel long distances when winter approaches.
- ◆ Then, they will travel again when spring arrives.
- ◆ The seasonal movement from one location to another is migration.
- ◆ Year after year, birds migrate over the same paths, called migration routes.

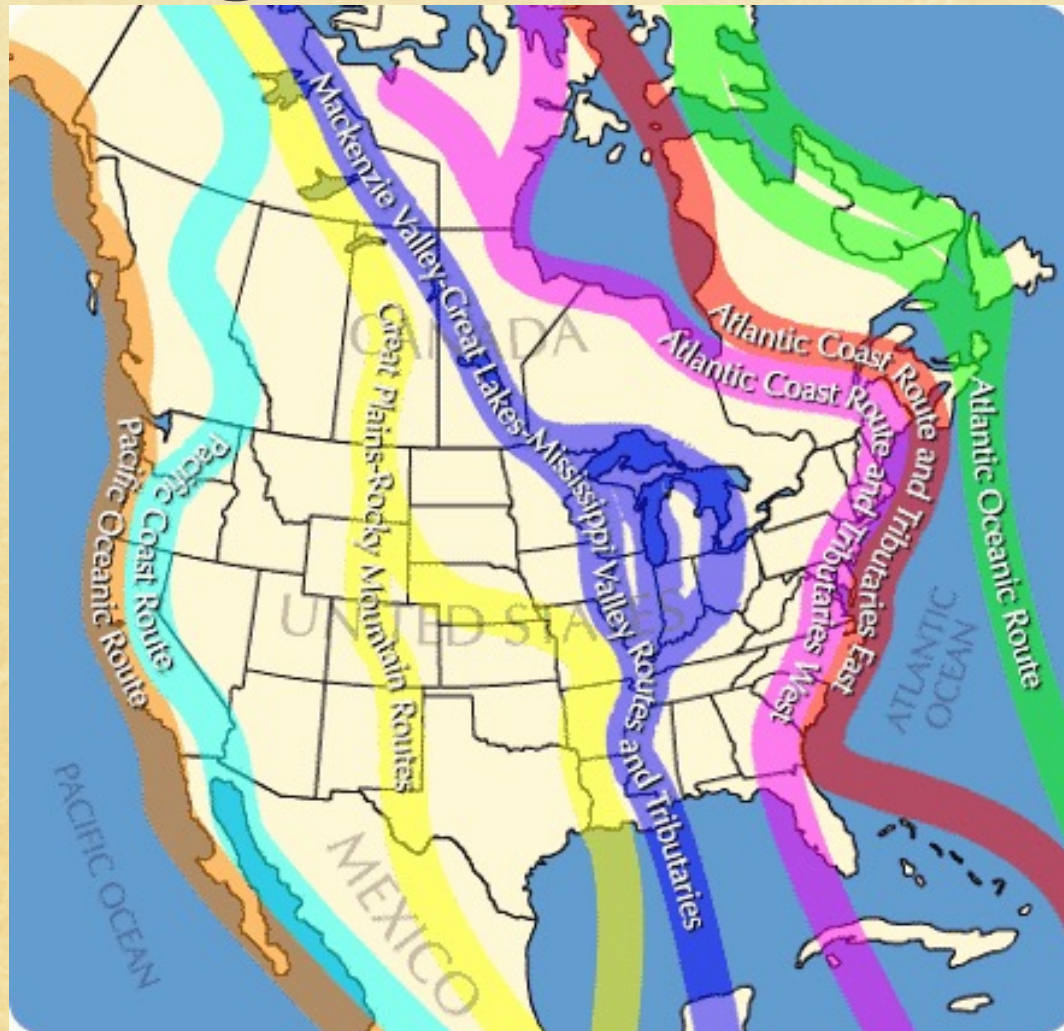


Birds: Behaviors



- ◆ Birds may find their way by recognizing specific landmarks, such as lakes and mountains.
- ◆ Birds also use Earth's magnetic field in navigation.
- ◆ They also may follow the Sun and other stars or star groups.

North American Bird Migration Routes



Birds



Mammals



- ◆ Mammals range in size from the tiny bumble bee bat of Thailand that is less than 1.3 in. long and has a mass of only .7 oz.
- ◆ To the massive blue whale that has a length of more than 82 ft. and a mass of more than 200,000 lb.



Characteristics of Mammals

- ◆ While there is a great diversity in mammals, they all share several basic characteristics.
 - ◆ Have hair or fur
 - ◆ Females have mammary glands to nurse their young
 - ◆ Have specialized bones in the ear
 - ◆ Give live birth (except platypus and echidna, which lay eggs)
 - ◆ Young cared for by parents
 - ◆ Have diaphragm for expanding the lungs
 - ◆ Have a four-chambered heart
 - ◆ Are endotherms



Characteristics of Mammals

- ◆ Different kinds of mammals have special characteristics that allow them to feed on different types of foods.
- ◆ Mammals fall into one of the three eating categories.



Characteristics of Mammals

- ◆ Herbivore Mammals:
 - ◆ Eat plants
 - ◆ Have large flat teeth for grinding up plants
 - ◆ EX: deer, sheep, horses, cows, elephants, mice, squirrels.



Characteristics of Mammals

- ◆ Carnivore Mammals
 - ◆ Eats animals
 - ◆ Sharp claws and strong limbs to capture prey
 - ◆ Sharp, pointed teeth for killing and holding prey and for biting into meat
 - ◆ EX: coyotes, bobcats, lions, wolves, dogs



Characteristics of Mammals

- ◆ Omnivore Mammals
 - ◆ Eats both plants and animals
 - ◆ Flat teeth for grinding plants and pointed teeth for biting into meat
 - ◆ EX: bears, raccoons, pigs, monkeys, rats



Behaviors of Mammals

- ◆ Mammals generally reproduce and care for their young in similar ways.
- ◆ However, other patterns of behavior are different for each species.



- ◆ Some mammals, such as wolves, live in social groups to hunt and remain safe.
- ◆ Other mammals, such as tigers, are solitary.

Behaviors of Mammals

- ◆ Mammals reproduce when male and female gametes combine.
- ◆ The fertilized egg remains within the mother's body for a set time, depending on the species.
- ◆ At birth, mammals are not able to survive on their own.
- ◆ Adult mammals must care for their young. Parents need to care for their offspring while they learn how to get food and remain safe from predators.



Behavior of Mammals

- ◆ If you own a male dog, then you may already know about mammals that are territorial.
- ◆ Some mammals claim a certain area as their own and defend it against other animals of their species.



- ◆ Some mammals are not territorial, but instead have a home range.
- ◆ This is the area through which they travel to do their normal activities.

Behaviors of Mammals

- ◆ Just as birds migrate, many mammals travel over large distances as the weather turns cold.
- ◆ They may be seeking food or better living conditions.



Behaviors of Mammals

- ◆ Some mammals, such as gray whales, travel so their young can be born in better and safer conditions.
- ◆ These mammals leave the cold, arctic waters and migrate more than 5,600 mi to the coast of Mexico or California.
- ◆ Their young can be born in warm waters.



Behaviors of Mammals

- ◆ Caribou of Canada and Alaska migrate as much as 684 miles twice each year.
- ◆ Caribou that are pregnant being migration in the spring around the same time as the snow melts.
- ◆ Their summer home provides food to help the new calves and other caribou grow strong and healthy.
- ◆ As winter arrives, the summer range becomes harsh and windy, so the caribou migrate back to areas where conditions are better



Main Groups of Mammals

- ◆ Mammals can be grouped by the way their young develop before they are born.
- ◆ A monotreme is an egg-laying mammal.
- ◆ A mammal within this group develops within a protective shelled egg, the way reptiles develop.



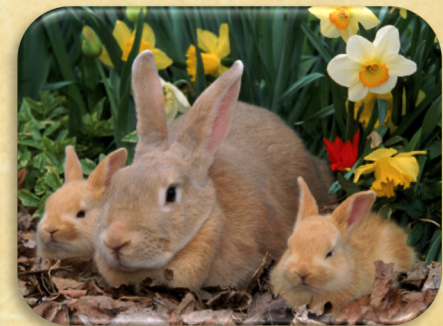
Main Groups of Mammals

- ◆ A marsupial is a pouched mammal.
- ◆ A mammal in this group develops within the mother's body for a short time.
- ◆ When a marsupial is born, it completes its development inside a special pouch located on the mother's abdomen.



Main Groups of Mammals

- ♦ A **placental mammal** is one in which the young develop completely within the mother's body.
- ♦ An organ known as the placenta connects the unborn young to the mother.



Ways Mammals Give Birth



Scripture Spotlight



What mammals are mentioned in 1 Kings 10:22? Whose
where they?

Scripture Spotlight



What mammals are mentioned in 1 Kings 10:22? Whose where they?

1 Kings 10:22 describes King Solomon's fleet of trading ships that brought him treasures every three years. It mentions apes and, depending on the translation, either monkeys or peacocks!

Mammals

