BIRDS AND MAMMALS

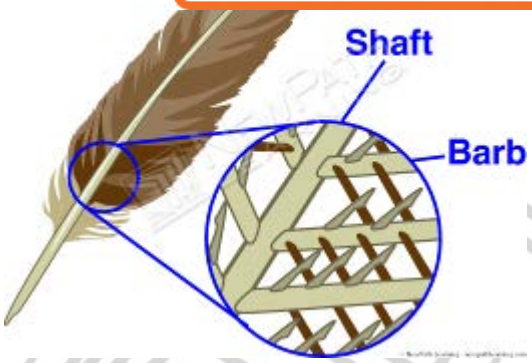
Characteristics of Birds

A **bird** is an endothermic vertebrate that lays eggs, has feathers, and has a four-chambered heart. Most birds have the ability to fly and have scales on their legs and feet. This is evidence that they are closely related to reptiles.

Our modern birds, including those that are not able to fly, evolved from organisms that could fly.

Lesson Checkpoint:
What adaptation allows a bird to fly?

A bird's body is adapted for flight. Their bones are lightweight and nearly hollow, they have large chest muscles, their forelimbs form wings, and they have feathers. If an organism has feathers, then it is a bird. Bir d to serve a specific p
One type o **ather** is large and balance and help it



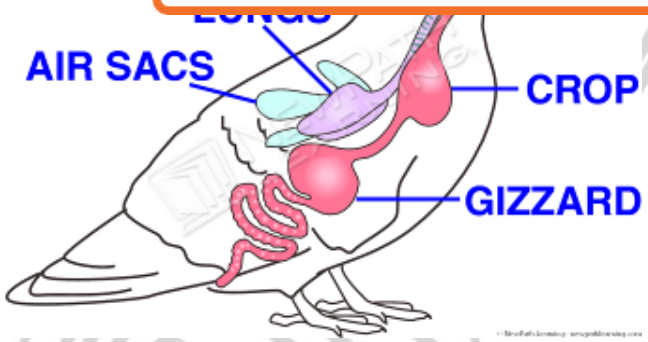
The other type of feather is called a down feather. **Down feathers** trap heat and keep a bird warm in its environment.

Down feathers are found next to a bird's skin and overlap, trapping air and insulating the bird. An **insulator** does not conduct heat and therefore keeps warm air from escaping.

Digestion

If you remember seeing a bird, chances are that you noticed that a bird does not have teeth. Instead, they have a structure called a bill. As we learned in Topic 8, a bird's bill is adapted to the type of food that it eats.

After eating, food is stored in a structure called its **crop**. A crop allows a bird to st ext stop for food, w l next enter the **g** ueezes and grinds what the teeth of ot



Breathing

Because birds are endothermic, they need to use a lot of energy to maintain body temperature. This means that they must eat a large amount of food to be able to produce a high amount of energy daily. The high energy demand means birds have a high demand for oxygen to be able to release the energy stored within the food. This requires a very efficient method of getting oxygen to the cells. Birds evolved air sacs, which allow them to take in more oxygen for every breath of air.

Circulatory System

The circulatory system of birds is also adapted to be efficient in supplying the cells with plenty of oxygen. The hearts of birds have four chambers that consist of two atria and two ventricles.

The advantage of the four-chambered heart is that the oxygen-poor blood is not able to mix with the oxygen-rich blood. This increases the amount of oxygen that gets into the body. The brain and the senses of sight and sound of birds are highly developed. This is because flying is nc to develop or

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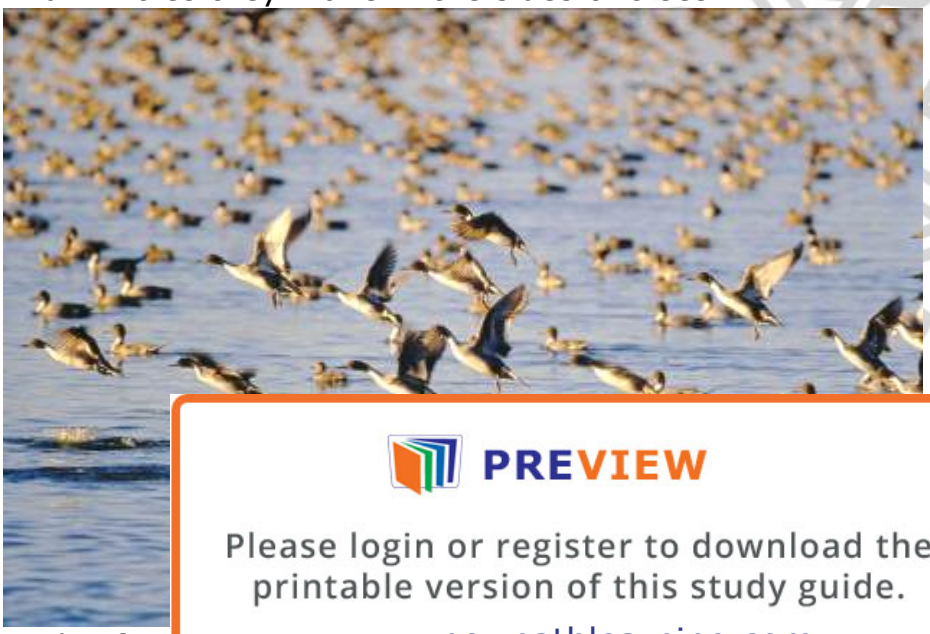
The egg will only continue to develop if the egg stays at or near the temperature of the parent's internal temperature.

This means that the eggs need to be incubated by the parent bird to keep the eggs at a temperature that is nearly the same. The length of time that it takes for an egg to hatch varies between the different species. When the bird is ready to hatch out of its shell, it will peck its way through the shell.

Diversity of Birds

Birds are the most diverse land vertebrates with almost 10,000 different species.

Birds have adapted to their environments by the size and shape of their eggs, claws, and bills. Woodpeckers feed on the insects that they find in holes they make in the sides of trees.



Birds of pr ight until they see p rey on the ground.

Flight-less birds like the ostrich of Africa are the largest modern bird. Instead of flight, it adapted to its environment by having the ability to run at high speeds. Bee-eaters catch their insect prey while flying through the air. Long-legged waders generally catch prey by combing the water with its long bill. Owls adapted to hunting at night. Their eyesight and hearing are very sharp and help them to find prey in the darkness.

Characteristics of Mammals

A **mammal** is an endothermic vertebrate that has skin covered with fur or hair, a four-chambered heart, a wide arrangement of teeth, and young that are born alive and feed by milk that was produced by the mother's body.

All mammals have hair or fur during the course of their lives. Hair and fur is an adaptation to prevent the loss of heat in environments that can be cold. Hair is grown by specialized living cells in the skin and is made up of dead cells. The actual amount of hair that a spe s.

Hair or fur growth are adaptations that allow mammals to live in cold climates. Without the hair or fur it would not be possible.

Feeding

Mammals gain the energy to produce heat for their bodies from the food that they eat. Teeth have adapted to increase the efficiency of digesting the food that is eaten.

Four Types of Teeth in Mammals

There are four different types of teeth among the species of mammals.

There are **incisors**, which have a flat edge and are used to cut and bite their prey. **Canines** are teeth that have a sharp point and are used to stab and tear food. The **premolars** and **molars** are teeth that grind and shred food into smaller and smaller pieces.

The teeth of a species indicate the type of food that a species feeds on. The presence of developed canine teeth normally means that the species are carnivores because canines are used to stab and hook into prey.

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Nervous System

The nervous system is highly developed and has adapted to the lifestyle of each individual species. The highly developed nervous system of a mammal allows them to move swiftly through their environment with accuracy.

Fertilization of Mammals

Fertilization occurs in mammals internally. There are a few species that lay eggs that are shelled, but most offspring are developed within the mother. Milk is also produced within the mother and is fed to the offspring after being born. Mammals got their name from the glands that produce milk, called **mammary glands**.

Diversity of Mammals

There are approximately 6,000 different species of mammals that exist today. The majority of mammals live on land, but some species adapted to live in the air and in the oceans. There are three groups of mammals, according to how their young develop.

Three groups of mammals

They are **monotremes**, **marsupials**, and **placental** mammals.

The **monotremes** are very strange mammals that lay eggs. There are only three montreme species: two are spiny anteaters and the other is a duck-billed platypus.

Marsupials are mammals that are born at an early stage of development and usually continue development in the pouch of the mother's body. Kangaroo's and Opossums are examples of marsupials

Placental inside the mother's b he organ that passe called the **placenta**. mans are all exampl