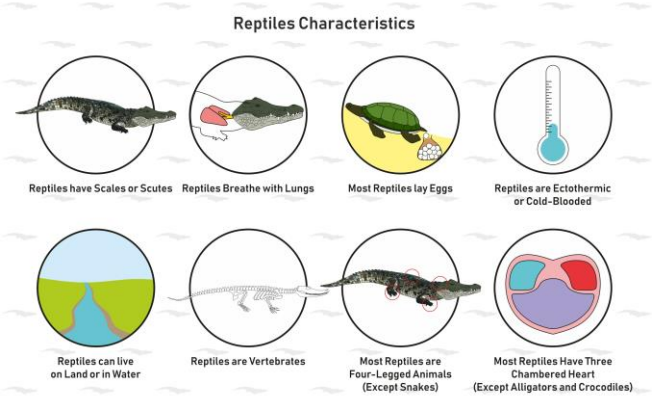
Animal Diversity - Vertebrates

Section 2: Reptiles & Birds



Reptiles are categorized into three main groups – **lizards and snakes**, **alligators and crocodiles**, and **turtles**. **Reptiles** live all over the world except in frigid locations. As ectothermic or cold-blooded creatures, they rely on external heat sources to regulate body temperature, thriving in warm climates where they utilize energy from the sun to keep warm.

Reptiles employ **internal fertilization** and lay their eggs on land. Internal fertilization is the joining of an egg and sperm cell during sexual reproduction, which occurs inside a female's body. While still inside the mother's body, fertilized eggs are covered with membranes and a leathery shell. This shell, an amniotic egg, helps protect the developing embryo and keeps it from drying out. Almost all reptiles do not care for their young, abandoning their eggs and leaving the baby reptiles to grow up independently. Crocodiles are the exception.

Lizards, a diverse group of reptiles, exhibit a wide range or adaptations. Lizards have skin covered with overlapping scales that prevent them from drying out. They don't shed their skin whole like snakes do, but rather over time, they lose patches of it as they grow. Additionally, they have a unique adaptation for survival that allows them to regenerate their tail if it's lost when evading predators. When threatened, the tail detaches from the body and continues to move, distracting the predator and allowing for a speedy getaway.

Snakes, like lizards, also have dry, scaly skin covered with overlapping scales. They push themselves on their bellies by moving forward or sideways. They have flexible muscles in their jaws that allow them to stretch like a rubber band. This allows the jaw to get wider as it eats. Additionally, snakes use their bellies to move and can molt or shed their skin several times. The molting process allows the snake to grow. They also have **kidneys**, an organ that filters water from the blood and excretes it as urine.

Unlike lizards and snakes, a **turtle's** body is covered by a protective shell that develops from its ribs. They retreat into the shell when threatened or when they sleep. Turtles live in or near water and can hold their breath underwater for a very long time. Their diet includes plants and fish, and like other reptiles, they lay eggs with leathery shells. During nesting season, they migrate from feeding areas to sandy beaches, where they dig a hole and lay their eggs. Then, they cover them and return to the ocean.

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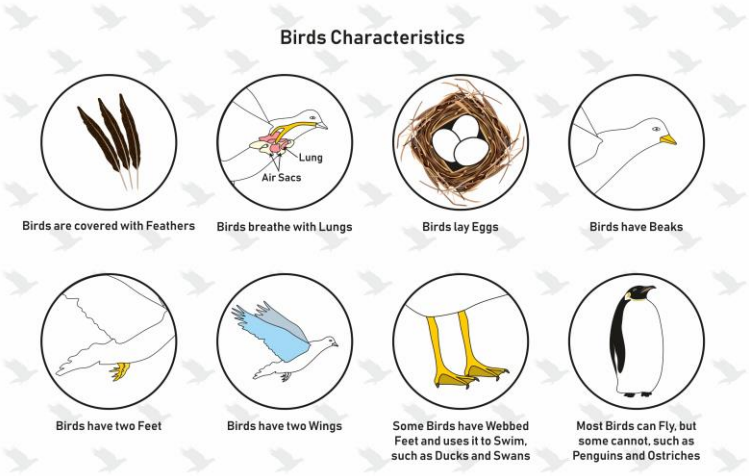
Crocodiles and **alligators** possess distinct and fascinating adaptations that have enabled their survival for millions of years. While they spend most of their lives in water, they exhibit the versatility to inhabit land as well. They have four legs and a muscular tail for swimming. Their powerful jaws, large scales, and eyes and nostrils positioned on top of their heads distinguish them as formidable predators. The primary difference between a crocodile and an alligator is the differences in their snouts. The crocodile has a long, V-shaped nose, and an alligator has a wide, rounded, u-shaped snout.

Birds, unlike reptiles, are endothermic vertebrates living in diverse environments worldwide. The shapes of their **feet**, **legs**, and **beaks** allow them to thrive and survive in these different places. For instance, the webbed feet of a duck are designed for efficient swimming, while the long, powerful legs of an ostrich facilitate rapid movement, covering impressive distances in a single stride. Gulls, with their sharp bills, can snatch their prey, toss it in the air, and then swallow it whole. Furthermore, a bird's beak, made of keratin, is sturdy, resilient, and well suited for tasks such as pecking holes and feeding.



A bird spends much of its life in the air, which requires a tremendous amount of energy. Birds are equipped with a highly efficient respiratory system featuring a pair of lungs that move oxygen quickly through their bodies. Their four-chambered heart, characterized by its size and systematic function, gives them the stamina they need for sustained flight. To support their energetic lifestyle, they have a high-energy diet consisting of insects, seeds, and sometimes other small animals. A bird's **wings** have a defined shape and ample surface area that are required for flight. Their bones are hollow, making them light and capable to support their wings. Furthermore, the muscles on their breastbone provide the necessary power and endurance for both shorter and longer flights.

Bird's feathers are multifunctional and play a vital role in flight and insulation. The feathers found on a bird's wings, and tail are referred to as flight feathers. Their **contour feathers** give them a streamlined shape, creating an aerodynamic force that enables flight. A bird can change the shape of its wing to slow down or speed up. **Down feathers** provide insulation and help maintain body temperature.

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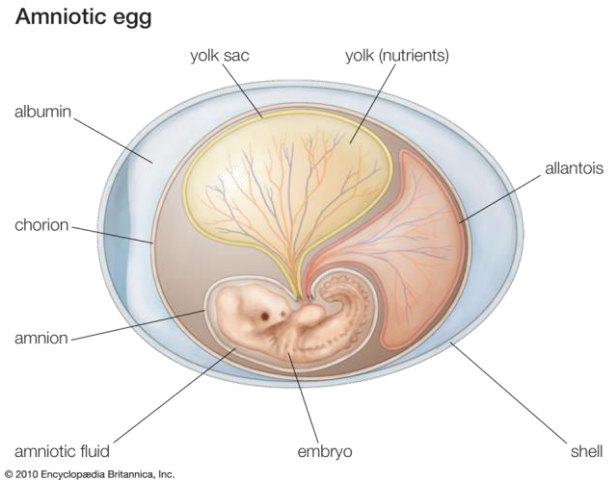

The amniotic egg, a defining feature of reptiles and birds, comprises distinct components that are crucial for protecting and nourishing a developing embryo. The amnion is a fluid-filled sac that surrounds and cushions the embryo, producing a protected, watery environment. Additionally, the albumen, or egg white, serves as protection against mechanical damage and provides a reservoir of water and protein. The chorion surrounds all the embryonic structures and regulates the transport of oxygen from the surface of the egg to the embryo and protective outer membrane. The shell provides protection, while allowing for gas and water exchange. The yolk is rich in lipids, which serve as an energy supply. Finally, the allantois stores wastes produced by the embryo. It later fuses with the chorion and serves as a respiratory organ.

Review:

1. Identify three characteristics of reptiles
2. What is the function of the kidney?
3. What adaptations to birds have that allow them to live in such diverse areas?