

REPTILE FACT SHEET

This educational resource was created by the New Jersey Academy for Aquatic Sciences, Adventure Aquarium's education partner. The fact sheet may be used by teachers and students to glean more information about reptiles in preparation for a field or to learn more about the reptiles you encountered at Adventure Aquarium.

What are Reptiles?

Reptiles developed from early amphibians and first arrived on the scene 345 million years ago. They became the dominant life form during the Mesozoic period, 225 million years ago. The 6000 species of reptiles alive today are represented by turtles, alligators and crocodiles, snakes, lizards, worm-like amphisbaenians (worm lizards) and the lizard-like tuatara.

What is the difference between a reptile and an amphibian?

While amphibians are tied closely to warm aquatic habitats, reptiles have developed several different adaptations that allow them to exploit different areas of the world. Unlike amphibians, reptiles are covered with epidermal scales, which allow them to retain body moisture. Arid deserts and salty oceans would quickly kill most amphibians by causing them to lose body moisture through scale less skin; however, scaled reptiles easily adapted to these environments.

Since epidermal scales prevent reptiles from being able to respire through their skin, they just rely solely on their lungs to breathe. This inability to breathe through their skin or gills prevents reptiles from having an aquatic larval stage. Consequently, reptiles turned to internal fertilization. Most early vertebrates rely solely on external fertilization to continue the chain of life. However, external fertilization only works in an aquatic environment. Instead, reptiles and all other future vertebrates utilize internal

fertilization. Internal fertilization is the process whereby eggs are inseminated while inside the female's body.

This led to another major adaptation for reptiles: the development of a shelled egg. Reptiles' eggs have a leathery shell that allows oxygen to pass through while retaining all of the egg's moisture. This new advancement allows reptiles to lay their eggs far away from water, enabling them to colonize arid areas that are inaccessible to water-dependant amphibians. Some modern reptiles have eliminated the need for eggs altogether, and give birth to live young.

Why do I only see snakes and turtles when the weather is warm?

Although reptiles have made important evolutionary advancements, they retain their cold-blooded heritage. For this reason, reptiles are limited to warmer climates. It is not uncommon for many reptiles to "bask" in the sun in order to elevate their body temperature. As their body temperature rises, reptiles have more energy and become more active. It has always been assumed that dinosaurs were members of the reptile class because they laid reptilian eggs and appeared to be covered with epidermal scales. However, recent theories suggest that large, active dinosaurs would have had to have a large, four-chambered heart to produce enough blood pressure to provide adequate circulation throughout the dinosaur's body. The presence of a four-chambered heart, rather than a reptile's typical three-chambered heart, would imply that dinosaurs may have been warm-blooded. This trait would separate dinosaurs from the reptile class. Scientists are still actively debating how we should classify dinosaurs.

What are Turtles?

Turtles are the most easily identified of all the living reptile groups because of their distinctive

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shell. Flattened ribs, the spinal column, pelvic and shoulder bones are all fused together to form the shell. Unlike turtles depicted on Saturday morning cartoons, real turtles cannot come out of their shells. The top portion of the shell is called the carapace, and the bottom portion is called the plastron. The shell provides the turtle with a protective covering that keeps the turtle safe from all but the most tenacious predator. The shell of water turtles also provides a streamlined body, helping them to move a bit faster when swimming. However, just as in cartoons and storybooks, most species of turtles move relatively slowly on land and not much faster in the water.

From what is a turtle's shell made?

The skeleton of a turtle is different from most other vertebrates in two ways. The first and most obvious difference is the formation of the shell. As described earlier, a turtle's shell is made up of bones that have been fused together to form a complete structure. The top and bottom portions of the shell are connected at the sides by hard shelled plates called lateral bridges. This leaves openings in the front and the rear of the shell for the turtle's head, legs, and tail to poke out. With the exception of box turtles and a few others, turtles cannot open and close their shells in order to seal themselves in. Box turtles (*Terrapene sp.*) have a hinged plastron which allows the turtle to seal its body inside the shell by closing the plastron against the carapace. Most other species of turtles can retract their head and legs inside into the shell to some degree, but can't seal them off. Turtles have a relatively long neck that folds upon itself to allow the head to retreat into the shell. Sea turtles cannot retract their head, legs or tail into their shell.

The second major difference between turtles and most other vertebrates is the absence of teeth. Instead, turtles have a hard beak similar to birds. The beak is strong and often sharp,

quite capable of crushing insects, plants, fish or crabs.

The body of most turtles, including the shell, is covered by scales. The shell is divided into individual sections called scutes, and each scute is covered with a single scale. These scales are shed as the turtle grows. A few species of turtles, such as soft shell turtles and the leatherback sea turtle, do not have a hard, scale-covered shell, but rather a smooth, skin-covered shell.

Are sea turtles really turtles?

Sea turtles are large turtles that have adaptations that allow them to thrive in the world's oceans. In fact, with the exception of females that crawl onto sandy beaches to lay eggs and hatchlings that crawl from the beaches to the sea, sea turtles never come up onto land.

There are seven species of sea turtles alive today. They include the leatherback, loggerhead, hawksbill, Kemp's ridley, olive ridley, flatback, green and black sea turtles. All are quite large and have flat, paddle-like flippers and a streamlined shell. They are found around the world in tropical and temperate seas. Some species, such as the flatback sea turtle of Australia, are found in only one geographical region, while others, such as the leatherback, are found throughout the world.

What do sea turtles eat?

Sea turtles are opportunistic feeders that dine on a variety of crabs, lobsters, bottom fish, and anything else that they can catch. The green sea turtle is largely a vegetarian, eating primarily sea grasses and mangrove shoots. Jellyfish make up the majority of the diet of leatherbacks and are often eaten by other turtles as well. Sea turtles consume a lot of saltwater as they eat. Excess salt is secreted from salt glands located near the eyes. The salty liquid secreted contains twice as much salt as sea water. Female sea turtles often appear to cry while they

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are laying their eggs; however, the tears are actually secretions from the salt gland.

Are sea turtles good swimmers?

Sea turtles are accomplished swimmers; some of them migrate thousands of miles over the course of their lives. Adults can swim at speeds near 35 mph, yet they are most comfortable casually cruising from one place to another.

Sea turtles spend much of their time underwater. They do not dive particularly deep, but they can stay underwater for a long time. During normal activity, a sea turtle will return to the surface every few minutes to get a breath of air; however adults sleeping underwater can stay submerged for 2 hours. When sleeping underwater, sea turtles frequently wedge themselves under some submerged object to keep from floating away.

Sea turtles have adaptations that allow them to hold their breath for extended periods of time. They are capable of tolerating higher concentrations of carbon dioxide in their blood than most other air-breathing animals. This allows them to use oxygen very efficiently. In addition, both the blood and muscles are able to store oxygen in large quantities.

How are baby sea turtles born?

Sea turtles mate while at sea and only the female crawls up onto specific sandy beaches to lay her eggs. Using her rear flippers, the female digs a nest into the sand above the high-tide line. She then deposits Ping-Pong-ball-shaped eggs, sometimes numbering in the hundreds. She covers the nest with sand and then returns to the sea, never to see her offspring again. After 4 to 8 weeks, the eggs hatch, and the baby sea turtles dig their way out of the sand and head toward the water. Baby sea turtles are only about 2 inches in length and they have to evade numerous predators as they leave the beach.

Baby sea turtles make their way to the open ocean where they slowly grow over the next decade. As sub-adults, sea turtles migrate to shallow coastal waters where they continue to mature. Eventually, adult sea turtles begin to mate and the females will travel to the beach where they were born to start the cycle over again.

Are sea turtles in trouble?

All species of sea turtles are listed as endangered or threatened and are protected by the Endangered Species Act. Many factors have influenced their decline in numbers. Beachfront development has reduced historical nesting areas. City lights inhibit female turtles from coming onto the beach and can confuse the turtles as to the direction of their nesting beaches. Pollution also impacts the turtles' decline in population. Many sea turtles die from choking on plastic trash that is mistaken for jellyfish. Sea turtles are also hit by boats and killed in fishing nets. Some are also illegally hunted.

On the positive side, there are many rehab institutions that take injured or stranded sea turtles and nurse them back to health. Protected beaches encourage sea turtles to nest. Permitted organizations transplant sea turtle eggs from nests on dangerous beaches to safer areas, and some nests are protected with fences to keep predators away.

What are alligators and crocodiles?

Alligators and crocodiles are another ancient group of reptiles that shared the earth with dinosaurs, millions of years ago. They are large, powerful predators that have changed very little from ancient times. Twenty-three species of alligators, crocodiles, caimans, and the gavia are alive today. Collectively, they are known as crocodylians. Crocodylians are large, heavy-bodied reptiles with long, toothy snouts and long, muscular tails. They are primarily found in tropical freshwater and brackish habitats,

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although a few species occasionally venture into saltwater areas.

The United States is home to two native species, the American alligator (*Aligator mississippiensis*) and the American crocodile (*Crocodylus acutus*). The American alligator is found throughout the coastal southeastern states from South Carolina to Texas, reaching lengths up to 16 feet. This species is most frequently found in the slow-moving freshwater habitats of marshes, bayous, lakes, and swamps. Once threatened with extinction, the American alligator has made a strong comeback and is now considered common through most of its range. On the other hand, the American crocodile is listed as an endangered species over most of its range, especially in the United States. The American crocodile is one of the larger species of crocodile, reaching lengths of nearly 20 feet. In the United States, they are limited to the southern tip of south Florida in the Everglades' Florida Bay, Biscayne Bay and the Florida Keys. The American crocodile is much more tolerant of saltwater and is commonly found in brackish environments. Central and South America's spectacled caiman (*Caiman crocodilus*) has become popular in the pet trade, and many have been introduced into areas of southern Florida where they have formed breeding populations. The spectacled caiman reaches sizes of up to 8 or 9 feet.

What is the difference between an alligator and a crocodile?

Crocodiles and alligators look very similar, and many people have difficulty distinguishing differences between the two. Most of the obvious differences between the two groups are associated with the animals' heads. Alligators and caimans have a wide "U" shaped snout while crocodiles have a more narrow "V" shaped snout. Additionally, an alligator's upper jaw is wider than its lower jaw. When the alligator's mouth is shut, the teeth of the lower jaw are hidden from view by the larger, overlapping upper jaw. Crocodiles, on the other hand, have

equally-sized jaws, so the teeth in the lower jaw are exposed when the animal's mouth is closed. Crocodiles also have a salt gland on their tongue which allows them to excrete excess salt from the body. This gland allows crocodiles to inhabit saltwater environments.

How do alligators move?

Although crocodilians are well adapted to life in the water, many species will travel great distances on land to find new bodies of water to inhabit. They have four short legs with webbed feet, and although they move rather slowly on land, they can sprint for short distances. An average person can outrun a crocodile on land. However, a crocodile in the water is quite another story. A long flattened tail allows crocodilians to move quickly and quietly, and they may swim in short bursts of over 15 mph.

Despite their ability to swim quickly, crocodilians do not typically chase down their prey in or out of the water. Instead, they are ambush predators, quietly waiting just below the surface of the water for an unsuspecting animal to approach.

Crocodilians have nostrils and eyes located at the very top of their skulls. This adaptation allows them to stay almost completely underwater, while still being able to breathe and see above the water. When it is time to submerge, a protective flap covers the nostrils to keep water out, and a protective membrane covers the eyes to improve underwater vision. Crocodiles and alligators normally stay submerged for 15 to 30 minutes at a time, but can remain underwater for 2 hours or more.

How are baby alligators and crocodiles born?

Pregnant female crocodilians build nests of vegetation and mud on banks along quiet waterways. The female lays her eggs within the nest and covers them with rotting plants. The nests are usually located above the flood plain of the waterway and can be as high as 3 or 4

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feet when finished. The number of eggs and their size, along with the normal incubation period, varies greatly among species.

Once a female lays her eggs, she remains nearby to protect the nest from predators. If danger threatens, she will rapidly return to aggressively defend the nest. Once the eggs hatch, the juveniles call to their mother by making "chirping" sounds. She often opens the nest and carries the babies to the water. The juveniles of some species form pods (which may include individuals from other nests) and remain close to the mother for a variable period of time. This affords protection in numbers, and a swift response from the guardian female if they begin calling in response to impending danger. This behavior is exceptional, in that parental care of any kind is very rare in reptiles.

Are alligators and crocodiles really dangerous?

Much like sharks, alligators and crocodiles have a reputation for being dangerous man-eaters. Like sharks, their reputation has been greatly exaggerated. Any large predator can be considered a threat when living in close proximity to people; however, very few animals

attack people unprovoked, in order to consume them.

As of 2005, only 18 people had been killed in the United States by alligators since 1948. Similarly, only 1 person on average is killed by a crocodile in Australia each year. Certainly, crocodilians have been responsible for a number of attacks on people over the years. However, they are not nearly as common or as lethal as car accidents or drowning. The attacks that do occur often involve small children, family pets, or situations in which the animal feels threatened.

What Turtles will I see during my visit to Adventure Aquarium?

You will see the following turtles: Green Sea turtle, Loggerhead Sea Turtle, and Northern Diamondback terrapin. You will also see the following crocodilian: Smooth fronted caiman. We make every effort to keep the species list updated, but please check the website for current species on exhibit.

For detailed information on each of these species, visit www.AdventureAquarium.com.

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