Reptile or Amphibian? Do You Know the Differences?

By: Eric Roscoe

**Reptile Vs. Amphibian Graphic. © Laura Klappenbach.*

Reptiles and amphibians, which are oftentimes collectively known as “herptiles”, or “herps” for short, are among the most unique, adaptable, and diverse groups of animals, having many different lifestyles and characteristics not seen in any other group of animals. They make up approximately 17,000 known and described species, worldwide, from our seas and oceans, to tropical rainforests, arid to semi-arid deserts, grasslands, and savannahs, to even our own local parks and backyards! And that only includes all of the species we currently know about, as there are many which have yet to be described, or become newly discovered every year!

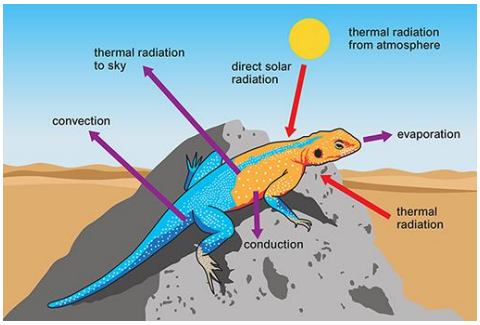
But, still to this day, one common area of confusion is just what are the differences between reptiles and amphibians? Are there also similarities? What about many groups of commonly confused species, such as crocodiles and alligators, frogs and toads, or turtles and tortoises? Are these both reptiles, or both amphibians respectively? Or are one of these a reptile and the other an amphibian? As it turns out, they are indeed both reptiles or both amphibians, depending on which group is being discussed. But what about if one did not already know the differences? What traits or characteristics can someone use in general to help distinguish and determine whether an animal they encounter is a reptile or an amphibian?

In this article, we will shed light on the understanding of what makes reptiles and amphibians both similar to one another, and different as well! Reptiles and amphibians can oftentimes be seen or observed within the same habitats or micro-environments and at the same, or similar times, and to begin, here are some common similarities between the two!

Similarities:

-Both reptiles and amphibians are Ecothermic, or more commonly and informally known as

being “cold-blooded”. This means that they generally cannot create or regulate their own internal body temperatures the same way that humans or other mammals can, and instead, fluctuates with their surrounding environments.
-When it comes to reptiles, these fluctuations are overcome or created through daily activities such as basking; in that these animals will bask on warm or sunny surfaces to help warm up their internal body temperatures, and likewise, will seek shelter in the shade, under rocks or logs, or in burrows to cool off. This behavior more precisely classifies most reptiles as being Poikilothermic. Most amphibians, on the other hand, more seldom bask in the same manner, as doing so may dry them out or cause desiccation.



**Reptile Basking Diagram. © Open.edu*

-Both reptiles and amphibians are also Vertebrates, meaning they all have a central spinal column, backbone, and an internal skeletal structure with bones. This differentiates them from other groups of animals such as insects and arachnids, which would be called Invertebrates.

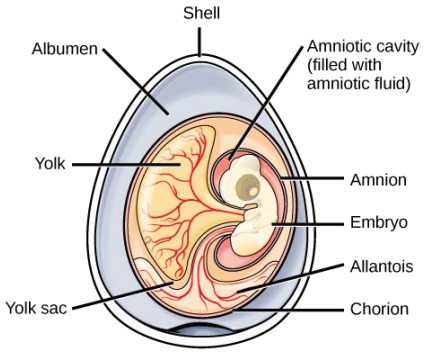
-Most reptiles and amphibians both have lungs, which can be modified in size or function in some groups (such as snakes). Many of both reptiles and amphibians can also breathe, or respire through their skin, ventral or cloacal openings, or through other methods of gas exchange, although this will also be discussed as a major difference in general. The cloacal chambers of both also consist of the same openings used for urinary, intestinal, and reproductive tracts to exist their bodies.

-Lastly, with the exception of crocodilians (such as crocodiles, alligators, and caiman), which have four chambered hearts, all other reptiles and amphibians share in common a three chambered heart, with different chambers or portions of their hearts performing different functions in blood flow.

Differences:

-Two of the largest differences between reptiles and amphibians are their methods of reproduction and eggs. Many reptiles lay hard and leathery shelled eggs on land, which is known as being Oviparous (with the eggs being developed internally). Other reptiles produce

“live” young which are also given birth to on land, which is known as being Ovoviparous, or in fewer cases, “truly” Viviparous.



**Amniotic Egg of a Reptile. © Lumen Learning.*

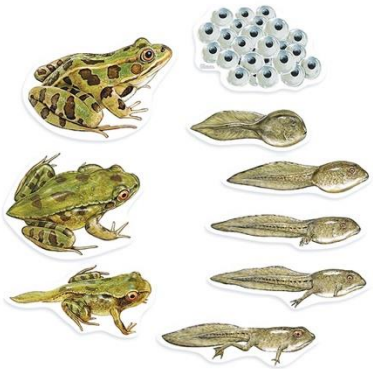
-By contrast, most amphibians lay or deposit their eggs in bodies of water, or in moist areas. An amphibian’s egg is clear and transparent, lacks the hard or leathery outer surface that a reptile’s egg does, and instead have a soft, gelatinous outer coating. Some amphibians also give birth to “live” young, but likewise must do so in the water.

**Comparison of Amniotic Egg and an Amphibian Egg. © Amphibians-Creatures of Interest.*

-The number of reproductive life stages also is a differing factor between reptiles and amphibians. Most reptiles have only a single life form, for the most part resembling miniature versions of their adult counterparts in overall shape or form upon being given birth to, or hatching from their eggs. However, many can have differing colors or patterns between adults and juveniles, which is known as Ontogenetic Coloration.
-Most amphibians, on the other hand, have at least three or more life stages, which can be more complex, and also often revolve around living in, or near water. Upon hatching from their egg, many amphibians have an initial larval stage with characteristics for living under-water, such as having external gills, smooth skin, and finned tails or limbs for swimming and movement through the water. These are what we commonly know as tadpoles in frogs and toads, or larvae in many salamanders. Amphibians can have many different breeding and reproductive strategies for laying or depositing their eggs, depending on the habitat and area of the world in which they are found.

**Hatchling Reptiles Hatching from their Eggs, Resembling their Adult Forms. © Incubator Warehouse.*

-After a couple of weeks, or even months depending on the species, these tadpole or larval forms of amphibians will begin to develop legs, while beginning to absorb their external gills and tails, and shortly thereafter, becoming their final adult form of a frog, toad, newt, or salamander. Newts can furthermore, have a more varied and complex life cycle, which may alter between terrestrial and aquatic life stages, which is a significant factor between newts and salamanders.



**Lifecycle of an Amphibian, such as a Frog or Toad. © Acorn Naturalists.*

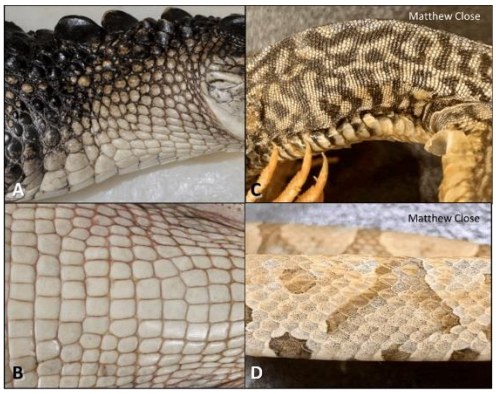
-Another noticeable difference between reptiles and amphibians are their skin and scales, or lack thereof. All reptiles generally have one or more layers of skin, covered by thick, hardened Scales. These scales are comprised of Keratin, which happens to be the same material as human hair and fingernails are made of. A reptile's scales can serve for many different functions or purposes, including providing physical protection from predators or other damage, provide for the absorption of sunlight for metabolic growth, conserve water and to prevent water loss, and to aid in their overall movement and locomotion.

-All amphibians, on the other hand, have either smooth and moist skin, or rough and dry skin, with the common similarity being that they lack the external scales which reptiles have. Amphibians generally rely much more heavily on their skin, in addition to their lungs, for passive breathing and respiration, which is why many secrete or create waxy or mucous-like substances to help keep their bodies hydrated and moist, as well as to maintain oxygen

transfers to and among their blood cells. This lack of outer protection in the form of scales are a major reason why amphibians can be much more sensitive and susceptible to physical handling and negative environmental changes than most reptiles.

**Smooth and Scaleless Skin of an Amphibian, in this case, a Tiger Salamander. Despite their lizard-like appearances, the lack of scales is one major difference which makes all salamanders and newts amphibians, and not reptiles. © Dickenson County Conservation Board.*

In summary, reptiles and amphibians can both have many similarities in common, as well as many differences which define and classify them. While many reptiles and amphibians can share and be found in the same habitats and places in time, they also possess many very different niches, or ecological roles from one another. While there are certainly other, minor differences between reptiles and amphibians not mentioned here, it is generally the differences in their reproduction, life-stages, and presence or absence of scales and differences in their outer cutaneous layers that are three of the most significant differences between these two groups of amazing animals!



**The Hardened Scales or Scutes on Different Reptile Species. © Matthew Close.*

-In another short and quick summary, amphibians include all salamanders and newts, all frogs and toads, and another unusual and lesser known group of amphibians known as the caecilians, resembling limbless, or nearly limbless snakes, or large earthworms, living primarily in tropical to sub-tropical areas, with most being fossorial or living underground.

-Reptiles, at least those non-avian, include all turtles and tortoises, all crocodilians (including

alligators, crocodiles, caiman, and gavials, all lizards, snakes, and tuatara, a unique group of lizard-like reptiles in appearances indigenous only to New Zealand, but having differing evolutionary, skeletal, and morphological differences from lizards.