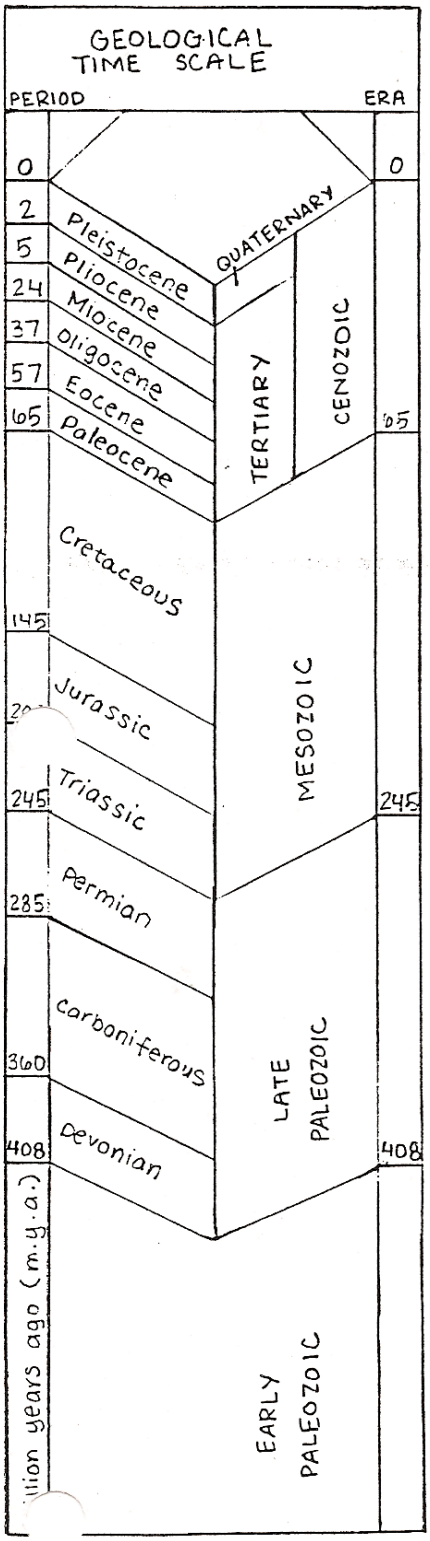
REPTILES



Modern reptiles inhabit every continent with the exception of Antarctica. The Class Reptilia is composed of four Orders:

- Chelonii or Testudines – turtles and tortoises
- Crocodilia – crocodiles, alligators, caimans and gharials
- Sphenodontia – tuataras
- Squamata – lizards and snakes

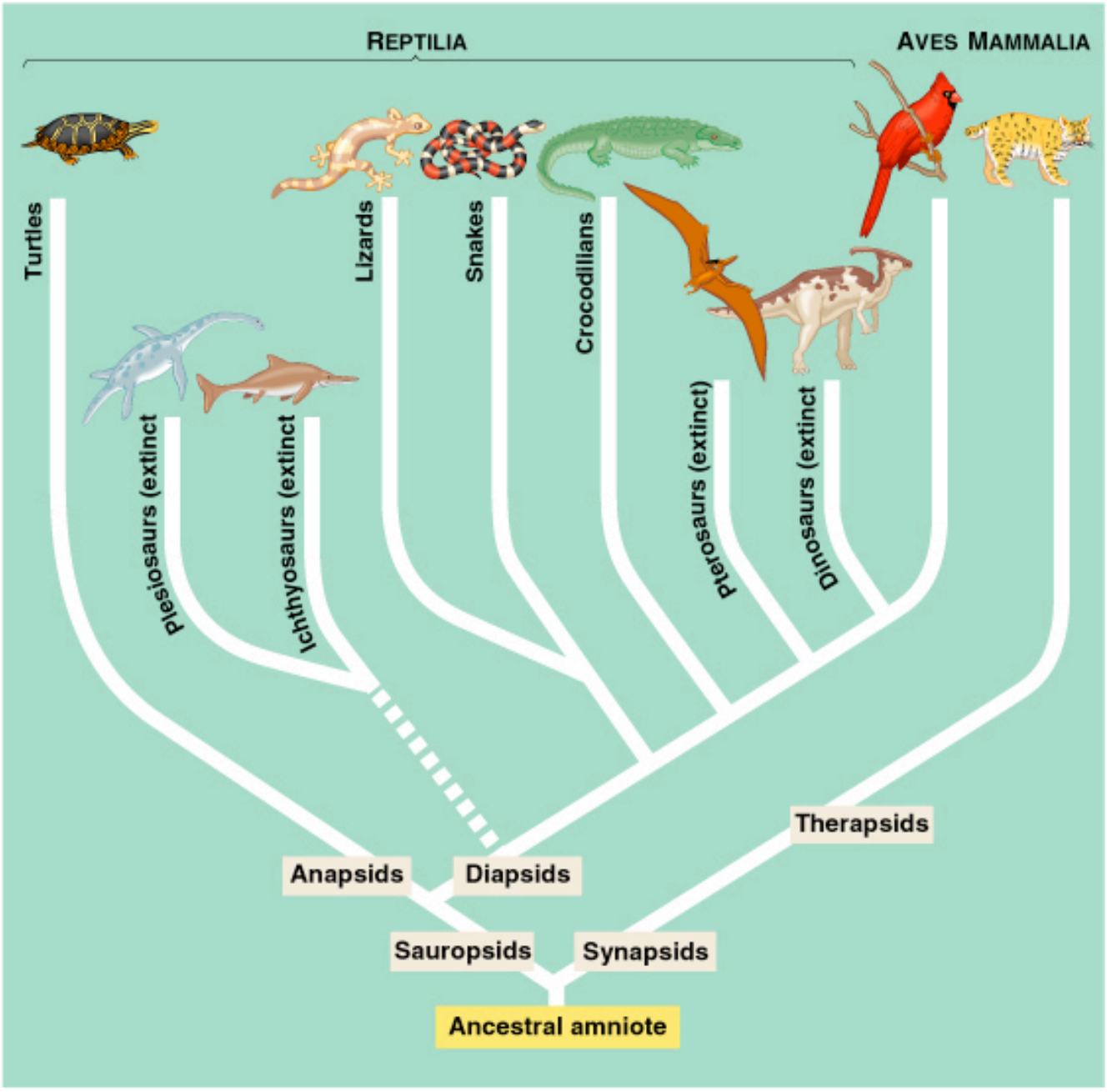
Reptiles have distinct characteristics that distinguish them from other vertebrates:

- Reptiles are **poikilothermic** or **ectothermic** (having a body temperature that varies with the temperature of its surroundings), like fish and amphibians. They are able to adjust body temperature through behavioral adaptations.
- Reptiles have water-tight skin. Reptiles have scales or scutes that protect them from the outside world.
- Reptiles were the first animals to develop amniotic eggs. These eggs carry their own water supply and have a semi-permeable membrane that allows exchange of gases. They allowed for rapid development of embryos in a terrestrial environment.

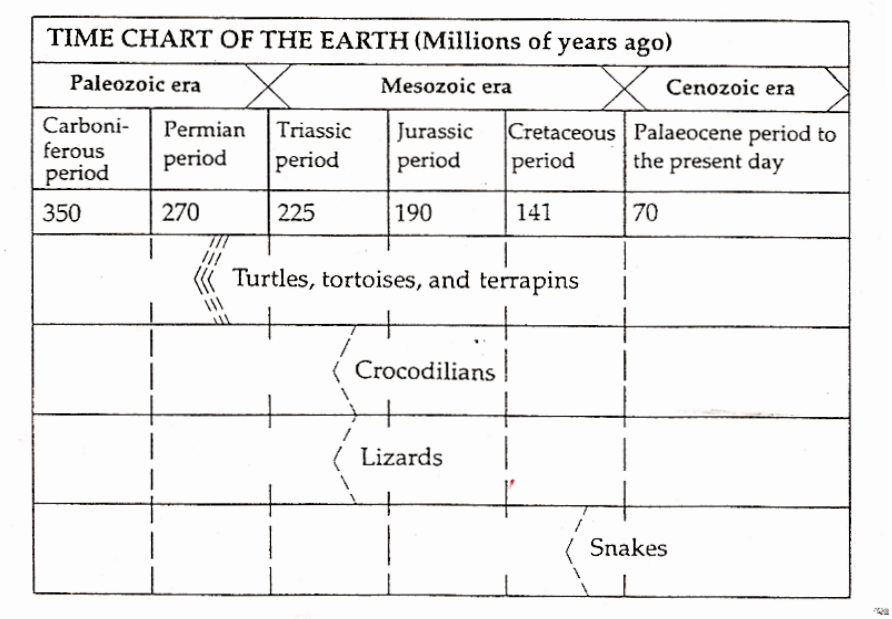
The first reptiles appeared about 340 million years ago during the Carboniferous period. They evolved from terrestrial-insectivorous amphibians, and although not much is known about their early history, it seems likely that these first reptiles looked like some of our modern lizards. The amniotic egg allowed for the evolution of reptiles and permitted adaptive radiation of land vertebrates away from watery environments. The amniotic egg enabled an animal to reproduce on dry land by containing its own water environment within the egg itself.

The true "Age of Reptiles, " in which the dinosaurs ruled the earth, lasted from the Permian (285-245 million years ago) until the Mesozoic (245-65 million years ago). It was not until the later Mesozoic era, that flying reptiles appeared. During this period other reptiles gave up living on land and returned to dominate the seas and lakes. Dinosaurs ruled the land. At the end of the Cretaceous (65 million years ago) the dinosaurs became extinct due to unknown causes. The remaining forms evolved into modem reptiles, birds and mammals.

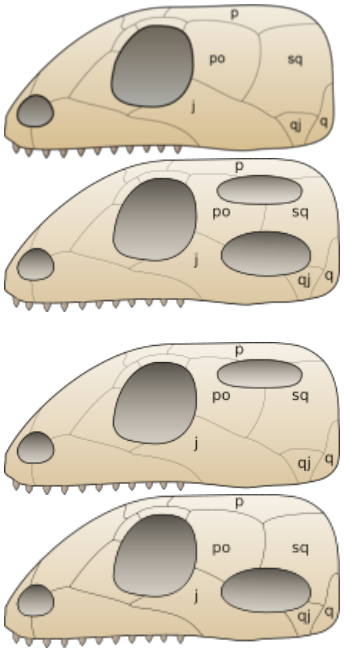
The word "reptile" comes from Latin, meaning to crawl. They usually have 5 digits on each of the four feet. Their head is usually carried off the ground on a well-developed neck. Ribs are found on most vertebrae to protect their internal organs.



The phylogeny of the three classes of amniotes: reptiles, birds and mammals (above)



Early diversification of amniotes produced three patterns of holes in the temporal region of the skull. These openings provided space for the large muscles needed for feeding when shifting from an aquatic environment to a terrestrial one. Modern reptiles are split into four subclasses based on the number and position of temporal fenestrae, openings in the sides of the skull behind the eyes.



- Anapsid - lack temporal fenestrae
  - Order *Testudines or Chelonii* (Turtles, tortoises and terrapins)

Note: The anapsid skull of modern turtles may have evolved secondarily

- Diapsid - two temporal fenestrae
  - One dorsal and one ventral
  - Major reptiles (birds are diapsid as well)
  - Order *Squamata* (lizards and snakes)
  - Order *Sphenodon* (tuatara)
  - Order *Crocodillia*
- Euryapsid – single, high temporal fenestrae
  - no surviving descendants of the euryapsids
  - protosaurs, pleisiosaurs, and ichthysaurs

- Synapsid - single, low temporal fenestrae
  - Therapsids - mammal-like reptiles

All reptiles except crocodilians have a heart with a single ventricle (3-chambered heart). The 3-chambered heart can adjust the proportion of blood that goes to the body versus the lungs (intracardiac blood shunt). Reptiles use the ability to shift blood between the body and the lungs to accelerate heating and slow cooling.