

Paleontology Lab: Reptiles and Birds

Objectives:

- Be able to identify the major features of reptiles and the important differences between reptiles and amphibians.
- Be able to understand the phylogeny of the land vertebrates and the classification of amniote groups.

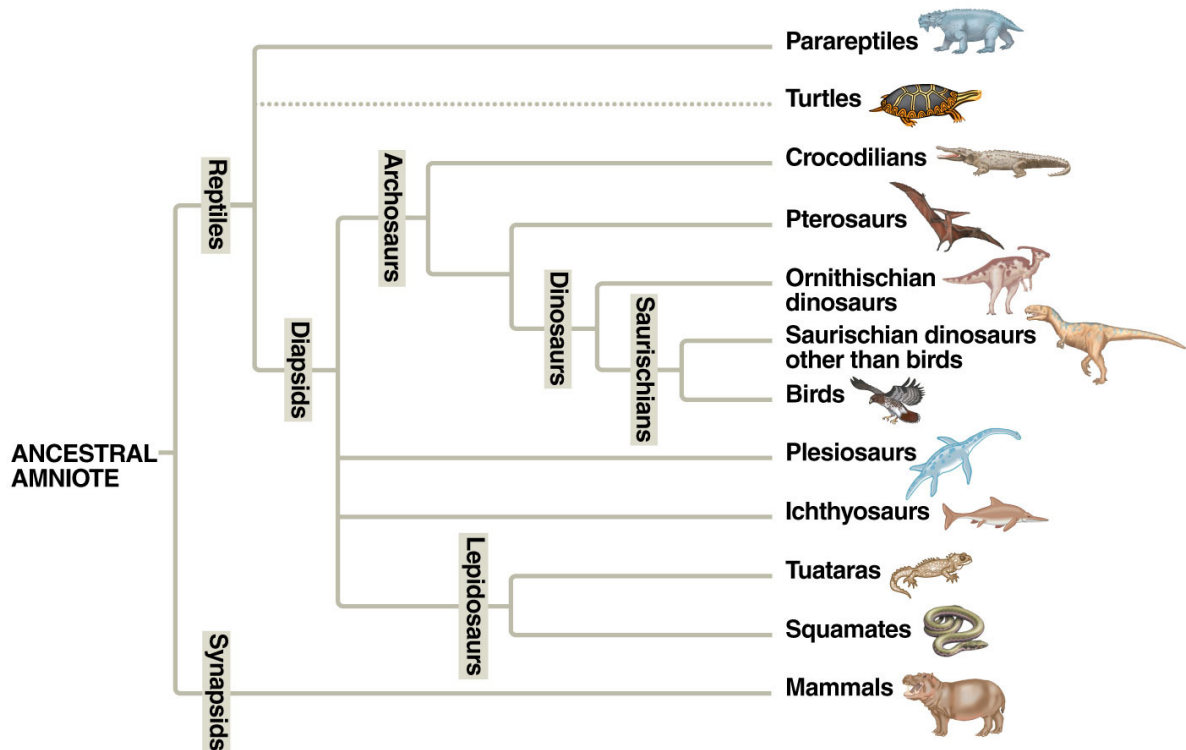
Materials needed for this lab:

Preserved specimens and skeletons of reptiles and birds; also dinosaur models.

Amniotes:

What adaptation do amphibians lack, that requires them to stay near a body of water? (Think of reproduction.) The **amniote egg**, capable of being laid on land, requires internal fertilization. Its evolution marks the transition from amphibians to reptiles. Reptiles and their descendents are called **amniotes**.

On the phylogenetic tree shown below, note that the dinosaurs are subdivided into **Ornithischians** and **Saurischians**, with birds (**Aves**) included in the Saurischia.



Class Reptilia (or Sauropsida):

Reptiles are amniotes that are in most cases covered in epidermal scales and cold-blooded (body temperature variable, usually closely following the temperature of the environment). Reptiles were once very diverse, especially during the Mesozoic Era, but only a few reptile groups survive today. Among the reptiles are these groups:

- **Testudines** (turtles and tortoises)
- **Plesiosauria** (extinct marine reptiles with paddle-like limbs)
- **Ichthyosauria** (extinct marine reptiles with fishlike body shapes)
- **Sphenodontia** (the tuatara of New Zealand, and its ancient relatives)
- **Squamata** (lizards and snakes, the largest living group)
- **Crocodylia** (alligators and crocodiles)
- **Pterosauria** (extinct flying reptiles)
- **Ornithischia** (dinosaurs with a "birdlike" hip)
- **Saurischia** (dinosaurs with a "lizardlike" hip, including the ancestors of birds)

Below is a family tree of **dinosaurs**, including the orders Ornithischia and Saurischia. We have many models on display in lab, and even more out in the hall. Notice that the group shown here is monophyletic and includes the birds. If the birds were excluded, the group would be paraphyletic. If we added various other large extinct reptiles (such as ichthyosaurs, plesiosaurs, and ancient crocodiles), such a group would be polyphyletic.



Birds:

Birds are warm-blooded vertebrates covered in feathers, and most of them fly. They were traditionally recognized as **Class Aves**, but, since they evolved from a group of saurischian dinosaurs, a growing number of zoologists now place them within the Class Reptilia. Examine several birds and notice their adaptations for flying.