



# Origins of Birds

Study*ladder*



# Birds and Dinosaurs?

*It's hard to imagine, but scientists believe that birds are most closely related to a type of dinosaur! Does that mean that birds are reptiles? No, but they do have some features that they share with reptiles. They both lay eggs and they both have scales on at least some parts of their bodies. But the features that make them different include having a feathered body and a beak with no teeth.*



*Some of the earliest ancestors of birds were a type of dinosaur that walked on two feet. These lived in the Jurassic Period, about 150 million years ago. Scientists believe that they were flightless, as are some birds today. The development of physical features such as flight feathers and hollow bones led to the ability to fly. It is thought that there were many different species of early birds by the Cretaceous Period.*

# Birds and Reptiles: Similarities

*Birds lay eggs, so do reptiles.*



*Reptiles have scales, so do birds.*



## Dinosaur Ancestors: Reptiles or Birds?

Scientific research suggests that birds are related to theropod dinosaurs. In 2007, paleontologists discovered quill knobs on the fossilized remains of a velociraptor. This indicated that the animal had feathers. However, they believe that it may have been a flightless dinosaur, as its wing span was too small to be able to support its larger body. The feathers may have been used to cover their nests while brooding, or to provide an extra boost of speed when running.

Fossilized velociraptor specimens have been found in Mongolia. They are thought to have lived in the Later Cretaceous Period about 75-71 million years ago.



Artist's impression of a feathered velociraptor.



A scientific reconstruction of the foot of a velociraptor



Feet of an ostrich, a current day flightless bird.

## ***Evidence of Bird-Like Behaviors: sleep position***

*'Mei Long' 140 million years old.*

*Fossils of 'Mei Long' were found in 2004, in Liaoning China. One specimen was found in a sleeping position with its head tucked under its forearm, just as modern birds do when sleeping. It may have been covered by volcanic ash while it slept or overcome with volcanic gases.*

*This picture shows a modern day duck sleeping with its head under its wing, just as Mei Long would have done.*



## ***Evidence of Bird-Like Behaviors: brooding***

*'Oviraptorosaurs' 125 million years ago.*

*There were many species of oviraptorosaurs. They had a shortened skull, like a parrot beak. Fossils of brooding oviraptorosaurs have been found with their arms shielding eggs in their nests.*

*This picture shows a modern day hen spreading its wings out over its chicks to protect them and keep them warm. How amazing that bird-like dinosaurs also did this millions of years ago!*



# The First Birds

*The fossilized remains of an 'archaeopteryx', one of the first specimens that linked dinosaurs with birds, was found in Germany in 1861. This fossil specimen clearly shows the presence of feathers on the wings, legs and tail. Archaeopteryx lived about 150 million years ago in the late Jurassic Period.*



## ***Microraptor***

*Lived in the Early Cretaceous Period  
(125-120 million years ago)*

*This is what some scientists think the  
microraptor looked like.*

- *It had feathers on its hind legs as well as its arms/wings.*
- *It had a long bony tail with feathers.*
- *It was about one meter long, including the tail, and weighed about 1 kg.*

*How far do you think it would have been able to fly?*



*Can you see evidence of feathers in this fossil?*







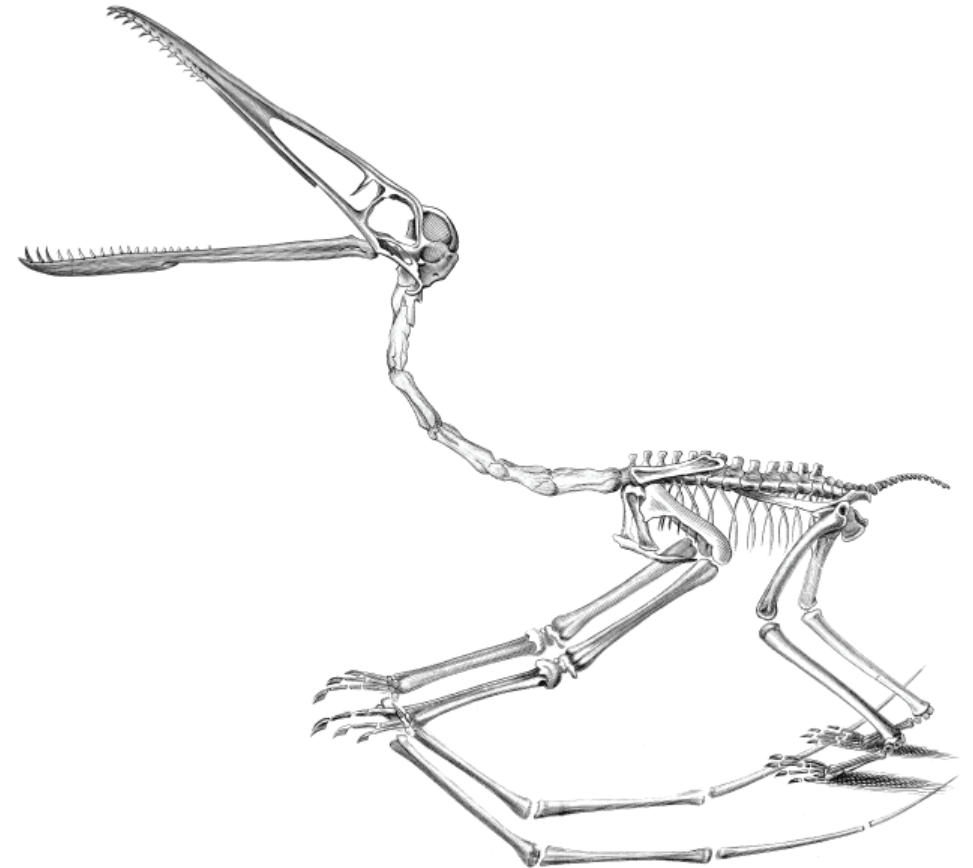
# Pterosaurs

*Many different species of Pterosaurs soared the skies during the late Jurassic Period. Although they were able to fly they were not birds.*

*Like modern day bats, they had strong membranes between their elongated fourth fingers and their hind feet, which enabled them to fly. They had long, thin skulls with many conical shaped teeth that helped them grab and hold on to small prey. They varied in size and some had bony crests on the top of their skulls.*



*Fossil of Pterodactylus Elegans that lived 148 million years ago.*



# Geological Timescale

