

What Are Dinosaurs?

The following are not dinosaurs*:

- Things that aren't organisms—There is no rock that is a dinosaur.
- Things that existed before the Triassic period†
- Pterosaurs

The following are dinosaurs:

- Birds (Aves)

The following contain dinosaurs:

- Archosaurs (X.Archosauria)
- Reptiles (Reptilia)

Dinosaur Overview

[A discussion of the important dinosaur clades.](#)

Dinosaurs are divided into two main groups: the eusaurischians‡ and ornithischians.

Eusaurischians

- Sauropods
 - Apatasaurus: diplodocoidean
 - Barosaurus: diplodocoidean
 - Brachiosaurus: macronarian
 - Diplodocus: diplodocoidean
- Theropods
 - Allosaurus: carnosaurian
 - Archaeopteryx: maniraptor
 - Gigantototaurus: carnosaurian
 - Megalosaurus: megalosaurid
 - Spinosaurus: megalosaurid
 - Tyrannosaurus: tyrannosauroid
 - Velociraptor: maniraptor

*See the Dinosaur Encyclopedia section for details on terms.

†See Appendix: Time for details on geological time.

‡These are commonly called saurischians, but since almost every interesting saurischian is actually in the subclade X.Eusaurischia, I've taken the liberty of breaking the standard. I hope you will grow to understand and accept my decision.

Ornithischians

- Eurypodans (thyreophor)
 - Ankylosaurus: ankylosaurian
 - Stegosaurus: stegosaurian
- Marginocephalians (cerapod)
 - Pachycephalosaurus: pachycephalosaurian
 - Triceratops: ceratopsian
- Ornithopods (cerapod)
 - Hadrosaurus: hadrosauriform
 - Iguanodon: hadrosauriform

Taxonomy

Describe notation and any changes I've made...

Dinosaur Encyclopedia

The following is alphabetized.

Allosauroidea (FSu)

ETYMOLOGY: “different-lizard-shaped” (Greek)

TAXONOMY: OS.Theropoda → X.Orionides → X.Avetheropoda → X.Carnosauria → **FSu.Allosauroidea**
 ⇒ F.Allosauridae, F.Carcharodontosauridae

EXTENT:

DESCRIPTION:

Allosaurus (G)

ETYMOLOGY: “different lizard” (Greek)

TAXONOMY: OS.Theropoda → FSu.Allosauroidea → X.Allosauria → F.Allosauridae → FS.Allosaurinae
 → **G.Allosaurus** ⇒ S.Fragilis

EXTENT: 155–150 Ma; North America, Portugal, Tanzania

DESCRIPTION:

Amniota (<CSu)

ETYMOLOGY:

TAXONOMY: P.Chordata → CSu.Tetrapoda → X.Reptiliomorpha → **X.Amniota** ⇒ X.Sauropsida,
 X.Synapsida

EXTENT: 312–0 Ma; every continent

DESCRIPTION:

Anatotitan

ETYMOLOGY:

See Edmontosaurus (G).

Anchisauria (<OS)

ETYMOLOGY: “near/close lizards”

TAXONOMY: O.Saurischia → OS.Sauropodomorpha → X.Massopoda → **X.Anchisauria** ⇒ OI.Sauropoda, F.Anchisauridae

EXTENT: 235–174 Ma (Late Triassic to Early Jurassic)

DESCRIPTION:

Anchisaurus (G)

ETYMOLOGY: “near/close lizard”

TAXONOMY: O.Saurischia → OS.Sauropodomorpha → X.Massopoda → X.Anchisauria → F.Anchisauridae → **G.Anchisaurus**

EXTENT: 200–188 Ma

DESCRIPTION:

Ankylosauria (OS)

ETYMOLOGY: “pointed lizard”

TAXONOMY: O.Ornithischia → X.Genosauria → X.Thyreophora → X.Euryopoda → **OS.Ankylosauria**

EXTENT: 201–66 Ma; every continent except Africa

DESCRIPTION: The first sort of dinosaur to be discovered in Antarctica.

Apatosaurus (G)

ETYMOLOGY: “deceptive lizard” due to the similarity of their chevron bones to those of F.Mosasauridae

TAXONOMY: OI.Sauropoda → F.Diplodocidae → FS.Apatosaurinae → **G.Apatosaurus**

EXTENT: 154–150 Ma; western United States

DESCRIPTION:

Archaeopteryx (G)

ETYMOLOGY: “ancient feather/wing” (Greek)

TAXONOMY: OS.Theropoda → X.Coelurosauria → X.Maniraptora → X.Avialae → F.Archaeopterygidae → X.Archaeopteryx ⇒ S.Lithographica

EXTENT: 151–149 Ma

DESCRIPTION:

Archosauria (X)*

ETYMOLOGY: “ruling lizards”

TAXONOMY: X.Sauropsida → X.Neodiapsida → X.Archosauromorpha → **X.Archosauriformes** → X.Crurotarsi → **X.Archosauria** ⇒ X.Avetatarsalia, X.Pseudosuchia

EXTENT: 250–0 Ma; every continent

DESCRIPTION: Archosaurs are basically the dinosaurs, pterosaurs, and crocodilians.

Archosauromorpha (X)

ETYMOLOGY: “ruling lizard-forms”

TAXONOMY: X.Reptiliomorpha → X.Amniota → X.Sauropsida → X.Neodiapsida → **X.Archosauromorpha** ⇒ X.Crurotarsi ⇒ X.Archosauria

EXTENT: 255–0 Ma; every continent

DESCRIPTION:

* Why is this considered a crown group?

Avemetatarsalia (X)

ETYMOLOGY: “bird-metatarsaled”

TAXONOMY: X.Archosauria → **X.Avemetatarsalia** ⇒ X.Dinosauromorpha, X.Pterosauromorpha

EXTENT: 245–0 Ma; every continent

DESCRIPTION: Avemetatarsals are basically the archosaurs that aren't crocodylians.*

Averostra (X)

ETYMOLOGY: “bird snouts” (Greek)

TAXONOMY: OS.Theropoda → X.Neotheropoda → **X.Averostra** ⇒ X.Ceratosauria, X.Tetanurae

EXTENT: 199–0 Ma

DESCRIPTION:

Aves

ETYMOLOGY: “birds” (Latin)

See Avialae (X).

Avetheropoda (<OS)

ETYMOLOGY: “bird theropods”

TAXONOMY: OS.Theropoda → X.Averostra → X.Tetanurae → X.Orionides → **X.Avetheropoda** ⇒

X.Coelurosauria, X.Carnosauria

EXTENT: 171–0 Ma

DESCRIPTION:

Avialae (X)

ETYMOLOGY: “birds”

TAXONOMY: OS.Theropoda → X.Avetheropoda → X.Coelurosauria → X.Maniraptora → X.Pennaraptora → X.Paraves → X.Eumaniraptora → **X.Avialae** ⇒

EXTENT: 160–0 Ma

DESCRIPTION: Classical birds.

Azhdarchidae (F)

ETYMOLOGY: “dragons” (Persian)

TAXONOMY: X.Archosauria → O.Pterosauria → X.Ornithocheiroidea → X.Azhdarchoidea →

X.Neoazhdarchia → **F.Azhdarchidae** ⇒ G.Quetzalcoatlus, G.Arambourgiania, G.Azhdarcho

EXTENT: 108–66 Ma; North America

DESCRIPTION: Azhdarchids have long necks with circularly cross-sectioned vertebrae. Their heads are large compared to their bodies, and their toothless beaks are long and sharp.

SPECIMENS:

Barosaurus (G)

ETYMOLOGY: “heavy lizard”

TAXONOMY: OI.Sauropoda → F.Diplodocidae → FS.Diplodocinae → **G.Barosaurus** ⇒ S.Lentus

EXTENT: 164–145 Ma; western North America, Africa

DESCRIPTION: Barosaurs are enormous, measuring up to 26 m. They're identified by 16 cervical and 9 dorsal vertebrae as opposed to diplodocuses and apatasauruses, which have 15 cervical and 10 dorsal vertebrae. No barosaurus skull has ever been discovered.

SPECIMENS: The AMNH has a barosaurus cast[†] in the Theodore Roosevelt Rotunda[‡]. The pose is

* X.Avemetatarsalia also potentially excludes some obscure theropodesque things like X.Smok.

[†] Cast of specimen AMNH 6341, the most complete barosaurus specimen found.

[‡] The main lobby, on the second floor.

controversial; a number of scientists claim barosauruses are not able to stand so erect.

Brachiosaurus (G)

ETYMOLOGY: “arm lizard”, referring to the unusually long front limbs

TAXONOMY: OI.Sauropoda → X.Macronaria → Titanosauriformes → F.Brachiosauridae → **G.Brachiosaurus** ⇒ S.Altithorax

EXTENT: 154–153 Ma; western North America

DESCRIPTION:

SPECIMENS: First discovered by Elmer S. Riggs in Colorado in 1903.

Brontosaurus

ETYMOLOGY: “thunder lizard”

See Apatosaurus (G).

Buckland, William

EXTENT: 1784,0312–1856,0814 (72)

DESCRIPTION: The first person to write a scientific description of a fossilized dinosaur, namely a megalosaurus.

Carcharodontosauridae (F)

ETYMOLOGY: “shark-toothed lizards” (Greek)

TAXONOMY: OS.Theropoda → FSu.Allosauroida → X.Carcharodontosauria → **F.Carcharodontosauridae** ⇒ G.Giganotosaurus

EXTENT: 154–70 Ma; Americas and Asia

DESCRIPTION:

Carnosauria (<OS)

ETYMOLOGY: “meat lizards” (Latin and Greek)

TAXONOMY: OS.Theropoda → X.Avetheropoda → **X.Carnosauria** ⇒ FSu.Allosauroida ⇒ F.Allosauridae, F.Carcharodontosauridae

EXTENT: 171–70 Ma

DESCRIPTION: Originally a clade to throw large theropods, the definition of X.Carnosauria has become more rigorous since the 1980s to include allosuurs and their relatives.

Centrosaurus (G)

ETYMOLOGY: “pointed lizard”

TAXONOMY: O.Ornithischia → X.Cerapoda → OS.Ceratopsia → F.Ceratopsidae → FS.Centrosaurinae → **G.Centrosaurus**

EXTENT: 76.5–75.5 Ma; Canada

DESCRIPTION:

Cerapoda (<O)

ETYMOLOGY: “horn-footed”

TAXONOMY: O.Ornithischia → X.Genasauria → X.Neornithischia → **X.Cerapoda** ⇒ X.Ornithopoda, X.Marginocephalia

EXTENT:

DESCRIPTION: The cerapods are the duck-billeds (ornithopods) and the fringe-heads (ceratopsians and pachycephalosaurs, together the marginocephalians.).

Ceratosaurus (G)

ETYMOLOGY: “horn lizard” (Greek)

TAXONOMY: OS.Theropoda → X.Averostra → X.Ceratosauria → X.Neoceratosauria → F.Ceratosauridae → **G.Ceratosaurus** ⇒ S.Nasicornis

EXTENT: 153–148 Ma; North America, Portugal

DESCRIPTION: Ceratosauruses have a significant, rounded nasal horn. They also prominent, bony ridges in front of their eyes.

Chasmosaurinae (FS)

ETYMOLOGY: “opening lizards”, due to the large fenestrae in their frills

TAXONOMY: O.Ornithischia → X.Cerapoda → OS.Ceratopsia → F.Ceratopsidae → **FS.Chasmosaurinae** ⇒ **G.Triceratops**

EXTENT: 77–66 Ma; North America

DESCRIPTION: Chasmosaurines are distinguished from other ceratopsids by long frills without significant spines, and by prominent brow horns.

Chevron Bone

ETYMOLOGY:

DEFINITION: A *chevron bone* is one of a series of slender bones on the ventral side of the tail that protects nerves and blood vessels when the tail is used to support the body’s weight.

Coelurosauria (<OS)

ETYMOLOGY: “hollow-tailed lizard”

TAXONOMY: OS.Theropoda → X.Averostra → X.Tetanurae → X.Orionides → X.Avetheropoda → **X.Coelurosauria** ⇒

EXTENT:

DESCRIPTION: Almost all* feathered dinosaurs are coelurosaurs, and Currie hypothesizes that all coelurosaurs were feathered.

Cope, Edward Drinker

EXTENT: 1840,0728–1897,0412 (56)

DESCRIPTION:

Corythosaurus (G)

ETYMOLOGY: “helmet lizard” (Greek)

TAXONOMY: O.Ornithischia → X.Cerapoda → X.Ornithopoda → X.Hadrosauriformes → FSu.Hadrosauroida → F.Hadrosauridae → X.Lambeosaurini → **G.Corythosaurus** ⇒ S.Casuaris

EXTENT: 77–75.7 Ma; North America

DESCRIPTION:

SPECIMENS: The first specimen[†] was discovered by Barnum Brown in 1912 in Alberta. It has a nearly complete skeleton and impressions of skin. This specimen and a similar one discovered by Brown are on display in the AMNH’s Hall Of Ornithischian Dinosaurs.

Crurotarsi (X)

ETYMOLOGY: “crus-tarsused”, referring to the articulation between the crus and the tarsus

TAXONOMY: X.Sauropsida → X.Archosauromorpha → X.Archosauriformes → **X.Crurotarsi** ⇒ X.Archosauria, X.Phytosauria

* Which aren’t?

† AMNH 5240: 8.1 m, 3 Mg

EXTENT: 250–0 Ma; every continent

DESCRIPTION:

Cryolophosaurus (G)

ETYMOLOGY: “cold crest lizard” (Greek)

TAXONOMY: OS.Theropoda → X.Averostra → X.Tetanurae → **G.Cryolophosaurus** ⇒ S.Elliotti

EXTENT: 194–188 Ma; Antarctica

DESCRIPTION:

Ctenochasma (G)

ETYMOLOGY: “comb jaw” (Greek)

TAXONOMY: X.Archosauria → O.Pterosauria → OS.Pterodactyloidea → X.Lophocratia → OI.Archaeoptero-dactyloidea → X.Euctenochasmata → F.Ctenochasmatidae → FS.Ctenochasmatinae → **G.Ctenochasma** ⇒ S.Roemeri

EXTENT: 150–145 Ma; Germany, France

DESCRIPTION: Ctenochasmas are notable for their order 400 slender teeth.

SPECIMENS:

Deinonychus (G)

ETYMOLOGY: “terrible claw” (Greek)

TAXONOMY: OS.Theropoda → X.Maniraptora → X.Eumaniraptora → F.Dromaeosauridae → X.Eudromaeosauria → **G.Deinonychus** ⇒ S.Antirrhopus

EXTENT: 115–108 Ma; North America

DESCRIPTION:

Diadectes (G)

ETYMOLOGY: “crosswise biter”

TAXONOMY: X.Reptiliomorpha → O.Diadectomorpha → F.Diadectidae → **G.Diadectes** ⇒ S.Sideropelicus

EXTENT: 290–272 Ma; North America

DESCRIPTION: G.Diadectes is one of the first large terrestrial tetrapods and also among the first herbivorous tetrapods.

Diadectomorpha (O)

ETYMOLOGY: “crosswise-biter-shaped”

TAXONOMY: X.Reptiliomorpha → **O.Diadectomorpha** ⇒ G.Diadectes

EXTENT: 305–270 Ma; North America

DESCRIPTION: As non-amniotic reptiliomorphs, the diadectomorphs are very similar to amphibians.

Dilophosaurus (G)

ETYMOLOGY: “two-crest lizard” (Greek)

TAXONOMY: OS.Theropoda → X.Neotheropoda → F.Dilophosauridae → G.Dilophosaurus ⇒ S.Wetherilli

EXTENT: 193 Ma

DESCRIPTION: Dilophosauruses have a pair of distinct, rounded crests on top of their skulls. These crests are delicate, probably for display.

Dimorphodon (G)

ETYMOLOGY: “two-formed tooth” (Greek), referring to their two types of teeth

TAXONOMY: X.Archosauria → O.Pterosauria → X.Macronychoptera → F.Dimorphodontidae → FS.Dimorphodontinae → **G.Dimorphodon** ⇒ S.Macronyx

EXTENT: 195–190 Ma

DESCRIPTION:

SPECIMENS:

Dinosaur

ETYMOLOGY: “terrible/awesome lizard” (Greek)

DEFINITION: A *dinosaur* is a member of X.Dinosauria.

Dinosauria (X)

ETYMOLOGY: “terrible/awesome lizards” (Greek)

TAXONOMY: X.Archosauria → X.Avemetatarsalia → X.Dinosauromorpha → X.Dinosauriformes → X.Dinosauria ⇒ O.Saurischia, O.Ornithischia

EXTENT: 231–0 Ma

DESCRIPTION:

Dinotyrannus

ETYMOLOGY:

See Tyrannosaurus (G).

Diplodocidae (F)

ETYMOLOGY: “double-beams” due to their double-beamed chevron bones

TAXONOMY: OI.Sauropoda → X.Neosauropoda → FSu.Diplodocoidea → X.Flagellicaudata → F.Diplodocidae ⇒ G.Diplodocus, G.Apatosaurus

EXTENT: 154–93 Ma; western United States

DESCRIPTION:

Diplodocus (G)

ETYMOLOGY: “double-beamed” due to their double-beamed chevron bones

TAXONOMY: OI.Sauropoda → F.Diplodocidae → FS.Diplodocinae → G.Diplodocus ⇒ S.Longus

EXTENT: 154–150 Ma; western United States

DESCRIPTION:

Diracodon

ETYMOLOGY:

See Stegosaurus (G).

Dromaeosauridae (F)

ETYMOLOGY: “runner lizard” (Greek)

TAXONOMY: OS.Theropoda → X.Maniraptora → X.Eumaniraptora → X.Deinonychosauria → FSu.Dromaeosauroidae → F.Dromaeosauridae ⇒ G.Deinonychus, G.Velociraptor, G.Utahraptor

EXTENT: 160–66 Ma; North America

DESCRIPTION: Dromaeosaurids have a large, sickle-like claw on their second toe. The purpose of this claw is under debate, but the most reasonable hypothesis suggests they were used like crampons to climb up trees and prey, rather than as cutting implements.

Dsungaripterus (G)

ETYMOLOGY: “Junggar Basin wing” (Chinese, Greek)

TAXONOMY: X.Archosauria → O.Pterosauria → OS.Pterodactyloidea → X.Lophocratia → OI.EuPTerodactyloidea → X.Ornithocheiroidea → X.Azhdarchoidea → X.Neoazhdarhia → FSu.Dsungaripteroidea → F.Dsungaripteridae → G.Dsungaripterus ⇒ S.Weii

EXTENT: 145–101 Ma; China

DESCRIPTION:

SPECIMENS:

Duck-bill

See Hadrosauridae (F).

Dynamosaurus

ETYMOLOGY:

See Tyrannosaurus (G).

Edmontosaurus (G)

ETYMOLOGY:

TAXONOMY: O.Ornithischia → X.Cerapoda → X.Ornithopoda → F.Hadrosauridae → FS.Saurolophinae → T.Edmontosaurini → **G.Edmontosaurus** ⇒ S.Regalis

EXTENT: 73–66 Ma; North America

DESCRIPTION:

SPECIMENS: AMNH 5060: S.Annectens

Eoraptor (G)

ETYMOLOGY: “dawn thief” (Greek, Latin)

TAXONOMY: X.Dinosauria → O.Saurischia → X.Eusaurischia → **G.Eoraptor** ⇒ S.Lunensis

EXTENT: 231 Ma; Argentina (western Gondwana)

DESCRIPTION: Eoraptors are one of the oldest dinosaurs. Probably omnivorous, G.Eoraptor provides evidence that omnivorism developed quite early among dinosaurs. They have five fingers on each hand, three of which have prominent claws; the other two are too small to be used for predation.

Eudimorphodon (G)

ETYMOLOGY: “true two-formed tooth” (Greek)

TAXONOMY: X.Archosauria → O.Pterosauria → X.Eudimorphodontia → F.Eudimorphodontinae → **G.Eudimorphodon** ⇒ S.Ranzii

EXTENT: 210–203 Ma; Italy

DESCRIPTION: Eudimorphodons are the oldest known pterosaurs. They have order 100 dimorphic teeth which were well-suited to their pscivourous diet.

SPECIMENS: The first Eudimorphodon was discovered by Mario Pandolfi in 1973 in Bergamo, Italy.

Eusaurischia (<O)

ETYMOLOGY: “true lizard-hips” (Greek)

TAXONOMY: X.Dinosauria → O.Saurischia → **X.Eusaurischia** ⇒ OS.Sauropodomorpha, OS. Theropoda, G.Eoraptor

EXTENT: 231–0 Ma; every continent

DESCRIPTION: The eusaurischian pelvis is formed by three distinct bones: the ilium over the forward and downward pointing pubis, and over the backward and downward pointing ischium.

Fringe-head

See Marginocephalia (<O).

Giganotosaurus (G)

ETYMOLOGY: “giant southern lizard”

TAXONOMY: OS.Theropoda → FSu.Allosauroidea → F.Carcharodontosauridae → **G.Giganotosaurus** ⇒ S.Carolinii

EXTENT: 100–97 Ma; Argentina

DESCRIPTION:

Hadrosauridae (F)

ETYMOLOGY: “sturdy lizards” (Greek)

TAXONOMY: O.Ornithischia → X.Cerapoda → X.Ornithopoda → X.Hadrosauriformes → FSu.Hadrosauroida → **F.Hadrosauridae** ⇒ G.Hadrosaurus

EXTENT: 101–66 Ma; North America, Europe, Asia

DESCRIPTION: The duck-billed dinosaurs.

Hadrosauriformes (<O)

ETYMOLOGY: “sturdy-lizard-shaped” (Greek, Latin)

TAXONOMY: O.Ornithischia → X.Cerapoda → X.Ornithopoda → X.Iguanodontia → X.Dryomorpha → X.Ankylopollexia → X.Styracosterna → X.Hadrosauriformes ⇒ FSu.Hadrosauroida, X.Iguanodontoidea

EXTENT: 130–66 Ma; North America, Europe, Asia

DESCRIPTION:

Hadrosaurus (G)

ETYMOLOGY: “sturdy lizard” (Greek)

TAXONOMY: O.Ornithischia → X.Cerapoda → X.Ornithopoda → X.Hadrosauriformes → FSu.Hadrosauroida → F.Hadrosauridae → **G.Hadrosaurus** ⇒ S.Foulkii

EXTENT: 80 Ma; North America

DESCRIPTION:

Hypsirophus

ETYMOLOGY:

See Stegosaurus (G).

Ichthyopterygia (OSu)

ETYMOLOGY: “fish flippers”

TAXONOMY: X.Reptiliomorpha → X.Amniota → X.Sauropsida → X.Neodiapsida ⇒ **OSu.Ichthyopterygia** ⇒ O.Ichthyosauria, O.Grippidia

EXTENT: 252–66 Ma

DESCRIPTION:

Iguanodon (G)

ETYMOLOGY: “iguana-toothed”

TAXONOMY: O.Ornithischia → X.Cerapoda → X.Ornithopoda → X.Iguanodontia → X.Hadrosauriformes → FSu.Iguanodontoidea → F.Iguanodontidae → **G.Iguanodon**

EXTENT: 126–125 Ma; Belgium

DESCRIPTION:

Jeholopterus (G)

ETYMOLOGY: “Jehol wing” (Chinese, Greek), referring to the place of discover: Jehol (Chengde), China

TAXONOMY: X.Archosauria → O.Pterosauria → F.Anurognathidae → FS.Asiaticognathidae → **G.Jeholopterus** ⇒ S.Ninchengensis

EXTENT: 164 Ma; China

DESCRIPTION: The jeholopterus skull is wider than it is long, contrary to most other pterosaurs.

SPECIMENS: IVPP V12705 is nearly complete, with evidence of protofeathers and wing tissue.

Lepidosauria (OSu)

ETYMOLOGY: “scale lizards” (Greek)

TAXONOMY: X.Sauropsida → X.Neodiapsida → CI.Lepidosauromorpha → X.Lepidosauriformes → **OSu.Lepidosauria** ⇒ OS.Serpentes, Lizards

EXTENT: 250–0 Ma; every continent

DESCRIPTION: OSu.Lepidosauria are covered in overlapping scales. It contains snakes, lizards, and amphisbaenians (worm lizards).

Lepidosauromorpha (CI)

ETYMOLOGY: “scale-lizard-shaped” (Greek)

TAXONOMY: X.Reptiliomorpha → X.Amniota → X.Sauropsida → X.Neodiapsida → **CI.Lepidosauromorpha** ⇒ X.Lepidosauriformes, OSu.Sauropterygia

EXTENT: 260–0 Ma; every continent

DESCRIPTION:

Lophocratia (X)

ETYMOLOGY:

TAXONOMY: X.Archosauria → X.Avemmetatarsalia → X.Pterosauromorpha → O.Pterosauria → OS.Pterodactyloidea → **X.Lophocratia** ⇒ OI.Archaeoptero-dactyloidea, OI.Euptero-dactyloidea

EXTENT: 163–66 Ma (?)

DESCRIPTION:

Mammalia (C)

ETYMOLOGY: “teated” (Latin)

TAXONOMY: X.Synapsida → X.Mammaliaformes → **C.Mammalia** ⇒

EXTENT: 167–0 Ma; every continent

DESCRIPTION:

Manospondylus

ETYMOLOGY:

See Tyrannosaurus (G).

Marginocephalia (<O)

ETYMOLOGY: “fringe-heads”

TAXONOMY: O.Ornithischia → X. Genasauria → X.Cerapoda → X.Marginocephalia ⇒ OS.Ceratopsia, OS.Pachycephalosauria

EXTENT: 156–66 Ma

DESCRIPTION: The fringe-heads are the helmeted pachycephalosaurians and the beaked ceratopsians.

Megalosauroida (FSu)

ETYMOLOGY: “big-lizard-formed” (Greek)

TAXONOMY: OS.Theropoda → X.Tetanurae → Orionides → **FSu.Megalosauroida** ⇒ F.Megalosauridae, F.Spinosauridae

EXTENT: 170–84 Ma

DESCRIPTION:

Megalosaurus (G)

ETYMOLOGY: “big lizard” (Greek)

TAXONOMY: OS.Theropoda → Orionides → FSu.Megalosauroida → F.Megalosauridae → FS.Megalosaurinae → **G.Megalosaurus** ⇒ S.Bucklandii

EXTENT: 168–166 Ma; England

DESCRIPTION: SPECIMENS: G.Megalosaurus may have been the first dinosaur identified in scientific literature.

Neodiapsida (X)

ETYMOLOGY: “new diapsids”

TAXONOMY: X.Reptiliomorpha → X.Amniota → X.Sauropsida → X.Diapsida → **X.Neodiapsida** ⇒ X.Archosauromorpha, CI.Lepidosauromorpha, OSu.Ichthyopterygia

EXTENT: 270–0 Ma; every continent

DESCRIPTION: Basically X.Sauropsida less turtles, tortoises, and their relations.

Neornithischia (<O)

ETYMOLOGY: “new bird-hipped lizard”

TAXONOMY: O.Ornithischia → X. Genasauria → **X.Neornithischia**

EXTENT:

DESCRIPTION:

Neosauropoda (<OS)

ETYMOLOGY: “new lizard-foots”

TAXONOMY: X.Dinosauria → X.Eusaurischia → OS.Sauropodomorpha → X.Eusauropoda → **X.Neosauropoda** ⇒ FSu.Diplodocoidea, X.Macronaria

EXTENT:

DESCRIPTION:

Neotetanurae

ETYMOLOGY:

See Avetheropoda (<OS).

Nyctosaurus (G)

ETYMOLOGY:

TAXONOMY: X.Archosauria → O.Pterosauria → OS.Pterodactyloidea → X.Lophocratia → OI.Eupterodactyloidea → X.Ornithocheiroidea → X.Pteranodontia → F.Nyctosauridae → FS.Nyctosaurinae → **G.Nyctosaurus** ⇒ S.Gracilis

EXTENT: 85 Ma; United States

DESCRIPTION: Nyctosauruses are the only pterosaurs without claw fingers; their hands consist of a single wing finger. Due to this fact, it's hypothesized that nyctosauruses very rarely spent time on land.

Nyctosauruses also have an enormous, pronged horn which might have formed a large crest.*

SPECIMENS:

Orionides (<OS)

ETYMOLOGY:

TAXONOMY: OS.Theropoda → Neotheropoda → X.Averostra → X.Tetanurae → **X.Orionides** ⇒ FSu.Megalosauroida, X.Avetheropoda

EXTENT: 170–0 Ma

DESCRIPTION: The megalosauroids and avetheropods.

Ornithischia (O)

ETYMOLOGY: “bird-hipped”, which is confusing because birds are a member of O.Saurischia

TAXONOMY: X.Dinosauria → **O.Ornithischia** ⇒ X.Genasauria, X.Heterodontosauridae ⇒ X.Cerapoda

EXTENT: 231–66 Ma;

DESCRIPTION: A three-sectioned pelvis: ilium horizontal on top, pubis below with an extensions forward and angled down backward, ischium pointing back along the rear extension of the pubis.

Ornithocheiroidea (X)

ETYMOLOGY:

TAXONOMY: X.Archosauria → O.Pterosauria → OS.Pterodactyloidea → X.Lophocratia → OI.Euapterodactyloidea → **X.Ornithocheiroidea** ⇒ X.Azhdarchoidea, X.Pteranodontia

EXTENT: 130–75 Ma

DESCRIPTION:

SPECIMENS:

Ornithodira

ETYMOLOGY:

See Avemetatarsalia (X).

Ornithopoda (<O)

ETYMOLOGY: “bird-footed” (Greek), which is confusing because birds are a member of O.Saurischia

TAXONOMY: O.Ornithischia → X.Genasauria → X.Neornithischia → X.Cerapoda → **X.Ornithopoda** ⇒ X.Iguanodontia

EXTENT: 169–66 Ma

DESCRIPTION: While the older ornithopods have four-toed feet, the majority have three toes. The ornithopod pubis is very long, sometimes extending farther back than the ilium. They have no armor but have horny beaks. The duck-bills and similar dinosaurs are ornithopods.

Pachycephalosaurus (G)

ETYMOLOGY: “thick-headed lizard”

TAXONOMY: O.Ornithischia → X.Cerapoda → X.Marginocephalia → OS.Pachycephalosauria → F.Pachycephalosauridae → T.Pachycephalosaurini → **G.Pachycephalosaurus** ⇒ S.Wyomingensis

EXTENT: 72–66 Ma; western United States

DESCRIPTION:

Panaves

ETYMOLOGY: “all birds”

See Avemetatarsalia (X).

*Bennett argues against this.

Predentata

ETYMOLOGY:

See Ornithischia (O).

Psittacosaurus (G)

ETYMOLOGY: “parrot lizard” (Greek)

TAXONOMY: O.Ornithischia → X.Cerapoda → OS.Ceratopsia → F.Psittacosauridae → **G.Psittacosaurus** ⇒ S.Mongoliensis

EXTENT: 123–100 Ma; North America

DESCRIPTION: G.Psittacosaurus was named in 1923 by Henry Fairfield Osborn, former president of the AMNH.

SPECIMENS: The AMNH has a S.Mongoliensis specimen* on display which has a stomach containing a number of gastroliths. The AMNH also has the smallest hatchling specimen.†

Pteranodon (G)

ETYMOLOGY: “wing toothless” (Greek)

TAXONOMY: X.Archosauria → O.Pterosauria → OS.Pterodactyloidea → X.Lophocratia → OI.Euapterodactyloidea → X.Ornithocheiroidea → X.Pteranodontia → X.Pteranodontoidea → F.Pteranodontidae → FS.Pteranodontinae → **G.Pteranodon** ⇒ S.Longiceps

EXTENT: 86–85 Ma; North America

DESCRIPTION: Pteranodons are among the largest pterosaurs.

SPECIMENS:

Pteranodontia (<OI)

ETYMOLOGY: “wing-toothlesses” (Greek)

TAXONOMY: X.Archosauria → O.Pterosauria → OS.Pterodactyloidea → X.Lophocratia → OI.Euapterodactyloidea → X.Ornithocheiroidea → **X.Pteranodontia** ⇒ F.Nyctosauridae, X.Pteranodontoidea

EXTENT: 127–80 Ma

DESCRIPTION:

Pterodactyl

ETYMOLOGY: “winged finger” (Greek)

DEFINITION: A *pterodactyl* is a member of the pterosaur genus G.Pterodactylus. The term is commonly misused to refer any sort of pterosaur.

See Pterodactylus (G).

Pterodactylidae

ETYMOLOGY: “winged-fingers” (Greek)

See Euctenochasmata (X).

Pterodactyloidea (OS)

ETYMOLOGY: “winged lizards”

TAXONOMY: X.Archosauria → X.Avemotarsalia → X.Pterosauromorpha → O.Pterosauria → **OS.Pterodactyloidea** ⇒ X.Lophocratia ⇒ G.Pterodactylus, G.Pteranodon

EXTENT: 163–66 Ma

DESCRIPTION:

* AMNH 6254

† S.Mongoliensis, 11–13 cm

Pterodactylus (G)

ETYMOLOGY: “winged finger” (Greek)

TAXONOMY: X.Archosauria → O.Pterosauria → OS.Pterodactyloidea → X.Lophocratia → OI.Archaeoptero-dactyloidea → X.Euctenochasmata → **G.Pterodactylus** ⇒ S.Antiquus

EXTENT: 151–149 Ma; Bavaria

DESCRIPTION:

SPECIMENS: Cosimo Alessandro Collini described the first pterodactylus specimen in 1784, from a fossil unearthed in Bavaria.

Pterosauromorpha (X)

ETYMOLOGY: “winged-lizard-shaped”

TAXONOMY: X.Archosauria → X.Avemetatarsalia → **X.Pterosauromorpha** ⇒ O.Pterosauria

EXTENT: 228–66 Ma

DESCRIPTION:

Quetzalcoatlus (G)

ETYMOLOGY: “Quetzalcoatl” (Nahuatl*)

TAXONOMY: X.Archosauria → O.Pterosauria → X.Ornithocheiroidea → X.Azhdarchoidea → X.Neoazhdarchia → F.Azhdarchidae → **G.Quetzalcoatlus** ⇒ S.Northropii

EXTENT: 68–66 Ma; North America

DESCRIPTION: Quetzalcoatluses are one of the largest pterosaurs. As azhdarchids, quetzalcoatluses had no teeth.

SPECIMENS:

Reptile

See Reptilia.

Reptilia

ETYMOLOGY:

DEFINITION: A paraphyletic clade, *Reptilia* is X.Amniota less X.Dinosauria and less C.Mammalia.†

Reptiliomorpha (<CSu)

ETYMOLOGY:

TAXONOMY: CSu.Tetrapoda → **X.Reptiliomorpha** ⇒ X.Amniota, O.Diadectomorpha

EXTENT: 340–0 Ma; every continent

DESCRIPTION:

Rhamphorhynchus (G)

ETYMOLOGY: “beak snout”

TAXONOMY: X.Archosauria → O.Pterosauria → X.Macronychoptera → X.Novialoidea → X.Breviquartossa → F.Rhamphorhynchidae → FS.Rhamphorhynchinae → **G.Rhamphorhynchus** ⇒ S.Muensteri

EXTENT: 151–149 Ma; Europe, Tanzania

DESCRIPTION: Rhamphorhynchuses have large, forward-pointing teeth, that overlap when the mouth

* AKA Aztec

† I prefer monophyletic clades, meaning that for each member of the clade, its ancestors are also contained in the clade. Therefore, since dinosaurs evolved from early reptiles, dinosaurs should be considered reptiles. Further, since birds are dinosaurs, birds should also be considered reptiles. But, I think it’s better to use the common, paraphyletic definition of “reptile”—i.e. a reptile that isn’t a dinosaur or mammal—and say “reptiliomorph” instead of reptile; refer to Reptiliomorpha (X).

is closed; they were probably piscivorous.

SPECIMENS:

Saurischia (O)

ETYMOLOGY: “lizard-hipped” (Greek)

TAXONOMY: X.Dinosauria → **O.Saurischia*** ⇒ OS.Sauropodomorpha, OS. Theropoda, G.Eoraptor

EXTENT: 231–0 Ma; every continent

DESCRIPTION:

Sauropoda (OI)

ETYMOLOGY: “lizard-footed”

TAXONOMY: O.Saurischia → X.Eusaurischia → OS.Sauropodomorpha → X.Anchisauria → **OI.Sauropoda**

⇒ X.Neosauropoda

EXTENT: every continent

DESCRIPTION:

Sauropodomorpha (OS)

ETYMOLOGY: “lizard-footed forms”

TAXONOMY: O.Saurischia → X.Eusaurischia → **OS.Sauropodomorpha** ⇒ X.Plateosauria

EXTENT: 230–66 Ma

DESCRIPTION:

Sauropsida (X)

ETYMOLOGY: “lizard-faced”

TAXONOMY: X.Reptiliomorpha → X.Amniota → **X.Sauropsida** ⇒ X.Neodiapsida, Anapsida

EXTENT: 312–0 Ma; every continent

DESCRIPTION: Sauropsids are the nonmammalian amniotes. Therefore, X.Sauropsid contains archosaurs, plesiosaurs, ichthyosaurs, turtles, tortoises, snakes, and lizards.

Sauropterygia (OSu)

ETYMOLOGY: “lizard flippers” (Greek)

TAXONOMY: X.Sauropsida → X.Neodiapsida → CI.Lepidosauromorpha → **OSu.Sauropterygia** ⇒

O.Plesiosauria

EXTENT: 252–66 Ma; every continent

DESCRIPTION:

Seismosaurus

ETYMOLOGY: “earthquake lizard”

See *Diplodocus* (G).

Spinosaurus (G)

ETYMOLOGY: “spine lizard”

TAXONOMY: OS.Theropoda → FSu.Megalosauroida → F.Spinosauridae → FS.Spinosaurinae →

G.Spinosaurus ⇒ S.Aegyptiacus

EXTENT: 112–97 Ma; North Africa

DESCRIPTION: A contender for the largest carnivorous dinosaur, the skull of G.Spinosaurus is long and narrow like that of the crocodilians. Their diet consisted of fish, as they lived both in and out of water.

*Seeley defined Saurischia to be an order in 1888, but now many consider it unranked; I see no reason to not call it an order.

Stegosauria (OS)

ETYMOLOGY: “roof/covered lizards”

TAXONOMY: O.Ornithischia → X. Genasauria → X.Thyreophora → X.Eurypoda → **OS.Stegosauria**
⇒ F.Stegosauridae ⇒ G.Stegosaurus

EXTENT:

DESCRIPTION:

Stegosaurus (G)

ETYMOLOGY: “roof/covered lizard”

TAXONOMY: O.Ornithischia → X.Eurypoda → OS.Stegosauria → F.Stegosauridae → **G.Stegosaurus**
⇒ S.Armatus

EXTENT: 155–150 Ma; western United States, Portugal

DESCRIPTION:

Stygivenator

ETYMOLOGY:

See Tyrannosaurus (G).

Suchomimus (G)

ETYMOLOGY: “crocodile mimic”

TAXONOMY: OS.Theropoda → FSu.Megalosauroida → F.Spinosauridae → FS.Baryonychinae → **G.Suchomimus** ⇒ S.Tenerensis

EXTENT: 121–113 Ma; Niger

DESCRIPTION:

Synapsida (X)

ETYMOLOGY: “fused-arched”; AKA *stem mammals, protomammals*

TAXONOMY: X.Reptiliomorpha → X.Amniota → **X.Synapsida** ⇒ Therapsida, Pelycosauria ⇒ C.Mammalia

EXTENT: 308–0 Ma; every continent

DESCRIPTION:

Tetanurae (<OS)

ETYMOLOGY: “stiff tails”

TAXONOMY: OS.Theropoda → X.Neotheropoda → X.Averostra → **X.Tetanurae** ⇒ X.Orionides, G.Cryolophosaurus

EXTENT: 201–0 Ma

DESCRIPTION:

Tetrapoda (CSu)

ETYMOLOGY: “four-footed” (Greek)

TAXONOMY: K.Anamalia → P.Chordata → PS.Vertebrata → PI.Gnathostomata → **CSu.Tetrapoda**
⇒ X.Reptiliomorpha, C.Amphibia

EXTENT: 395–0 Ma

DESCRIPTION: The reptiliomorphs and amphibians split around 370 Ma. Around 360 Ma, trapods began to go onto land to prey on air-breathing arthropods. Able to lay eggs on land, the amniotes out-competed the amphibians during the Triassic Period.

Theropoda (OS)

ETYMOLOGY: “beast-footed” (Greek)

TAXONOMY: X.Dinosauria → O.Saurischia → X.Eusaurischia → **OS.Theropoda** ⇒ Neotheropoda ⇒ X.Averostra, X.Dilophosauridae

EXTENT: 230–0 Ma; every continent

DESCRIPTION:

Theropsida

ETYMOLOGY: “beast-faced”

See Synapsida (X).

Thyreophora (<O)

ETYMOLOGY: “shield bearers”, AKA *armored dinosaurs*

TAXONOMY: O.Ornithischia → X. Genasauria → **X.Thyreophora** ⇒ OS.Ankylosauria, OS.Stegosauria

EXTENT: 200–66 Ma

DESCRIPTION:

Triceratops (G)

ETYMOLOGY: “three-horn face”

TAXONOMY: O.Ornithischia → X.Cerapoda → X.Marginocephalia → OS.Ceratopsia → F.Ceratopsidae → FS.Chasmosaurinae → T.Triceratopsini → **G.Triceratops**

EXTENT: 68–66 Ma; North America

DESCRIPTION:

Troodon (G)

ETYMOLOGY: “wooding tooth” (Greek)

TAXONOMY: OS.Theropoda → X.Coelurosauria → X.Maniraptora → X.Eumaniraptora FSu.Troodontoidea → F.Troodontidae → FS.Troodontinae → **G.Troodon** ⇒ S.Formosus

EXTENT: 78–69 Ma; North America

DESCRIPTION: Troodons sport prominent serrations on their teeth.

SPECIMENS: A troodon discovered in Montana in 1855 by F. V. Hayden is one of the first dinosaurs discovered in North America.

Tylosteus

ETYMOLOGY:

See Pachycephalosaurus (G).

Tyrannoraptora (<OS)

ETYMOLOGY:

TAXONOMY: X.Avetheropoda → X.Coelurosauria → **X.Tyrannoraptora**

Tyrannosaur

ETYMOLOGY: “tyrant lizard”

See Tyrannosauroida (FSu).

Tyrannosauridae (F)

ETYMOLOGY: “tyrant lizards”

TAXONOMY: X.Avetheropoda → X.Coelurosauria → X.Tyrannoraptora → FSu.Tyrannosauroida →

F.Tyrannosauridae

EXTENT: ~66 Ma; North America, Asia

DESCRIPTION:

Tyrannosauroida (FSu)

ETYMOLOGY: “tyrant-lizard-shaped”

TAXONOMY: X.Avetheropoda → X.Coelurosauria → X.Tyrannoraptora → FSu.Tyrannosauroida

EXTENT: 201–66 Ma; North America, Europe, Asia, South America and possibly Australia*

DESCRIPTION:

Tyrannosaurus (G)

ETYMOLOGY: “tyrant lizard”

TAXONOMY: OS.Theropoda → X.Coelurosauria → FSu.Tyrannosauroida → F.Tyrannosauridae →

FS.Tyrannosaurinae → G.Tyrannosaurus ⇒ S.Rex

EXTENT: 67–66 Ma; North America, Asia

DESCRIPTION:

Utahraptor (G)

ETYMOLOGY: “Utah thief”

TAXONOMY: OS.Theropoda → X.Coelurosauria → X.Maniraptora → X.Eumaniraptora →

F.Dromaeosauridae → X.Eudromaeosauria → FS.Dromaeosaurinae → G.Utahraptor ⇒ S.Ostrommaysorum

EXTENT: 126 Ma

DESCRIPTION: Utaraptors are the largest dromaeosaurids.

Velociraptor (G)

ETYMOLOGY: “swift thief”

TAXONOMY: OS.Theropoda → X.Maniraptora → X.Eumaniraptora → F.Dromaeosauridae →

X.Eudromaeosauria → FS.Velociraptorinae → G.Velociraptor ⇒ S.Mongoliensis

EXTENT: 75–71 Ma; Mongolia

DESCRIPTION:

Appendix

Time

[It would be neat to include maps, to get an idea of the geography during the different periods.]

NOTE All times are approximate.

There are four *geological eons*:

1. Phanerozoic (0–542 Ma): “visible life”
2. Proterozoic (542–2500 Ma): “earlier life”
3. Archean (2500–4000 Ma)

*Which ones?

4. Hadean (4000–4500* Ma): “of Hades”

The most youngest eon, the Phanerozoic Eon, is divided into three *geological eras*:

1. Cenozoic (0–66 Ma): “new life”, AKA the *age of mammals*
2. Mesozoic (66–252 Ma): “middle life”, AKA the *age of reptiles*
3. Paleozoic (252–542 Ma): “ancient life”

Each era is divided into *geological periods*:

1. [...]
2. Cretaceous (66–145 Ma): “of chalk”, AKA *K*
 - (a) Late (66–101 Ma)
 - (b) Early (101–145 Ma)
3. Jurassic (145–201 Ma): “of Jura Mountains”
 - (a) Late (145–164 Ma): G.Diplodocus, G.Apatasaurus, Camarasaurus, Brachiosaurus, Haplocanthosaurus, Allosaurus, Stegosaurus, Certasaurus
 - (b) Middle (164–174 Ma)
 - (c) Early (174–201 Ma)
4. Triassic (201–252 Ma): “of the three-layered strata between Jurassic and Permian”
 - (a) Late (201–235 Ma)
 - (b) Middle (235–247 Ma)
 - (c) Early (247–252 Ma)
5. [...]

*Remember, Earth is only 4.54 Ba old.