

Dinosaurs for Kids

An Introduction to
Dinosaur Paleontology



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Triceratops



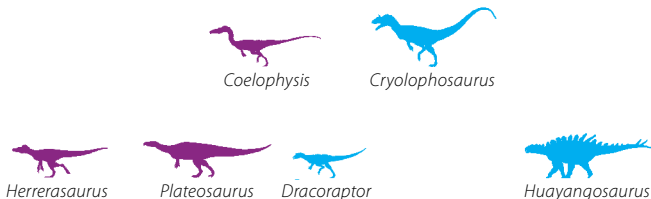
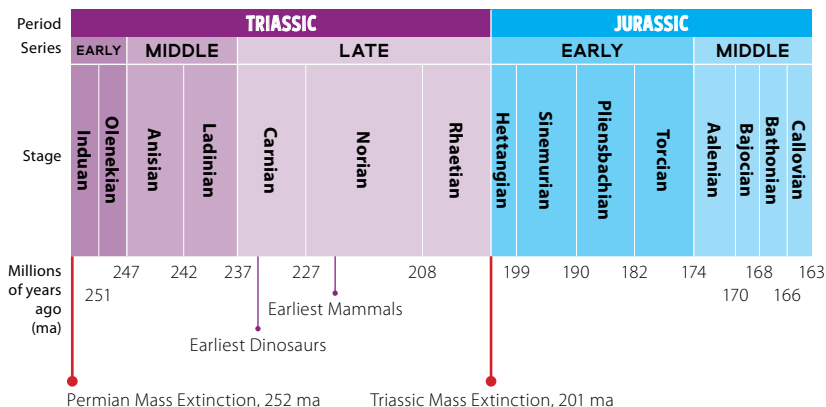
The History of Life on Earth

We measure time in minutes, hours, days, weeks, months, and years. As we get older, decades. But as soon as we try to consider the passage of longer periods of time (centuries, or tens and hundreds of millions of years), we have difficulty understanding the concept. To help make sense of it, we use a scale that divides Earth's history into sections.

Scientists believe the Earth formed about 4.5 billion years ago, and that the earliest forms of life appeared between 4.1 and 3.8 billion years ago. This was simple, single-celled life like bacteria. The first multicellular life appeared between 2 and 2.5 billion years ago. Fungi may be the oldest multicelled

Life in the Mesozoic

The Mesozoic Era, also called the “Age of Reptiles” is the time when dinosaurs lived. It began 252 million years ago and ended 66 million years ago with the mass extinction at the end of the Cretaceous. The Mesozoic is separated into three periods: the Triassic, the Jurassic, and the Cretaceous. Within each period, there are shorter stages that identify specific time periods in Earth’s history.



The First Dinosaurs

Dinosaurs most likely evolved from a small, bipedal reptile in the middle to late Triassic Period, around 230–235 million years ago.

The earliest dinosaurs discovered so far include *Eoraptor*, *Panphagia*, *Herrerasaurus*, and *Pisanosaurus*. These dinosaurs all date from the late Triassic Period, about 230 million years ago, and were discovered in South America.

These were all small dinosaurs that ran on two legs, with *Eoraptor* and *Pisanosaurus* measuring just 2–4 feet tall, and *Herrerasaurus* being larger at up to 17 feet long.



The early dinosaur *Herrerasaurus* chasing *Eoraptor*, *Pisanosaurus*, and *Panphagia* in the late Triassic.



CARNOTAURUS

Pronunciation: kahrn-uh-TAWR-us

Meaning: Meat-eating bull

Lifestyle: Carnivore

Location: South America (Brazil)

Time Period: Late Cretaceous (Maas-trichtian) 71–69 ma

Size: 23 ft

Carnotaurus is known from its appearance in several popular movies. It is unique in having a pair of large horns above its eyes, giving it a bull-like appearance, and inspiring its discoverers to name it the “meat-eating bull.” Though not as large as it’s been depicted in movies, *Carnotaurus* had extremely long hind limbs, a feature typical of fast-running animals. Skin impressions were found when *Carnotaurus* was discovered, and they showed that it had large scutes or osteoderms running down its sides.



MAJUNGASAURUS

Pronunciation: mah-jun-gah-SAWR-us

Meaning: Majunga lizard

Lifestyle: Carnivore

Location: Africa (Madagascar)

Time Period: Late Cretaceous (Maas-trichtian) 70–66 ma

Size: 23 ft

Majungasaurus was unique in having a wrinkled appearance to the bones on its snout. Like all abelisaurids, *Majungasaurus* had extremely small forelimbs that had become entirely useless. They likely preyed upon some of the smaller dinosaurs that populated Madagascar during the late Cretaceous, but they also may have fed on each other. Bones of *Majungasaurus* have been found that have tooth marks from another *Majungasaurus*—evidence of cannibalism!



VELOCIRAPTOR

Pronunciation: veh-loss-ih-RAP-tor

Meaning: Fast thief

Lifestyle: Carnivore

Location: Asia (Mongolia)

Time Period: Late Cretaceous (Campanian to Maastrichtian) 75–71 ma

Size: 5 ft

Much smaller than depicted in movies, *Velociraptor* was a fast and deadly predator. One famous discovery, dubbed the “Fighting Dinosaurs,” preserves a *Velociraptor* and *Protoceratops* locked in what appears to be combat, with the *Velociraptor*’s sickle claw positioned into the *Protoceratops*’ neck. It’s thought that the two died when a sudden sandstorm trapped them. Their defining feature is the long, sharp “killing claw” on the hind foot, present in all raptors.



DEINONYCHUS

Pronunciation: dye-NON-ik-us

Meaning: Terrible claw

Lifestyle: Carnivore

Location: North America (USA, Montana, Wyoming, Utah, Oklahoma)

Time Period: Early Cretaceous (Aptian to Albian) 115–108 ma

Size: 11 ft

Deinonychus teeth have been found with the remains of the plant-eating dinosaur *Tenontosaurus*, which means they may have fed on the large herbivore. *Deinonychus* is important for being the dinosaur that led paleontologists John Ostrom and Robert Bakker to reimagine dinosaurs as fast, nimble, warm-blooded creatures. *Deinonychus*, like all raptors, was covered in feathers, and small knobs on the bones of their forearms called “quill knobs” show they would have had longer, winglike feathers on their arms.



APATOSAURUS

Pronunciation: ah-PAT-uh-SAWR-us

Meaning: Deceptive lizard

Lifestyle: Herbivore

Location: North America (USA, Colorado, Wyoming, New Mexico, Oklahoma, Utah)

Time Period: Late Jurassic (Kimmeridgian to Tithonian) 152–150 ma

Size: 75 ft

Apatosaurus is the “typical” sauropod familiar to most people. Long known as *Brontosaurus*, that name fell out of favor in the last half of the 20th century. Recent research, however, has revived the name and assigned it to what was once considered a species of *Apatosaurus* (now known as *Brontosaurus excelsus*). It’s all very confusing, though not uncommon in paleontology, where new research methods may reverse previous findings.



BAROSAURUS

Pronunciation: bahr-oh-SAWR-us

Meaning: Heavy lizard

Lifestyle: Herbivore

Location: North America (USA, Utah, South Dakota, Colorado, Oklahoma, Wyoming)

Time Period: Late Jurassic (Tithonian) 152–150 ma

Size: 89 ft

Barosaurus lived in what is now the Morrison Formation alongside many better-known sauropods, including *Apatosaurus*, *Brontosaurus*, *Diplodocus*, and *Brachiosaurus*. *Barosaurus* had a relatively longer neck than its diplodocid cousins and, despite its name meaning, was a more lightly built animal overall.



BRACHYTRACHELOPAN

Pronunciation:

brak-ee-trak-ehl-OH-pan

Meaning: Short-necked Pan

Lifestyle: Herbivore

Location: South America (Argentina)

Time Period: Late Jurassic (Oxfordian to Tithonian) 160–150 ma

Size: 35 ft

This small sauropod has a very short neck (the shortest of any known sauropod). It was found in the Cañadón Cálceros Formation in southern Argentina and shared its environment with an as-yet-undescribed, large predator and another sauropod. Exactly how and why it evolved such a short neck is unclear, but it likely helped facilitate browsing on low-growing plants and ferns.



DICRAEOSAURUS

Pronunciation: dye-KRAY-ohSAWR-us

Meaning: Double-forked lizard

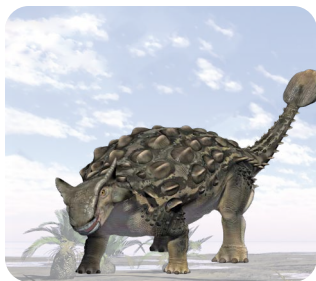
Lifestyle: Herbivore

Location: Africa (Tanzania)

Time Period: Late Jurassic (Kimmeridgian to Tithonian) 155–150 ma

Size: 49 ft

The dicraeosaurids are known for their split or bifurcated neck and back spines. In the case of *Dicraeosaurus*, this created a low sail along its back. This was the first of the dicraeosaurids to be recognized, and the group takes its name from this genus. *Dicraeosaurus* was found in the Tendaguru Formation of Tanzania in Africa, which was also home to the stegosaur *Kentrosaurus* and the macronarian sauropod *Giraffatitan*.



ANKYLOSAURUS

Pronunciation: AN-kye-loe-SAWR-us

Meaning: Fused or bent lizard

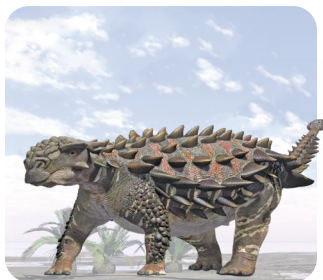
Lifestyle: Herbivore

Location: North America (USA, Montana, Wyoming, New Mexico; Canada, Alberta)

Time Period: Late Cretaceous (Maas-trichtian) 68–66 ma

Size: 26 ft

The best known of the ankylosaurs was also one of the last surviving members of the group. *Ankylosaurus* is the largest ankylosaur known so far, reaching lengths of up to 26 feet. With its massive tail club and heavily armored body, it would have been a formidable rival of *Tyrannosaurus rex* that shared its environment. The exact arrangement of its armor has been a subject of debate. It does not appear to have had spikes along its sides (though it's often depicted this way), and agreement on how the plates on its back were arranged has changed as new researchers have studied it.



SAICHANIA

Pronunciation: say-KAN-ee-ah

Meaning: Beautiful one

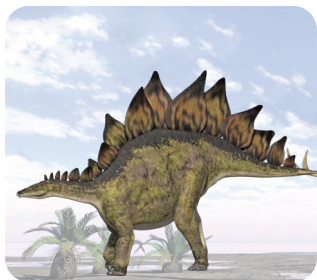
Lifestyle: Herbivore

Location: Asia (Mongolia)

Time Period: Late Cretaceous (Campanian) 75–70 ma

Size: 22 ft

Saichania was a heavily armored ankylosaur that shared its habitat with other ankylosaurs, including *Tarchia* and *Zaraapelta*. The Barun Goyot Formation, where its remains were found, preserve a desert environment of sand dunes and oases, but it must have contained enough low-growing vegetation to support a vast array of large-bodied plant eaters.



STEGOSAURUS

Pronunciation: STEG-uh-SAWR-us

Meaning: Roofed lizard

Lifestyle: Herbivore

Location: North America (USA, Colorado, Montana, Oklahoma, Utah, Wyoming)

Time Period: Late Jurassic (Kimmeridgian to Tithonian) 155–145 ma

Size: 21 ft

This well-known and popular dinosaur is found in the Morrison Formation of the western United States. For a long time, it was reported that *Stegosaurus* had a second brain located in its hip to help control the movement of its tail. This isn't true. Researchers still debate the purpose of the tall plates along its back. They may have helped regulate body temperature, they may have been used to defend itself against predators, attract mates, or intimidate rivals. Its tail spikes, known as its **thagomizer**, were clearly used to defend itself against predatory dinosaurs like *Allosaurus* and *Ceratosaurus*.



GIGANTSPINOSAURUS

Pronunciation:

Jye-gant-spy-no-SAWR-us

Meaning: Giant spined lizard

Lifestyle: Herbivore

Location: Asia (China)

Time Period: Late Jurassic (Oxfordian) 165 ma

Size: 14 ft

What sets *Gigantspinosaurus* apart from other stegosaurs is its enormous shoulder spikes. Their purpose is unclear, but they would have provided effective defense against predators.



TSINTAOSAURUS

Pronunciation: SIHN-towe-SAWR-us

Meaning: Qingdao lizard

Lifestyle: Herbivore

Location: Asia (China)

Time Period: Late Cretaceous (Campanian) 83–70 ma

Size: 27 ft

When *Tsintaosaurus* was first discovered, it was described as the duckbilled unicorn because it appeared to have a large spike sticking out of the top of its head. Later discoveries showed that this was just a piece of a larger crest that adorned its head.



PARASAUROLOPHUS

Pronunciation:

PAR-ah-sawr-AWL-oh-fus

Meaning: Near-crested lizard

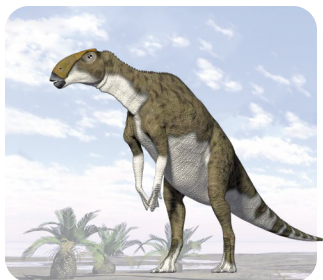
Lifestyle: Herbivore

Location: North America (Canada, Alberta; USA, New Mexico)

Time Period: Late Cretaceous (Campanian) 76–73 ma

Size: 31 ft

Parasaurolophus is one of the most familiar duckbills, thanks to the long crest on top of its head. The exact purpose of the crest has remained a bit of a mystery. It was originally thought that the crest served as a snorkel that allowed it to breath underwater. Now scientists believe that it may have acted as a resonating chamber for sounds and may have been brightly colored and used as display. There are three species of *Parasaurolophus*, all of them bearing tube-like crests of varying sizes.



BRACHYLOPHOSAURUS

Pronunciation:

BRAK-ee-loff-oh-SAWR-us

Meaning: Short-crested lizard

Lifestyle: Herbivore

Location: North America (Canada, Alberta; USA, Montana, Utah)

Time Period: Late Cretaceous (Campanian) 81–76 ma

Size: 30 ft

The remains of several *Brachylophosaurus* have been found, most notably a mummified individual that has been nicknamed Leonardo. Leonardo is exceptionally well-preserved, with several areas of skin in excellent condition and even the contents of its guts, which showed that it ate leaves, ferns, conifers, and some early flowering plants like magnolias. Despite being one of the “uncrested” hadrosaurs, *Brachylophosaurus* had a small, flat crest on the top of its head.



GRYPOSAURUS

Pronunciation: grip-oh-SAWR-us

Meaning: Hooked-nose lizard

Lifestyle: Herbivore

Location: North America (Canada, Alberta; USA, Montana, Utah)

Time Period: Late Cretaceous (Campanian) 80–75 ma

Size: 26 ft

Gryposaurus and its close relative *Kritosaurus* are easily recognized by the big arching nose that gives it its name. The gryposaurs were a wide-ranging group that populated swamps and marshes from the Gulf of Mexico to Alberta, Canada, during the late Cretaceous.



CENTROSAURUS

Pronunciation: sen-troe-SAWR-us

Meaning: Pointed lizard

Lifestyle: Herbivore

Location: North America (Canada, Alberta)

Time Period: Late Cretaceous (Campanian) 87–75 ma

Size: 16–18 ft

Centrosaurus was a very common dinosaur in its environment. Vast bone beds containing the remains of hundreds of individuals have been found. We've learned a lot about its growth stages from very young to adult specimens. *Centrosaurus's* nose horn and the small hornlets around the rim of its shield varied throughout its age, and even in adults there is a lot of variation, with some nose horns pointing forward, some backwards, and some nearly straight.



STYRACOSAURUS

Pronunciation: stih-RAK-uh-SAWR-us

Meaning: Spiked lizard

Lifestyle: Herbivore

Location: North America (Canada, Alberta)

Time Period: Late Cretaceous (Campanian) 75–74 ma

Size: 16–18 ft

Styracosaurus had a dramatic display of long horns radiating out from the edge of its frill. As with most horned dinosaurs, there was some variation between individuals in the angle and length of the horns. The exact purpose of the horns and frills of horned dinosaurs is still a matter of debate. It seems very likely that they were used as displays to signal potential mates or to help distinguish themselves from other ceratopsians.



PACHYCEPHALOSAURUS

Pronunciation:

PAK-ee-sef-ah-low-SAWR-us

Meaning: Thick-headed lizard

Lifestyle: Herbivore

Location: North America (USA, Montana, Wyoming, South Dakota; Canada, Alberta)

Time Period: Late Cretaceous (Maas-trichtian) 68–66 ma

Size: 16 ft

For a long time, pachycephalosaurs were shown butting heads like bighorn sheep. Now it's believed they used their thickened heads to ram into the sides of rivals. Two other pachycephalosaurs that have been found in North America, *Dracorex* and *Stygimoloch*, are considered juvenile versions of *Pachycephalosaurus*. *Pachycephalosaurus* is the largest pachycephalosaur known, reaching two to three times the length of all others.



STEGOCERAS

Pronunciation: STEH-go-SEHR-ahs

Meaning: Horn roof

Lifestyle: Herbivore

Location: North America (Canada, Alberta; USA, Montana, New Mexico)

Time Period: Late Cretaceous (Campanian) 77–74 ma

Size: 6–8 ft

This little dinosaur packed quite a punch with its thickened skull roof rimmed by small knobs and blunted spikes. *Stegoceras* is one of the best-known pachycephalosaurs. All that's been found of most "pachys" is the head dome or (rarely) a full skull. But a nearly complete skeleton of *Stegoceras* has been found, and it formed the basis for what we assume its relatives looked like.



Bring the Past Back to Life!

Become a young paleontologist. Learn all about the Mesozoic Era. James Kuether, an acclaimed paleoartist, presents a kids' introduction to dinosaurs. From some of the earliest dinosaurs, like *Eoraptor*, to the most famous dinosaurs, such as *Tyrannosaurus rex*, this comprehensive book provides the information that you want to know.

INSIDE YOU'LL FIND

- Identification guide to 150 dinosaurs and non-dinosaurs
- The basics of fossils, fossil collecting, and paleontology
- Tips on how to become a paleontologist and start a fossil collection



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