



Adventures From the Land of Dinosaurs

The Age of Reptiles



The Mesozoic lasted from 252 to 66 million years ago. At the start of the period, like the crocodile-like phytosaurs, were dominant, while dinosaurs were small and rare. It wouldn't be until the Jurassic that dinosaurs began to rule the Earth. During this time, birds and animals also evolved. They would flourish after the dinosaurs met a rather unfortunate end ...





The Supercontinent of Pangea



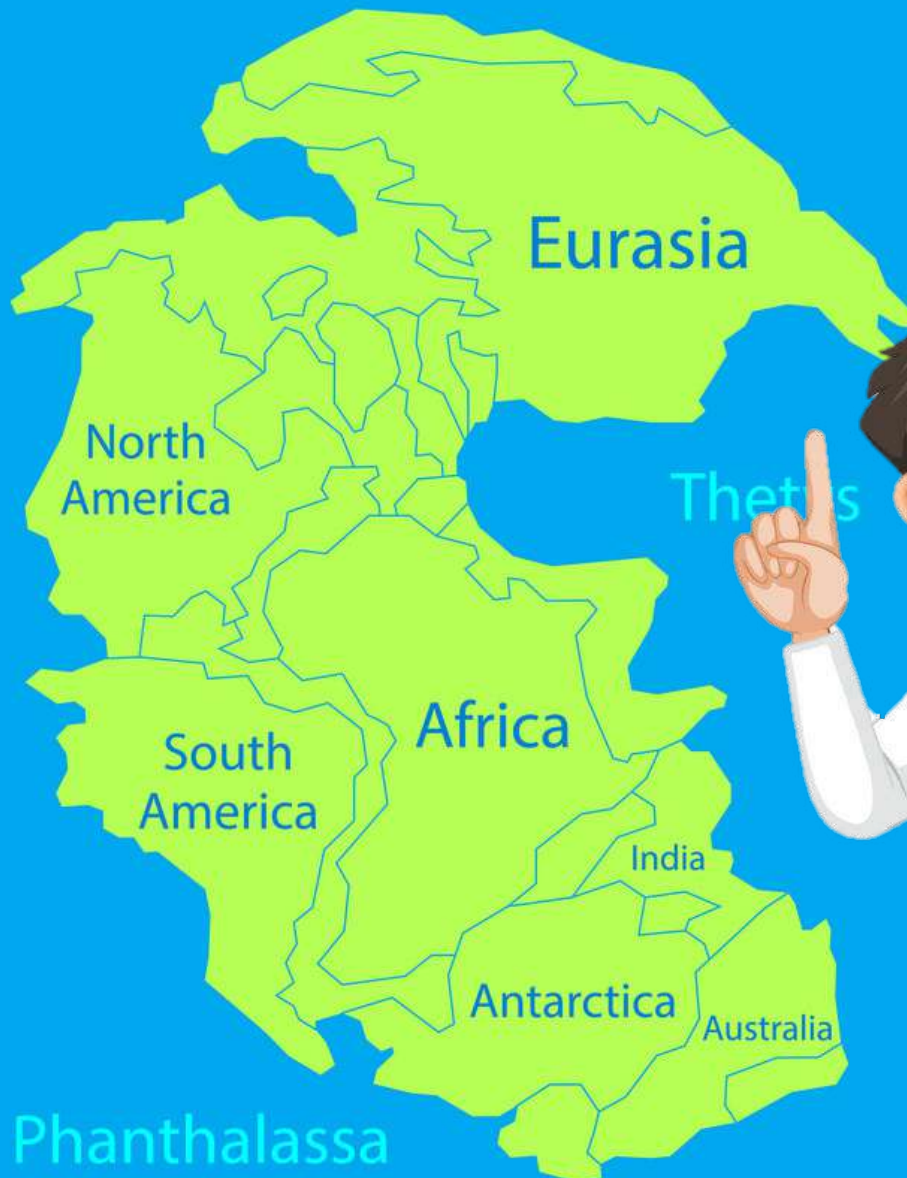
Have you ever noticed how South America and Africa look like puzzle pieces that would fit together? Well, they did! Earth was once dominated by the supercontinent Pangaea.

Some of the main pieces of evidence for Pangaea are fossils. Several species have been found on very different continents today, suggesting that these land masses were once joined.



A Different World

About 300 million years ago, Earth's land masses came together, forming a supercontinent that reached from pole to pole. It started breaking up roughly 200 million years ago. As the continents drifted apart, they would eventually reach their modern configuration. This map shows where today's land masses fitted into Pangaea ...



This dog-sized animal was one of the few survivors of the extinction event at the end of the Permian. It was very common in the early Triassic. Fossils have been found in Africa, India and Antarctica.

Lystrosaurus



Fossils of this predator have been found in South American and Africa. It was just over 1 m (3 ft) long and closely related to mammals. Dimples on the skull suggest it might have had whiskers.

Cynognathus



This reptile from the early Permian spent some of its time on land and some in the water. It had nostrils on the top of its snout, like a crocodile. Fossils have been found in South America and Africa.

Mesosaurus



The long, tongue-shaped leaves from this Permian tree have been found in South America, Africa, India, Antarctica and Australia! It grew in wet, acidic soils and was up to 30 m (100 ft) tall. Some scientists think it was deciduous, which means it dropped its leaves seasonally.

Glossopteris



The Triassic Footprints



In 1980, a year after construction started in a Poland, palaeontologist, Tadeusz Ptaszynski found three unusual slabs of rock. On them were fossil footprints. And they weren't alone – during the following years, tons and tons of fossil footprints were collected.



Out of the roughly 3500 individual footprints, a few were made by the earliest dinosauromorphs. I know what you're thinking – what's a dinosauromorph? A dinosauromorph that can morph into other dinosaurs? Well, I'm afraid not. These weren't actually dinosaurs, but close relatives, also known as proto dinosaurs.



Some of the footprints, from an animal called Protodactylus, were about 250 million years old. And they revealed fascinating secrets of the past.

Protodactylus Footprint



Based on the ancient imprints, researchers were able to reconstruct what the animal that made them might have looked like.





Prorotodactylus was cat-sized and walked on all fours. It held its legs directly under its body, not sprawled to the sides like a lizard. And when it was walking, only its toes touched the ground.

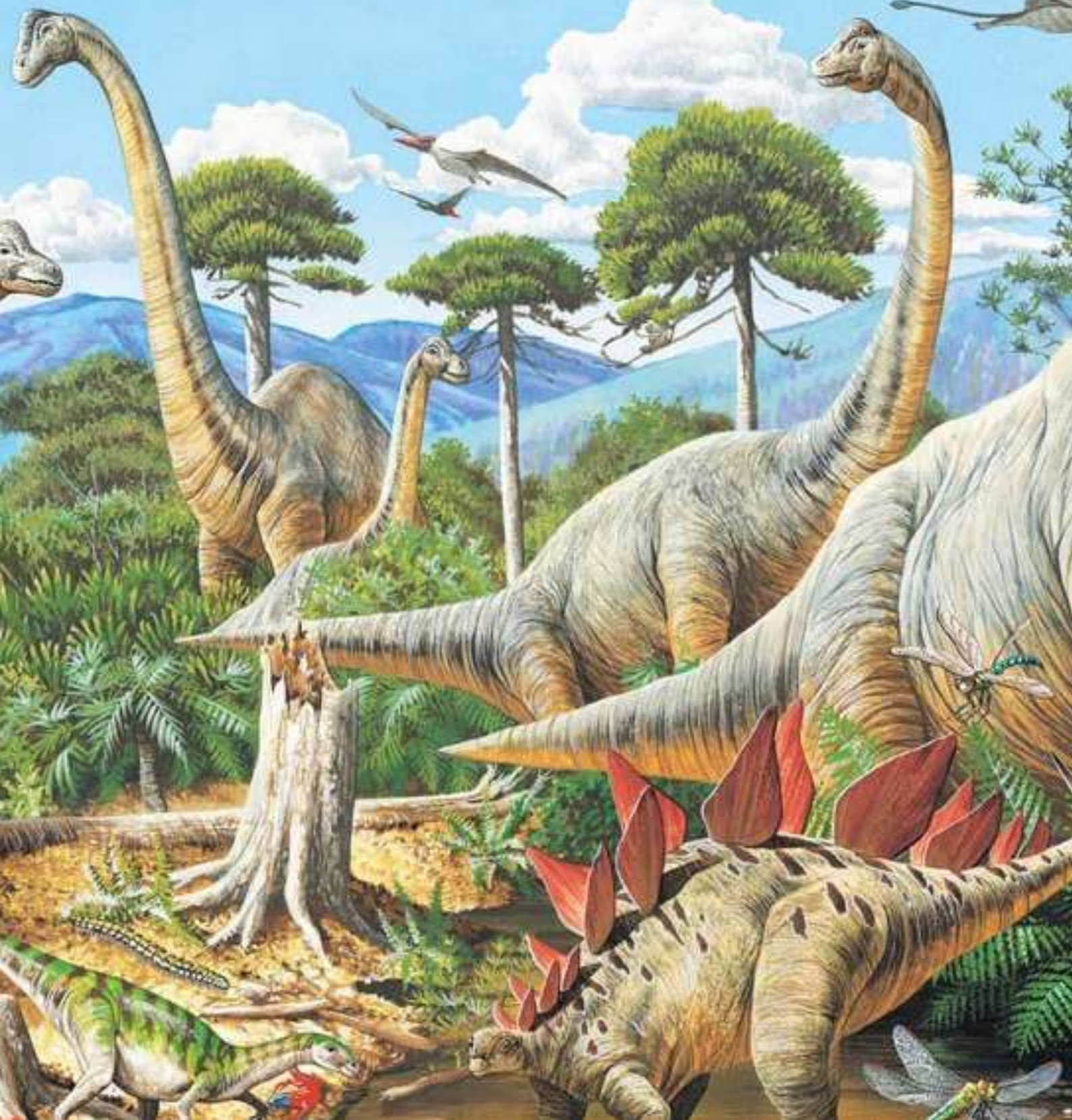
Based on the big spaces between the footprints, its limbs must have been pretty long. And since the footprints went over the handprints, scientists think its legs would have been longer than its arms. So, all in all, poor Prorotodactylus was kind of an awkward-looking animal.

Another surprising thing was how rare the dinosaur tracks were compared to all of the other animal tracks preserved with them. This meant dinosaurs and their ancestors were minor players in their habitats when they first evolved. That, of course, would soon change...





What Exactly is a Dinosaur?



There have been around 1000 species of dinosaur described since the word “dinosaur” (which means “terrible lizard”) was coined in 1842. But what makes a dinosaur ... a dinosaur? The main way to tell is by looking at its posture.





Stand up Straight

Dinosaurs, like Stegosaurus, had an upright stance. They held their legs directly under their bodies, like mammals.

Other reptiles, such as crocodiles, have a sprawling stance and walk with their legs out to the sides. We also know, from dinosaur footprints and skeletons, that dinosaurs did not drag their tails.

Stegosaurus



Crocodile



A detailed illustration of a dinosaur family in a prehistoric landscape. A large, brown and orange striped dinosaur, likely a Tyrannosaurus Rex, stands in the foreground, looking towards the left. In the background, several smaller, similarly striped dinosaurs are visible, including a young one sitting on a large egg. The ground is dirt and rocks, with some broken eggshells in the foreground. The sky is blue with light clouds.

Egg-cellent Parents

All dinosaurs laid and hatched from eggs. These eggs came in a variety of shapes and sizes.

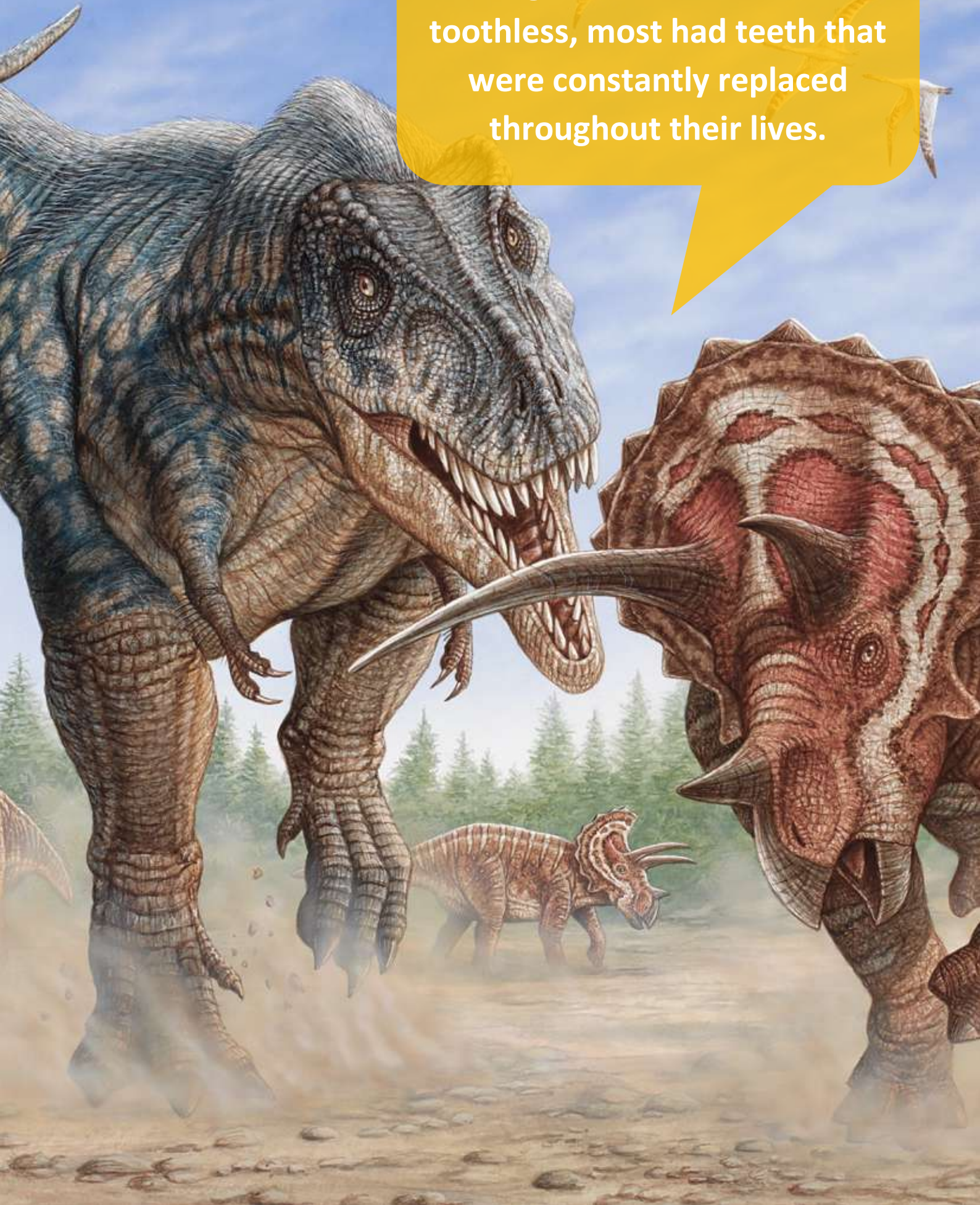
Giants like Titanosaurus had almost perfectly round eggs, while smaller dinosaurs like Oviraptor had eggs that were long and oval-shaped. The largest dinosaur eggs were over 60 cm (24 in) long!

Oviraptor Egg



Gnashers

Although a few dinosaurs were toothless, most had teeth that were constantly replaced throughout their lives.



Plant-eaters replaced teeth roughly every 56 days, while it could take T. rex up to two years.

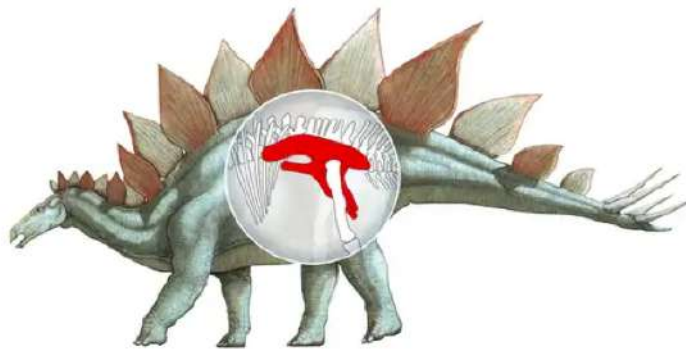
T-Rex



The Hips Don't Lie

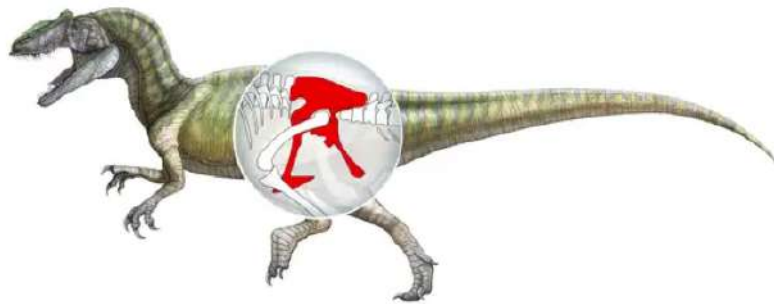
Dinosaurs can be split into two main groups – Saurischians and Ornithischians. The way to tell them apart is by looking at their hips.

Ornithischians



Hip Bone Points Backwards

Saurischians



Hip Bone Points Forwards



Dinosaurs in our Garden

Believe it or not, birds evolved from a line of dinosaurs around 150 million years ago. That means, that birds are dinosaurs! We now call the dinosaurs that went extinct 66 million years ago “non-avian dinosaurs” to distinguish from birds.

Pigeon





The Rancher's Delight



In the 1960s, a local rancher and artist named Victorino Herrera was wandering through the remote, rocky terrain of north-west Argentina when he suddenly started. There, in front of him, were bones sticking out of the rock face. Excited by his discovery, he made his way back home before contacting the famous Argentinian palaeontologists, Osvaldo Reig and Jose Bonaparte.



Together they rapidly made their way back to the site. It turned out to be a treasure trove. The team collected many fossils, including the back half of what looked like a dinosaur. Osvaldo named it *Herrerasaurus* in honour of the rancher.



A few years later, in 1988, an expedition that included Victorino's nephew, Dante Herrera found a complete skull of Herrerasaurus.

Herrerasaurus Skull



It was a game-changer, confirming that *Herrerasaurus* was one of the earliest known dinosaurs – a whopping 231 million years old!

Herrerasaurus



Herrerasaurus was a carnivore (meat-eater) that walked on two legs. It was huge, but not the biggest predator around ... That title belonged to the Saurosuchus, a crocodile-like giant that enjoyed nothing more than to snack on early dinosaurs – like our good friend, Herrerasaurus.

Saurosuchus



Rulers of the Triassic



For most of the Triassic, dinosaurs were a minor part of the ecosystem. The land was instead dominated by the survivors of the most recent extinction – animals like therapsids (some of which would evolve into mammals) and reptiles. And while some of these creatures may look like dinosaurs, none of them are!



Cynodonts were relatives of mammals that probably laid eggs but were warm-blooded and had fur.

Cynodont



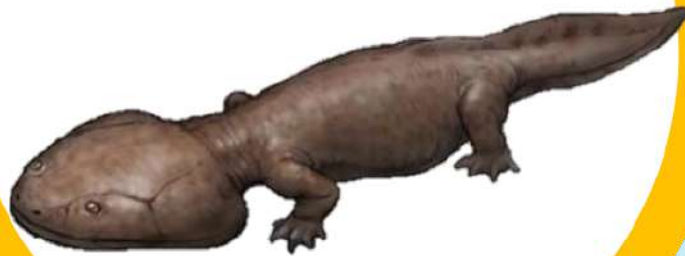
Phytosaurs were reptiles very similar to modern crocodiles, but there were some differences. Their nostrils were located near their eyes on the top of their heads and they had serrated teeth, like the edge of a steak knife.

Phytosaur



Temnospindyls were amphibians that had large flat heads that looked kind of like toilet seats. One species, Metoposaurus, was 3 m (10 ft) long.

Temnospindyls



Dicynodonts were therapsids with toothless beaks, fleshy pads on their feet and barrel-shaped bodies. Most had tusks. The largest species, Lisowicia, grew to be the size of an elephant.

Dicynodonts



Although they were more closely related to crocodiles, Rausuchians held their legs under their bodies like dinosaurs. One large species, Smok, walked on to two legs. From their fossilized poo we know they were able to chew up bone.

Rausuchians



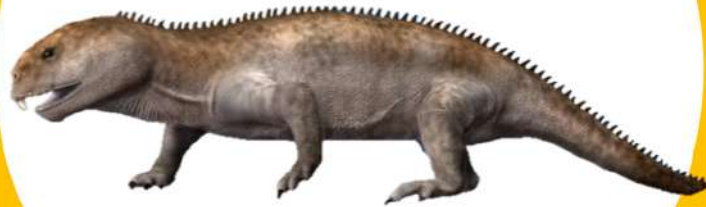
Aetosaurs were large, heavily armoured reptiles with small skulls and upturned snouts. One species, Desmatosuchus, had large shoulder spikes.

Aetosaurs



Rhynchosaurus were a group of plant-eating reptiles. Some species, like Hyperodapedon, had triangle-shaped heads and parrot-like beaks. They used their hind legs to dig.

Rhynchosaurus





THINK

DIGITAL ACADEMY

