

A World of DINOSAURS

WITH MORE THAN 60 SPECIES

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The Age of Dinosaurs

The first dinosaurs appeared around 230 million years ago. They lived over three major periods in the history of Earth: the Triassic, Jurassic and Cretaceous periods. Together, these form the Mesozoic era, often referred to as the Age of Dinosaurs.



TRIASSIC: 251-199 million years ago

The Triassic

At the beginning of the Triassic, there was one huge 'supercontinent' called Pangaea. Gradual movements within the Earth forced this to split into two continents: Laurasia and Gondwana.

The Jurassic

The continents continued to move away from each other; temperatures dropped and plant life became more lush and abundant. Dinosaurs grew bigger and began to diversify.



JURASSIC: 199-145 million years ago

The Cretaceous

The continents began to look more like their current shape. By now, dinosaurs lived right across the globe - even at the north and south pole. They grew bigger and bigger.



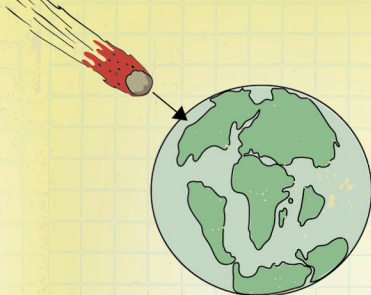
CRETACEOUS: 145-66 million years ago

Before the dinosaurs

Dinosaurs were not always dominant. Before them, and in their earliest days, a number of predatory dinosaur-like and crocodile-like groups existed, as well as some mammal-like reptiles.



Archosaurs are a group of animals including dinosaurs, crocodiles, birds and pterosaurs. Primitive archosaurs like this one walked more like crocodiles.



The meteor that struck Earth is thought to have been about 15km wide - that's about the size of Manhattan Island in New York.

Extinction

So where did the dinosaurs go? Around 66 million years ago, a meteor struck the Earth, throwing huge clouds of gas into the atmosphere. Combined with large-scale volcanic eruptions, this dramatically changed temperatures around the world. Around three-quarters of all plants and animals went extinct.



Golden eagle

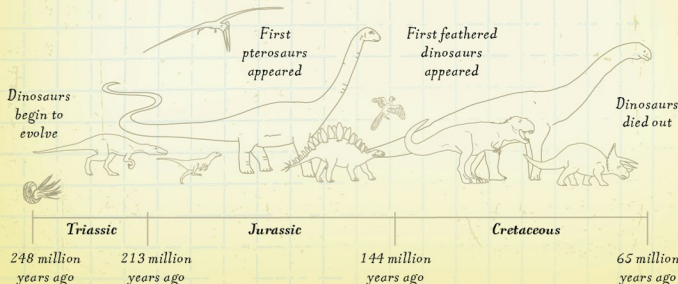
Extinct or evolved?

While many of the dinosaurs went extinct, some survived the chaos. They were a special line of dinosaurs - the birds. Able to adapt to the changing environments, they not only came out of the extinction event, but went on to flourish. Over time they evolved into the huge number of species we see around us today.

Ever seen a dinosaur?

Wait, so dinosaurs are still around today? Yes! Every bird you know, from a pigeon to an emu to a penguin, is technically a living, breathing dinosaur!

Dinosaur timeline



Dinosaurs Today

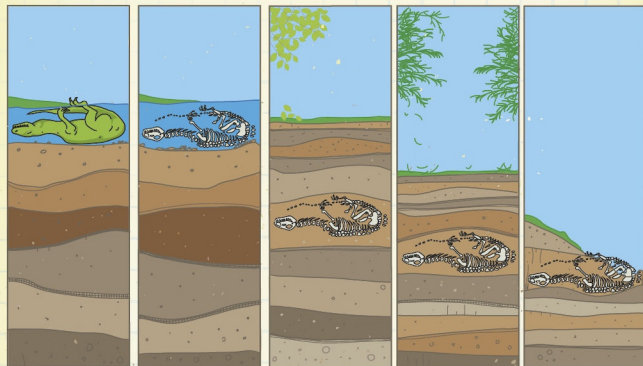
Almost everything we know about dinosaurs comes from studying their remains, known as fossils. Preserved over millions of years, fossils are usually made up of the hard part of an animal's body, such as its bones. The oldest fossils we know of are around 3.5 billion years old! They comprise the earliest forms of simple life, similar to bacteria.

What is a fossil?

The process of fossilisation takes many thousands of years to complete. It is a gradual process where the parts of an organism are slowly replaced with harder minerals, which can survive for millions of years. Scientists who study fossils are called palaeontologists.

Fantastic beasts

Before people understood what dinosaurs were, ancient cultures thought they were mythical creatures like dragons!



Often, when a dinosaur died it was washed into a lake or river. Here, its body was covered with water.

Next, its body decayed and rotted away. Usually just the skeleton remained.

Over very long periods of time, the skeleton was then covered with layers of sediment.

Over even longer periods of time, the sediment turned into rock, and the bones hardened. They transformed into fossils.

As the rocks erode away, the fossils are exposed again after millions of years. Now they can be excavated!

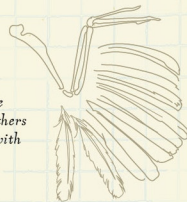
Trace fossils

Not all fossils are the preserved remains of a dead animal. Sometimes, we are lucky and find evidence of what a dinosaur was doing while it was alive. These are called trace fossils, and are useful evidence of dinosaur behaviour. Trace fossils include eggs, trackways and even fossilised faeces (poo).

Poo-ey!

Fossilised faeces are known as coprolites. They enable palaeontologists to work out what dinosaurs ate.

Sometimes the impression of feathers has been found with dinosaurs.



Fossil hunters

Researchers have also discovered fossilised wood, hair and resin (animals entombed in amber) – and even fossilised DNA. Palaeontologists are now able to examine these fossils with a range of modern high-tech scientific methods.



Most dinosaur bones are found as individual pieces, but sometimes a whole skull or even a skeleton is discovered!



A fossil ammonite – a type of mollusk that swam the ancient seas



Fossilised leaf impression



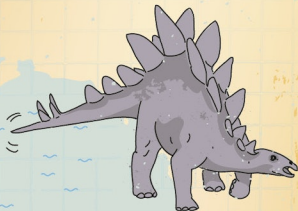
An ancient mosquito preserved in amber (fossilised tree resin)



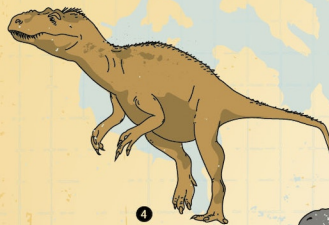
A clutch of ancient reptilian eggs



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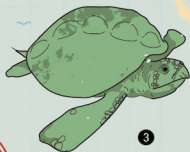
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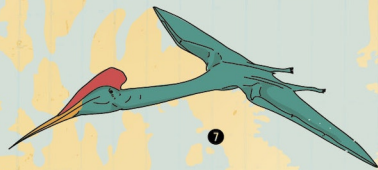
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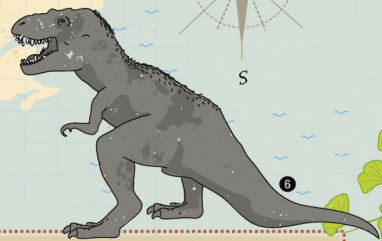
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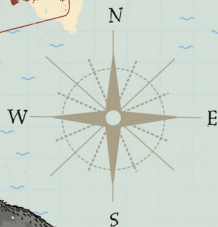
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North America

Towards the end of the Jurassic, the super continent Pangaea quickly broke up, and the Atlantic Ocean separated North America from Africa and Europe. At this time, North America had a humid, tropical climate, with many different habitats. Later on, during the Cretaceous period, a shallow inland sea covered much of the centre of North America. The divide meant that distinct types of dinosaur evolved on either side of the water.

Key

- 1 Brachiosaurus altithorax
- 2 Stegosaurus stenops
- 3 Archelon ischyros
- 4 Allosaurus fragilis
- 5 Dakotaraptor steini
- 6 Tyrannosaurus rex
- 7 Quetzalcoatlus northropi

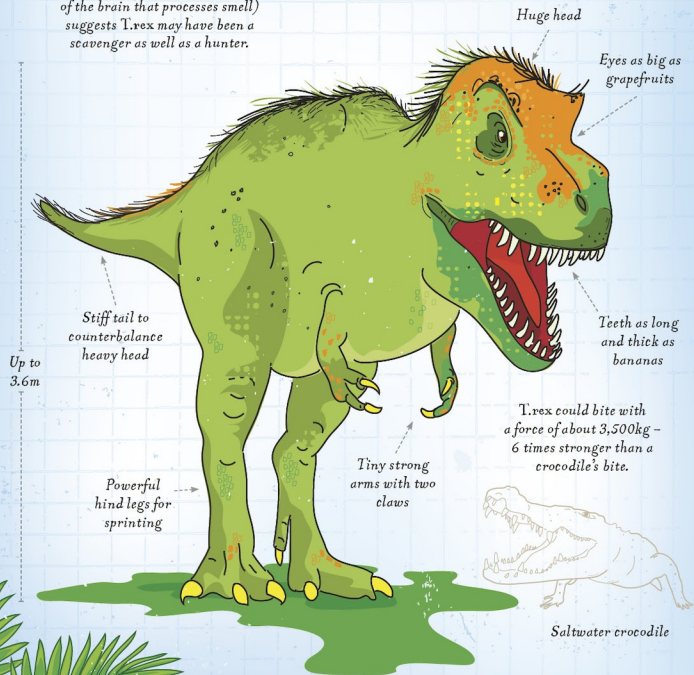


Tyrannosaurus rex

Group: Theropod • Period: Cretaceous
Pronunciation: Tie-ran-oh-saw-rus rex

Tyrannosaurus rex was perhaps the largest carnivore ever to walk the Earth. It had one of the most powerful bites of any animal, with teeth like steak knives for tearing through flesh and crushing bone. Its name, meaning 'tyrant lizard king', reflects its spot at the top of the food chain in the Cretaceous period.

A large olfactory bulb (the part of the brain that processes smell) suggests *T. rex* may have been a scavenger as well as a hunter.



Allosaurus fragilis

Group: Theropod • Period: Jurassic
Pronunciation: Al-oh-saw-rus fra-jil-is

Often termed the 'wolf of the Jurassic', *Allosaurus* was among the top predators of its time. Packs of these fearsome hunters would chase after their prey, slowly draining their target of energy before diving in for the kill. Discovered in 1877, *Allosaurus* was one of the first dinosaur fossils discovered in North America.

Slash & grab

Allosaurus probably used its sharp teeth in a 'hacking and slashing' motion, to inflict dozens of smaller wounds on larger prey.

