



PREHISTORIC BEASTS

COME FACE-TO-FACE WITH
AMAZING ANIMALS FROM THE PAST

Dr Dean Lomax • Illustrated by Mike Love

Discover
7 PREHISTORIC
ANIMALS with
POP-UP
pages

Have you ever wondered what a penguins great, great, great, great, GREAT grandparents looked like?

From tropical jungles and open oceans to polar lands, Earth is home to an amazing variety of animals. But did you know that lots of them have fascinating prehistoric secrets? By studying fossils from around the world, we can trace wild animals back to incredible beasts from the past.

ABOUT THE AUTHOR Dr Dean Lomax

Palaeontologist (scientist who studies fossils)

Being a palaeontologist is one of the coolest jobs on the planet! Unearthing new fossils is one of the most exciting parts. Using special tools, rock is carefully chipped away to reveal the bones of prehistoric animals for the first time in millions of years. Some digs contain thousands of fossils and it may take tens of years to unearth them from their ancient rocky tombs.

When I'm not digging up fossils, I'm studying them. I piece together clues to work out which prehistoric animals are related to those alive today. From studies, we know that the only living dinosaurs today are birds! But many other modern animals, from the blue whale to the elephant, have equally fascinating ancient ancestors.

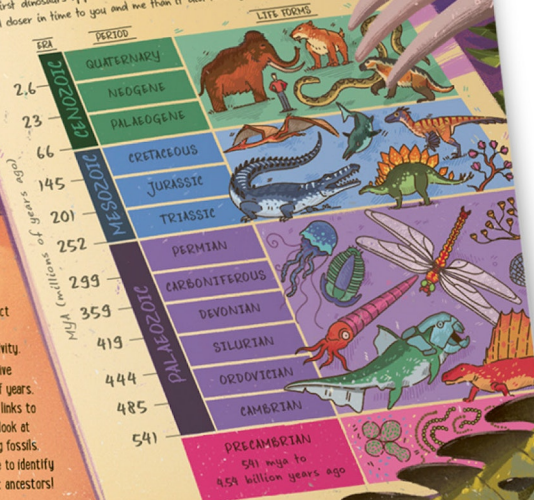
Some prehistoric animals are **ANCESTORS** of our favourite wild creatures. This means that if you traced a whales family tree back through enough generations, you'd eventually get to the oldest known whale.

Other prehistoric animals are **RELATIVES**. This means that they are closely but not directly related. Like distant cousins, they share the same ancestor at one point far back in time.

For Evelyn and Aelfred - D. L.

TIMELINE OF LIFE ON EARTH

Earth is around 4.54 billion years old! Its lifetime is split into segments called eras and periods, which show when different life forms lived. Not all prehistoric animals lived at the same time. In fact, some animals, such as the dragonfly-like Meganeura (Carboniferous Period), were actually extinct and fossilised long before the first dinosaurs appeared in the Triassic Period. Even T. rex (Cretaceous Period) lived closer in time to you and me than it did to Stegosaurus (Jurassic Period)!



Over time, living things may become extinct (die out). Today, animals are going extinct at a quicker rate than ever before because of human activity. All of the animals that are alive today evolved over millions of years, so losing them means losing links to the past. I've taken a closer look at seven wild animals and, using fossils, I've traced back through time to identify their remarkable prehistoric ancestors!

Let's meet them...

African Elephant

Meet Axel the African bush elephant. Not only do elephants have huge bodies, but they also have large ears, supersized teeth and a long nose called a trunk. Axel is a mammal belonging to the elephant family, called Elephantidae, whose earliest members appeared as much as 8 million years ago during the Miocene period.



DID YOU KNOW...
Some African elephants seek out salty rocks to eat in areas of the bush as an essential sodium.

Elephant tusk is a very long and curved tusk of the trunk. It is made of ivory and with others it can be used like a hand to pick up food and tear down from trees and to take care of water to the elephants' trunk.

Elephants use their trunk to hold up to 30 liters of water and to drink. They also use their trunk to pick up food and to tear down from trees and to take care of water to the elephants' trunk.

MAMMUTHUS

Axel's close cousin is the legendary woolly mammoth, *Mammuthus primigenius* (mam-muthus prim-i-jee-nee-uh). It was similar in body size to Axel but was covered fur! It lived across Europe, Asia and North America from at least 400,000 to just 4,000 years ago. The last woolly mammoth died almost 1,000 years after the ancient Egyptians had built the Great Pyramids of Giza!

FOSSIL FILE

MIGHTY MAMMOTHS
The skeletons and remains of thousands of mammoths have been discovered. The first skeleton to be studied in detail, complete with skin and hair, was found frozen in ice in Siberia in 1799. Paleontologists have identified ten species of mammoth. The earliest lived in South Africa 52 million years ago. Some were larger than the woolly mammoth, whereas others stood one metre tall.



Adrian's mammoth skull

250 centimetres



Woolly mammoth skulls were preserved for a long time in the cold climate of the tundra. Some of the skulls were found in the same way as the skulls of mammoths were found in Egypt and elsewhere.

A mammoth's trunk, which was used to keep its body warm in the cold climate of the tundra, was often found in the same way as the trunk of a mammoth was found in Egypt and elsewhere.

A DAY IN THE LIFE...

Woolly mammoths lived during the Ice Age, roaming vast northern grasslands called mammoth steppes. Waters were long and freezing cold. Their diet was made up of plants, including grasses, and flowers. Like elephants today, living in herds would have provided extra safety against predators, such as sabre-toothed cats and early humans. They also lived alongside another big, hairy mammal: the woolly rhinoceros.

DID YOU KNOW...
One of the greatest fossils ever discovered shows two opposite *Selenarctos mammothus* (*Mammuthus* relatives) fighting with their tusks interlocked.



SHOVEL TUSK

Platybelodon belonged to an unusual family of proboscideans nicknamed 'shovel-tuskers'. They used the flat, shovel-shaped tusks in their lower jaw to dig through and slice.



Mammuthus primigenius (mam-muthus prim-i-jee-nee-uh).

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Great White Shark

This is Brody the great white shark. At up to 6 metres in length, this shark is the largest predatory fish. Found throughout the world's oceans, Brody is a top predator and skilled hunter, armed with a jaw full of triangular razor-sharp teeth. The earliest sharks evolved more than 400 million years ago during the Paleozoic Era.

DID YOU KNOW...

Sharks smell small fish from about the equivalent of a kangaroo at about 100 kilometres from land. However, they can smell a shark from 400 kilometres per hour - as fast as a 100-metre sprinter!

Brody has many mammals, such as seals and small whales, for prey. He can eat about 2000 meals a day. He is a solitary hunter. He usually stays in the open ocean. He is a solitary hunter.

As hunting is a powerful muscle-shaped muscle. Shark fins are made of cartilage. Shark skin is made of cartilage. Shark skin is made of cartilage.

Great whites are dark on top and white underneath. This coloration is known as counter-shading and it is a form of camouflage that helps it to blend into its environment and prevent prey from spotting it.

Megalodon had a massive jaw thrust - it could easily swallow you whole! - it had the strongest bite of any animal ever known living on earth. Some estimates were powerful than a Tyrannosaurus Rex!

MEGALODON

At up to 18 metres in length, more than three times longer than Brody, this is the mighty Megalodon. This super-sized distant relative of the great white lived between 16 and 36 million years ago, ruling the world's oceans at the top of the food chain. The name 'Megalodon' comes from its scientific name, *Otodus megalodon* (oh-toe-dus meg-ah-low-don).

Like Brody, unlike Megalodon much was known up to 1930. Megalodon teeth were found with fish bones. They were found in perfect for being through teeth. Fish bones about size of teeth - so we can see which the same but also the difference!

FOSSIL FILE

BIG TOOTH

As Megalodon's skeleton was made of cartilage, are rarely found but thousands of teeth have been unearthed in places including Florida, US. Some of these teeth are known as 'Megalodon teeth'. The front row contained 24 teeth in the upper jaw and 22 teeth in the lower jaw, and side marks matching this teeth pattern have been discovered on whale bones.

CLOSE

Great white shark tooth



A DAY IN THE LIFE

Megalodon travelled far and wide, living in warm and temperate waters around the world. Due to its large size, adults mostly lived in the open ocean and probably hunted alone. Megalodon had no natural predators - except for another Megalodon and perhaps a giant toothed whale - and dined on large marine mammals such as whales, as well as smaller prey including dolphins and turtles.

PTEROSAUR DINNER

A tooth from an 85-million-year-old shark called *Cretoxyprina* was found in the neck of a Pteranodon, a flying fish-eating reptile. *Cretoxyprina* may have snatched it whilst the Pteranodon was diving underwater.

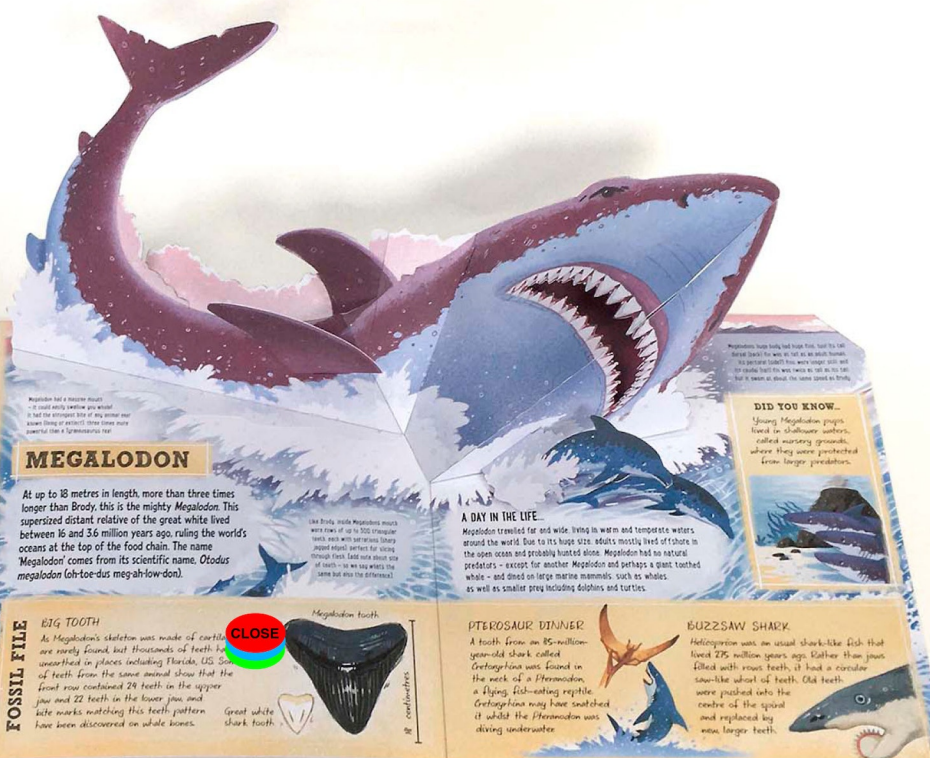
BUZZSAW SHARK

Heteroscyris was an unusual shark-like fish that lived 235 million years ago. Rather than jaws filled with rows of teeth, it had a circular saw-like whorl of teeth. Old teeth were pushed into the centre of the spiral and replaced by new, larger teeth.

Megalodon teeth had large teeth, but to tell them apart from the ones of an adult shark. As juvenile sharks, they were larger and had 10-15 rows of teeth. As they grew, they had 10-15 rows of teeth, but it wasn't at all the same as Brody.

DID YOU KNOW...

Young Megalodon pups lived in shallow waters, called nursery grounds, where they were protected from larger predators.



Dragonfly

This is Draco, the dragonfly that spends most of its life in the air. Draco has four large wings and relies on its vision to fly. It can see 360 degrees - vision to evolved more predators and to identify

Having 16 wings, 32 eyes, a central brain, and a tail that is 40 centimetres long, the four wings have independent movement and help him to hover, accelerate and even land in 100ms.

MEGANEURA

Its most ancient relatives are the extinct largest-known insects ever to have lived. It is now Central France. Early insects like *Meganeura* (pigeon-sized *Meganeura monyi*) that lived between 305 and 299 million years ago. *Meganeura* is now Central France. Early insects like *Meganeura* (pigeon-sized *Meganeura monyi*) that lived between 305 and 299 million years ago. *Meganeura* is now Central France. Early insects like *Meganeura* (pigeon-sized *Meganeura monyi*) that lived between 305 and 299 million years ago.

Meganeura was a speedster that was able to quickly shift position and change direction. It had a wingspan of at least 70 centimetres, at least seven times the width of *Draco's* wingspan.

CLOSE

ON THE LIFE...

Meganeura lived in swamps and rivers in ancient tropical forests. Hovering across the water. It would have hunted large insects, fish and even small reptiles and amphibians. Its young (nymphs) also hunted, feasting on insects, small fish, and amphibians and their eggs. Higher oxygen levels may have allowed these insects to exist.

DID YOU KNOW...

Meganeura was the largest dragonfly ever to live. It had a wingspan of 70 centimetres. It was the largest insect to ever live. It was the largest insect to ever live. It was the largest insect to ever live. It was the largest insect to ever live.

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