

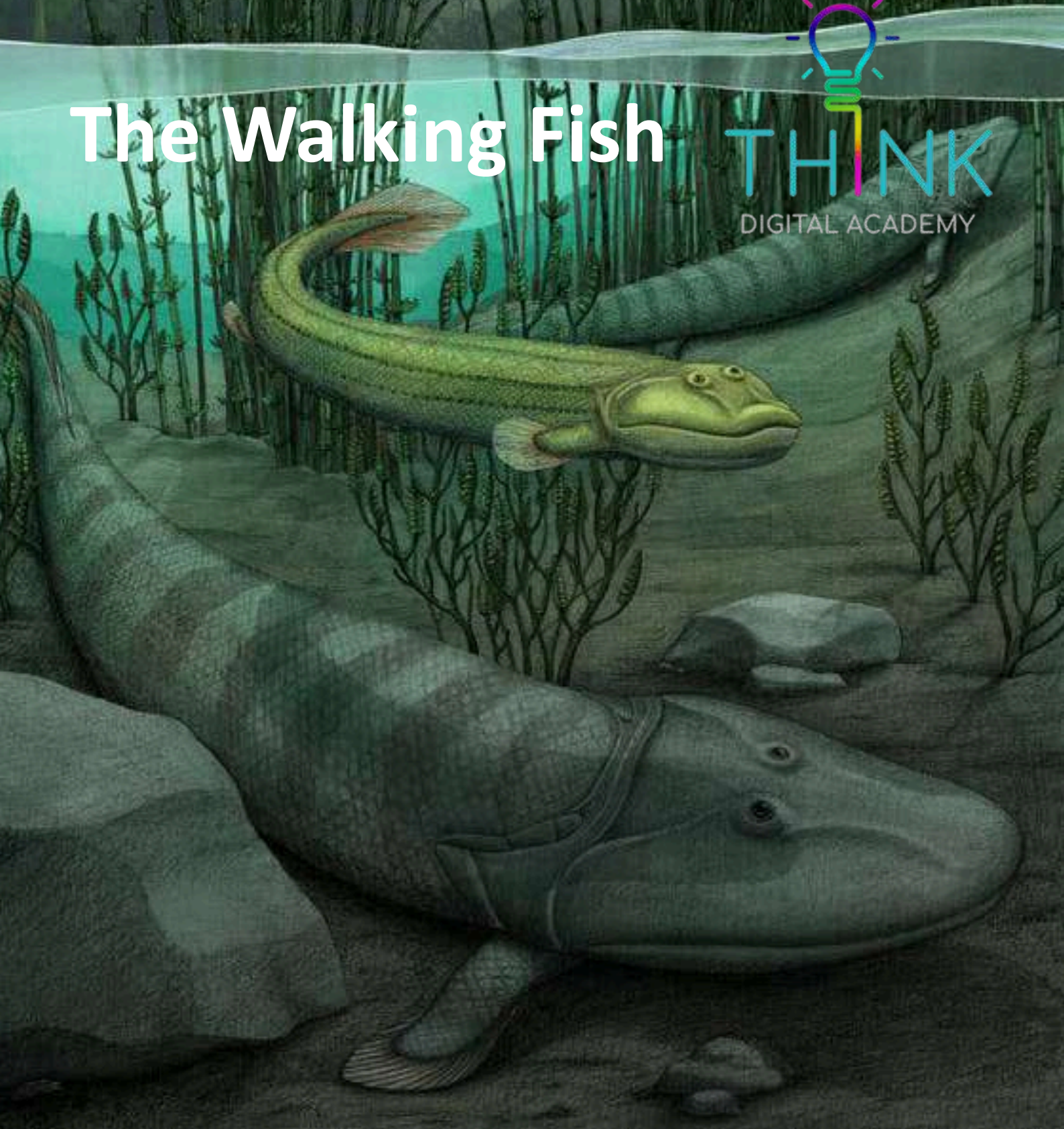


Adventures From the Land of Dinosaurs

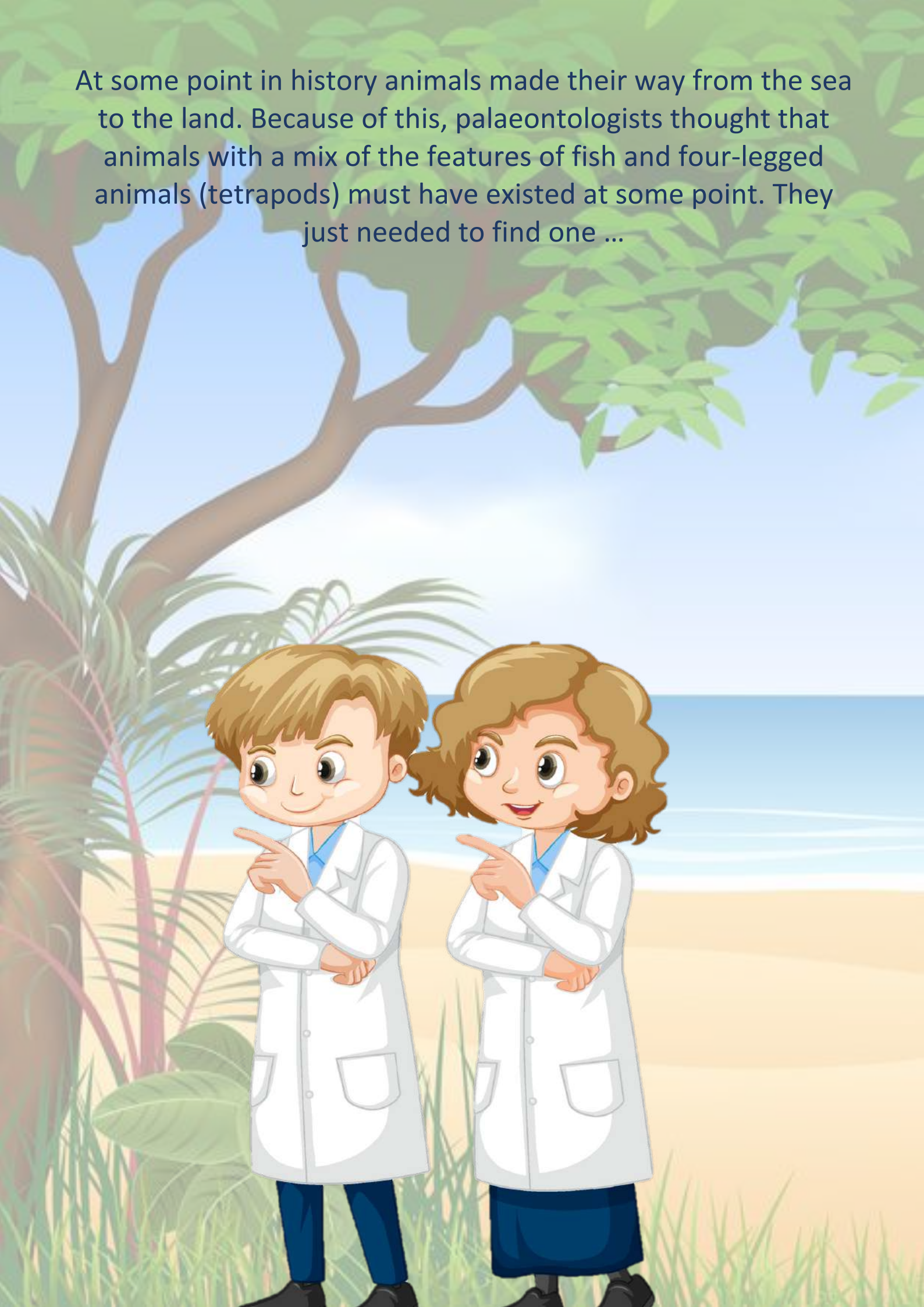
The Walking Fish



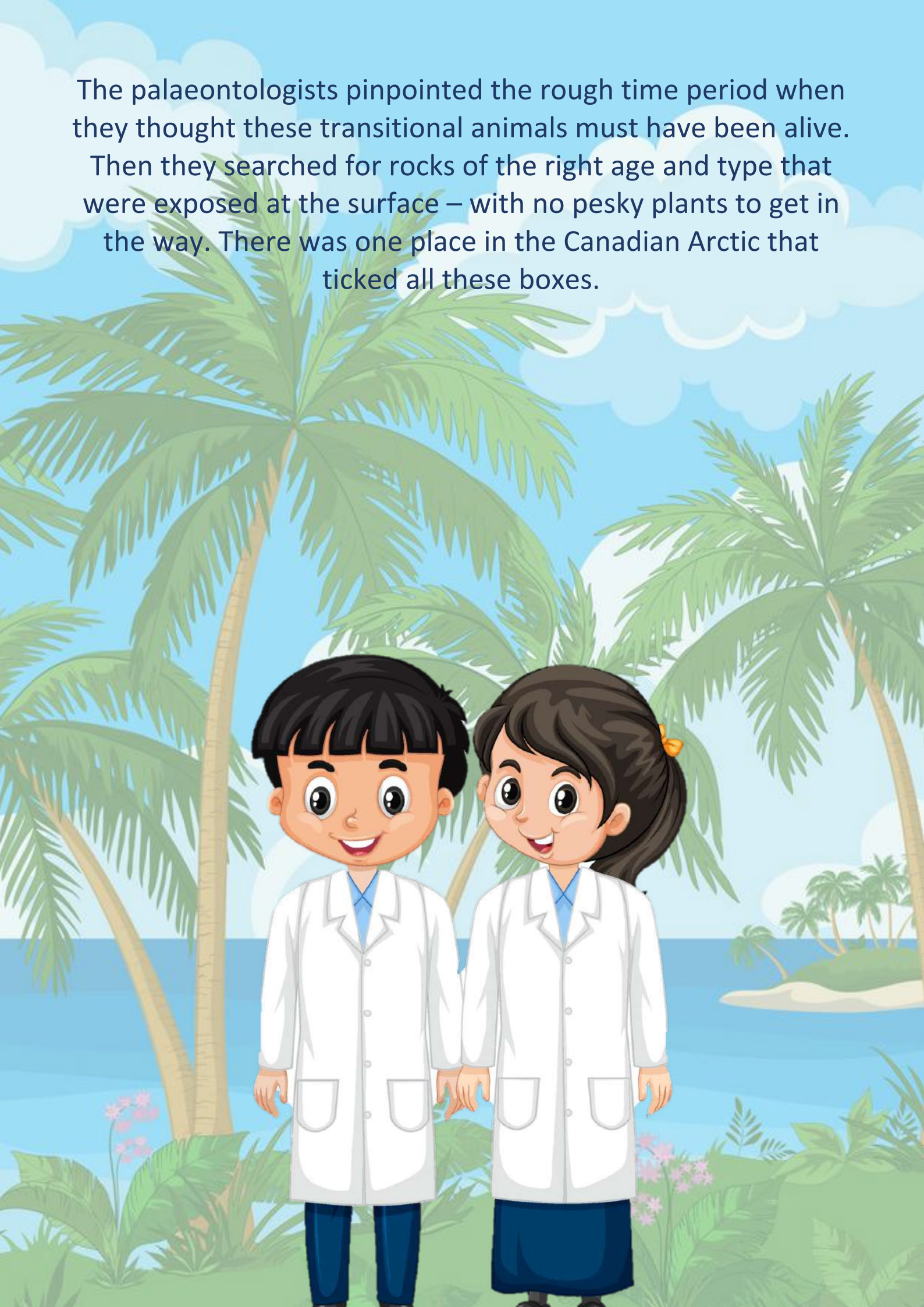
THINK
DIGITAL ACADEMY



At some point in history animals made their way from the sea to the land. Because of this, palaeontologists thought that animals with a mix of the features of fish and four-legged animals (tetrapods) must have existed at some point. They just needed to find one ...



The palaeontologists pinpointed the rough time period when they thought these transitional animals must have been alive. Then they searched for rocks of the right age and type that were exposed at the surface – with no pesky plants to get in the way. There was one place in the Canadian Arctic that ticked all these boxes.



The team, led by Dr Neil Shubin, a professor at the University of Chicago, were dropped into the wilderness by a helicopter for the first time in July 1999. They only had a small window of a few weeks before it started snowing again, but they made the most of it. As they were so far north, it helped that there were 24 hours of daylight in which they could work.

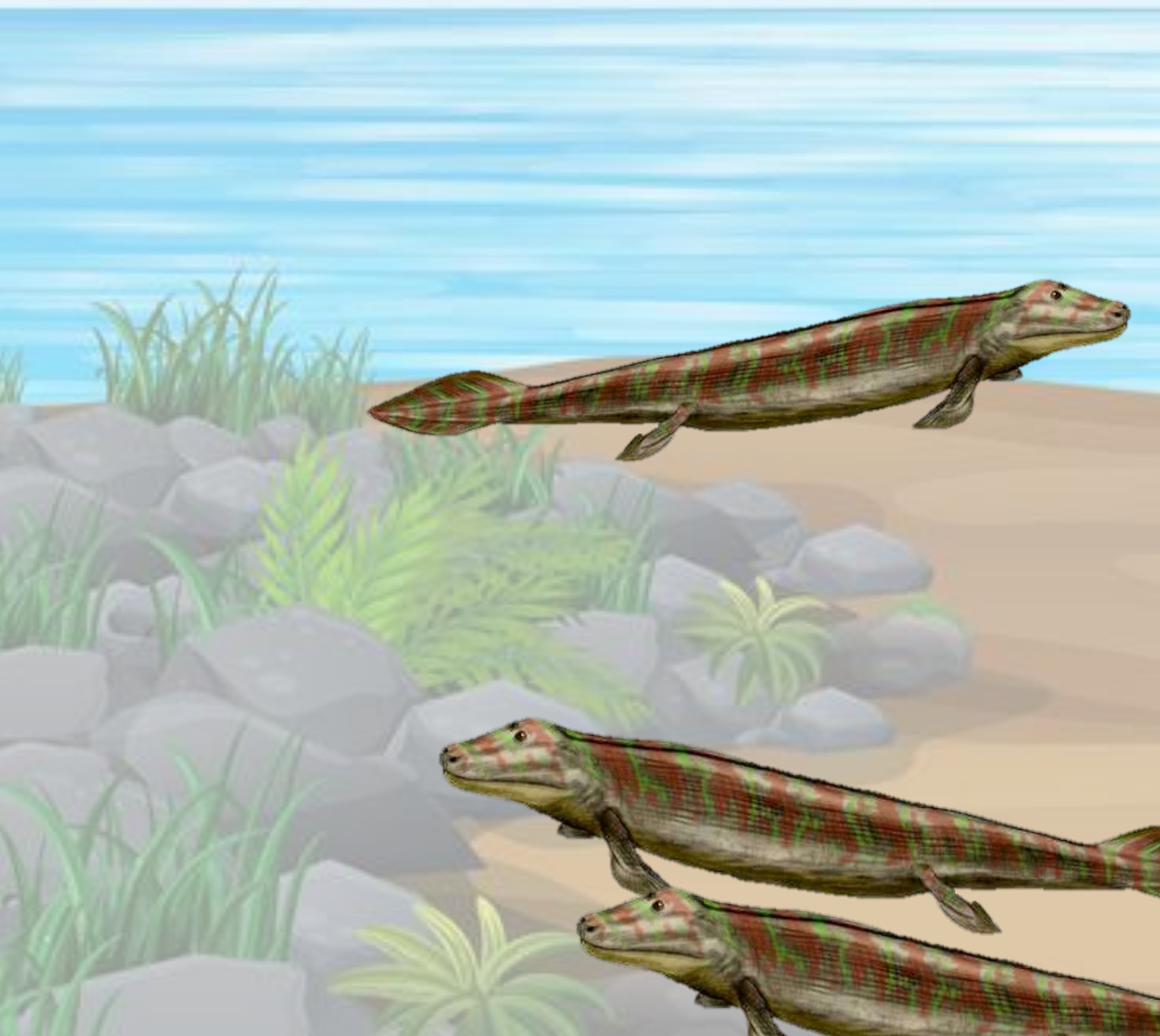


It would take searching the rocks every July until 2004 to find what they were looking for – the V-shaped tip of a snout. They encased it in a plaster jacket and took it away to be studied.

After a year and a half of preparation came the exciting moment. They had discovered an almost complete fish with tetrapod features.



Nicknamed “fishapod”, this animal had fins, scales and gills like a fish, but it also had lungs, a flat head, a neck and limb bones that looked very similar to all modern tetrapods. The local Inuit people named the fossil Tiktaalik, which in the native language means “large freshwater fish”. Since the initial discovery the team has found over 20 Tiktaalik individuals of all ages and sizes, some up to 2.7m (9 ft.) long.



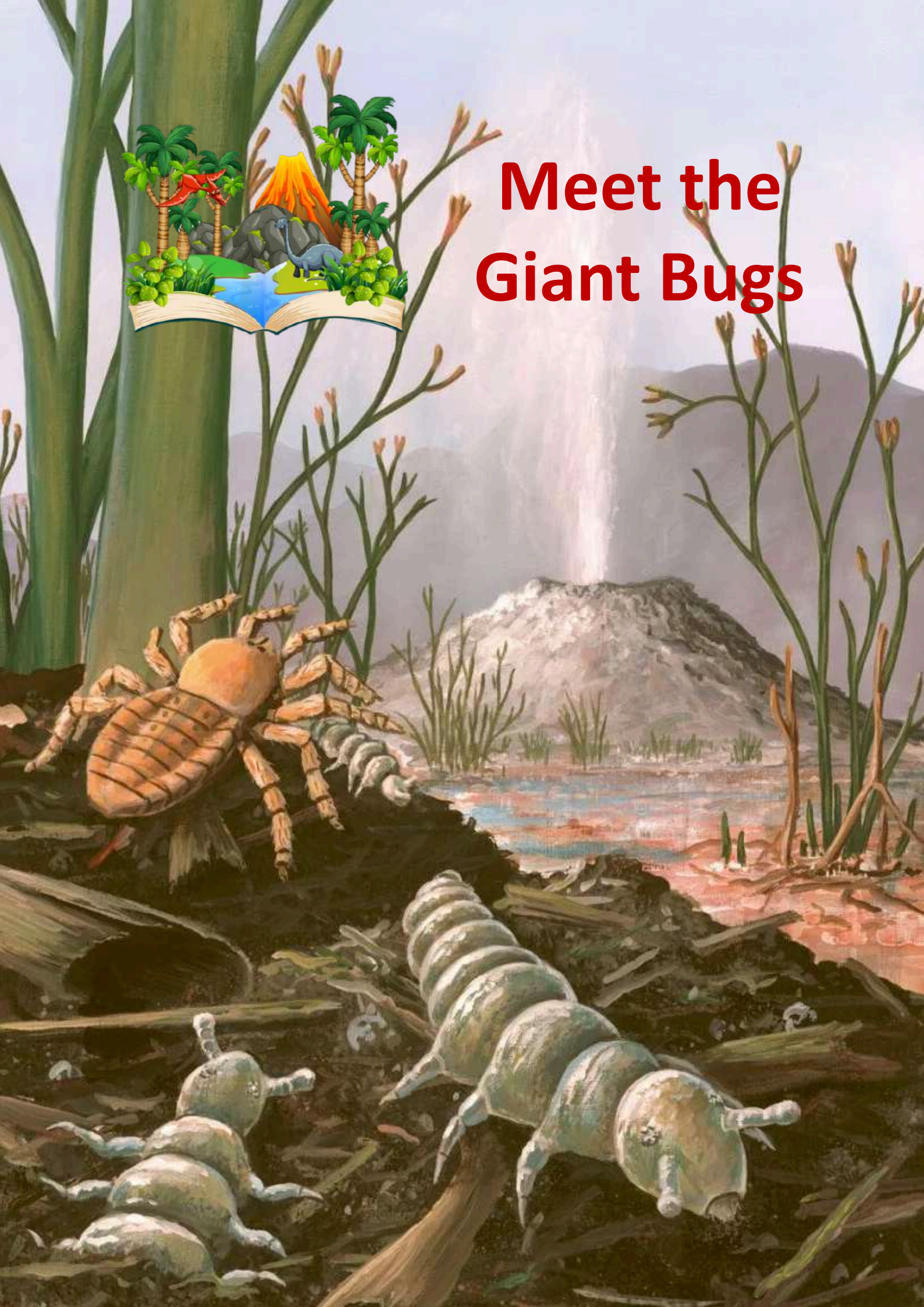
Researchers think Tiktaalik was a predator that lived in shallow water, probably a marshy swamp near the equator, around 375 million years ago. It was able to swim, could help itself up in a push-up position and may even been able to awkwardly waddle across mudflats.

Fishapod



Tiktaalik Fossil

Meet the Giant Bugs

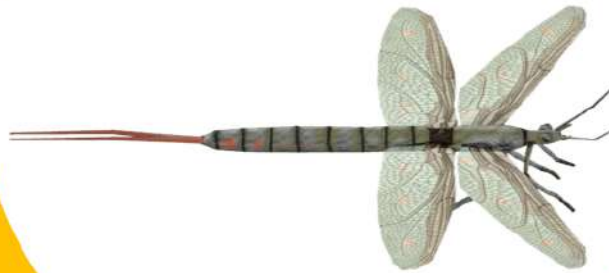


During the Carboniferous and Permian, arthropods – including insects and scorpions – reached gigantic sizes. At the time, oxygen levels in the atmosphere were around 30%, compared to 21% today. These oxygen levels allowed bugs to grow and grow. How would you feel if you came face to face with some of these critters?



Mazothairos is sometimes called the “six-winged insect” because it had a set of mini winglets in front of its first pair of wings. It also had piercing mouthparts, possibly to drink plant fluids.

Mazothairos



The **Griffinfly Meganeura** was one of the first insects with wings – making it one of the first flying creatures on earth.

Griffinfly Meganeura



The millipede **Arthropleura** was the largest land invertebrate (animal without a backbone) of all time. Scientists think it ate plant debris from the forest floor.

Arthropleura



Brodia is an arthropod that has been found in the United Kingdom and Canada. Some fossils have dark stripes preserved on the wings.

Brodia



Xenoblatta is possibly the world's largest known cockroach-like insect. The specimen was discovered in a coal mine in Ohio, USA.

Xenoblatta



Fossils of the giant scorpion **Pulmonoscorpius** were found in Scotland. Palaeontologists aren't totally sure what it ate, but they think it was carnivorous (a meat-eater).

Pulmono- scorpious



The Mystery of the Buzzshaw Shark



Around 1898, schoolchildren in Russia told their teacher about some odd spiral fossils that were found at the local rock quarry (you may have gathered by this point that quarries are great places to find fossils). The teacher passed on the information to the school inspector, Mr Bessonov, who stopped by the quarry out of curiosity.



Mr Bessonov sent the fossils to the director of the Russian Geological Survey, Alexander Karpinsky. He figured out that they were from a shark from the Permian, and were probably some kind of teeth ... but where on the shark did they go?



This mystery would last over 100 years. Then in 2013 the world finally got a clearer picture of the shark, which had been named Helicoprion, when a team from the USA scanned the spirals. Surprisingly, they found preserved cartilage from the upper and lower jaws.



This showed that the spiral sat vertically in the middle of the shark's jaw – like a circular saw blade. A student called Jesse Pruitt created a 3D model of the jaws and teeth to show how they fitted together. With this model they were able to tell what the shark liked to eat: soft-bodied prey including squid-like belemnites, and shelled creatures called ammonites.





The Family in the Burrow



The Karoo Basin in South Africa is a vast, dry area surrounded by tall mountains and high plateaus. The rocks here record a 120-million-year-long span of Earth's history, from about 300 to 180 million years ago. And to the delight of palaeontologists, they are full of fossils.



One group of rocks, known as the Beaufort, is especially fossiliferous. Over the years 30,000 vertebrate fossils have been collected (vertebrate means animals with backbones). It's one of the best places in the world to collect and study synapsids, a group of animals that includes mammals and their closest fossil relatives. Scientists are able to track the evolution of these animals through time and also learnt about their behaviour.



In 1995, Dr Roger M. H Smith, of the Iziko South African Museum was fossil hunting in a greenish-grey mudstone, a type of rock that once upon a time was mud. It was 260 million years old.

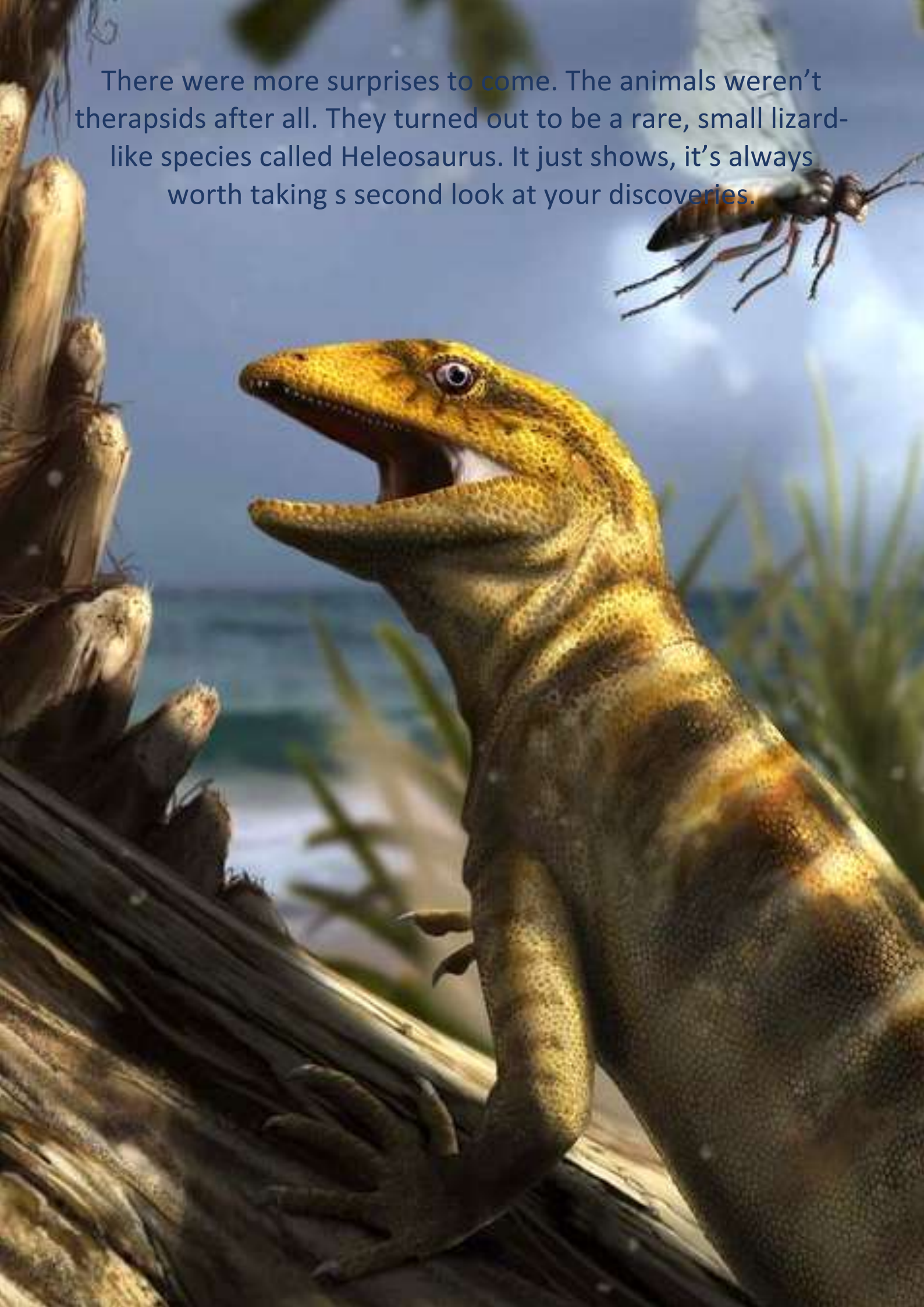
He stumbled across what he thought was the skeleton of a common type of Karoo synapsid, known as a therapsid. He didn't think much of it, so the specimen was never studied in detail.



Then, in the mid-2000s, Dr Jennifer Botha-Brink decided to take another look at the specimen. And she was in for a surprise – her team uncovered not one but five skeletons. One of the skeletons was about 50% larger than the other smaller four. Can you guess why this might have been? Jennifer had an idea – she thought that the fossils were a family group made up of a parent and four babies. It was one of the oldest examples of a land vertebrate looking after its young in the fossil record. The group might have died in a burrow, either from a surprise floor or because of a collapse.



There were more surprises to come. The animals weren't therapsids after all. They turned out to be a rare, small lizard-like species called Heleosaurus. It just shows, it's always worth taking a second look at your discoveries.





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