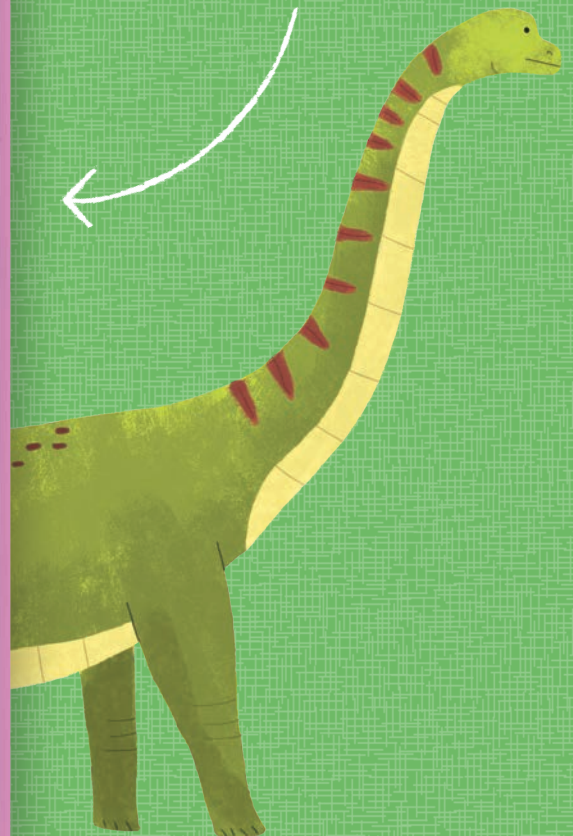


THE BIG QUESTIONS ANSWERED

TEACHERS' & PARENTS' RESOURCES

*Full of thought-provoking
questions and fascinating
extra information to
accompany this book!*



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INTRODUCTION

NOTES FOR TEACHERS, HOME EDUCATORS AND PARENTS

Inspire children's natural curiosity, improve literacy, and have fun learning about different sciences with The Big Questions Answered. Each book in the series is accompanied by a selection of fantastic, **FREE** downloadable resources.

Our **Teachers' and Parents' Resources** booklets are full of ideas for discussions, extra facts, and links to hands-on activities – all great ways to help children explore each field of science and the key topics surrounding them.

Our **Young Scientists' Activity Packs** are a real bonus. They're full of soft-learning, fun activities, all subtly linked to the field of science, that will encourage independent learning. Visit the 'Kids' Zone' to find out more.

Don't forget, on the website you can also download our **'Meet the Scientist' pages** – there's one to accompany each book – and sign up to our newsletter to follow what's coming up next for The Big Questions Answered. Download all these and more at:
www.thebigquestionsanswered.com

Is This The Biggest Dinosaur Ever? book



Young Palaeontologists' Activity Pack

KEY CURRICULUM TOPICS

The resources related to *Is This The Biggest Dinosaur Ever?* tie in with key curriculum topics including:

- Animals, including humans
- History
- Living things and their habitats
- Materials and their properties
- Rocks
- Working scientifically

The most relevant topics are indicated throughout this guide.

IS THIS THE BIGGEST DINOSAUR EVER?

This book explores the extraordinary world of palaeontology by following the discovery of the biggest dinosaur ever, the Patagotitan mayorum. As well as covering key facts from this specific discovery, the book explores the wider prehistoric world by looking at different dinosaur species, clever adaptations, and the fascinating methods scientists use to uncover the secrets of the Age of Dinosaurs.

PRE-READING QUESTIONS

Engage in discussion about the general topic of palaeontology and dinosaurs with the suggested questions below.



- How many different dinosaurs can you name?
- What's the biggest dinosaur that you can think of?
- Do you know how we know about the dinosaurs?

THE DISCOVERY OF A LIFETIME: SCENE 1

The material for this scene can be linked to curriculum topics, including: animals, including humans; everyday materials; living things and their habitats; rocks.

Jump into the initial find that led to one of the biggest dinosaur discoveries ever! Engage in discussion about dinosaurs, bones and fossils, and the types of locations where they're found.



DISCUSSION PROMPTS

- What is a bone?

Information overleaf

- What do you think the bone will look like when it's revealed?

Encourage children to write down their answers. The bone is revealed in the second scene of the main book, and they'll then be able to see if they were right!

- What is it like in the desert? Can you name any animals that live in the desert?

Information overleaf

- How do you think the shepherd felt when he spotted this bone in the ground?

Give examples of emotions such as feeling shocked, scared, excited, and so on.

ACTIVITY

Corresponding activity on page 3 of the activity pack: 'Diary Entry' is a creative writing activity which encourages children to imagine they found a fossil, like the shepherd, and describe it in a diary entry.

THE DISCOVERY OF A LIFETIME: SCENE 1

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

BONES AND FOSSILS

Bones are hard **tissues** that connect with **muscles** and **joints** to hold a body together.

Most animals have their **skeleton** on the inside of their body. This is called an **endoskeleton**. Examples of animals with endoskeletons include humans, fish, cows, and orangutans.

Some animals have their skeleton on the outside of their body! This is called an **exoskeleton**. Examples of animals with exoskeletons include crabs, grasshoppers, and beetles.

DESERTS

Deserts are very dry places that get less than 25 cm (10 inches) of rainfall every year. Deserts can be boiling hot, for example the Sahara desert in Africa, or freezing cold, for example the Antarctic desert in Antarctica.

It is difficult for animals and plants to live in the desert because there is so little water. All plants and animals on Earth need water to **survive**. Those that live in the desert have to **adapt** - change themselves - to survive.

Examples of animals that live in hot deserts include camels, roadrunners, meerkats, tarantulas, ostriches, scorpions, and snakes.

Examples of plants that live in hot deserts include cacti (plural of cactus), tumbleweed, and elephant trees.

Deserts are examples of **habitats**. Some examples of other habitats include the rainforest, forest, swamp, and Arctic tundra.

FOSSIL DETECTIVES: SCENE 2

The material for this scene can be linked to curriculum topics, including: animals, including humans; everyday materials; rocks.

Discover the gigantic bone in all its record-breaking glory. Engage in discussion about dinosaurs, bones and fossils by examining the revealed bone, and engage curiosity by considering how bones are uncovered.



DISCUSSION PROMPTS

- **What does the bone look like now? What words can you use to describe it?**
Encourage children to use a range of adjectives to describe the bone, including describing the colour, size, texture, and so on.
- **How close were you to being right?**
Encourage children to compare their expectations with the answer.
- **What tools do you think the scientists used to dig out the bone?**
Encourage children to write down their answers. The process is revealed in the fourth scene of the main book, and they'll then be able to see if they were right!

ACTIVITY

Corresponding activity on page 4 of the activity pack: 'Fossil Hunt' is a task where children match up the dinosaur with its skeleton! With handy hints, this is a fun activity that reinforces how fossilised bones were once inside living dinosaurs.

FOSSIL DETECTIVES: SCENE 2

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

DINOSAUR BONES

The dinosaurs haven't been around for **millions** of years! They **died out** about 66 million years ago.

The only reason we know about dinosaurs is because **palaeontologists** have found **fossils** of their **bones**, **footprints**, and even their poop! From these **remains**, scientists have found clever ways of learning all about the animals that they came from.

Fossils are very **rare** and they are usually **buried** really deep underground! Scientists think they will never find all the fossils hidden across the world.

Fossils are very **fragile** and palaeontologists have to be extremely careful when digging them out of the ground. They don't want to **damage** them!

PALAEONTOLOGY

Palaeontology is a **branch of science**. It takes lots of training to become a palaeontologist, and these scientists usually **specialise**. This means they choose what they want to spend most of their time looking at.

Some choose to study **ancient** animals like dinosaurs, some choose to study ancient plants, and some choose to study tiny fossils that are so small they can only be seen with a **microscope**!

Palaeontologists usually spend some time digging up bones, and some time **examining** them in a lab using clever machines and equipment. It's an exciting job that's like being a science detective!

A HERD OF DINOSAURS: SCENE 3

The material for this scene can be linked to curriculum topics, including: animals, including humans; living things and their habitats.

Uncover the impressive scale of a titanosaur herd! Engage in discussion about these gigantic creatures and how they lived within their prehistoric world.



DISCUSSION PROMPTS

- Can you spot the different dinosaur hiding on this page of the book?
 - Why do you think this different dinosaur is hiding?
Information overleaf
- Do these dinosaurs remind you of any animals that we have on Earth today? If so, why do they remind you of these animals?
Encourage children to talk about features such as neck shape and length, leg shape, horns and claws, and so on.

ACTIVITY

Corresponding activity on pages 5-6 of the activity pack: 'Dino Bodies' is an activity where children have to label the dinosaur with the corresponding body part. Multiple dinosaur sheets have been provided.

A HERD OF DINOSAURS: SCENE 3

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

DINOSAUR GROUPS

Scientists **divide** dinosaurs up into different groups to show which other dinosaurs they are most like or share **features** with. There are lots of different groups...

Examples of dinosaur groups include **theropods** (includes Tyrannosaurus rex and Velociraptor); **sauropods** (includes Diplodocus and Brachiosaurus); and **ornithopods** (includes Iguanodon and Hypsilophodon).

DINOSAURS SPECIES

Big groups of dinosaurs are divided into even smaller groups called **species**. These groups are much more specific.

Examples of dinosaur species include Tyrannosaurus rex, Tyrannotitan, and Diplodocus.

It's not just dinosaurs that are divided into species. Examples of other animal species include lion, tiger, and leopard.

Dinosaur species are usually named after a **characteristic** body feature, the place they were found, or a person involved in the discovery.

For example, Triceratops was named after its horns. Its name means "three-horned face"!

PREDATORS AND PREY

In the **animal kingdom**, some animals are **predators** and some are **prey**. This is all to do with what animals eat!

In this scene of the book, did you spot Tyrannotitan, a fierce predator, hiding in the bushes? It is trying to sneak up on its prey!

Predators hunt, fight, and eat other animals. Examples of dinosaur predators included Tyrannotitan, T.rex, and Allosaurus. Examples of modern-day predators include tigers, polar bears, and sharks.

Prey are the animals that are hunted and eaten by the predators! Examples of dinosaur prey included small lizards, fish, and other dinosaurs! Examples of modern-day prey include rabbits, mice, and fish.

DIG, DIG, DIG: SCENE 4

The material for this scene can be linked to curriculum topics, including: rocks; working scientifically.

Discover the process of fossil excavation, from the tools that palaeontologists use to the impressive scale of a dig. Engage in discussion about uncovering fossils and the detective work that palaeontologists do.



DISCUSSION PROMPTS

- What tools can you see the scientists using?

Encourage children to compare their expectations with the answer.

- Why do you think they use different tools when digging out fossils?

Information overleaf

- How many fossils do you think the palaeontologists found?

This answer is revealed in the fifth scene of the main book, and they'll then be able to see if they were right!

ACTIVITY

Corresponding activity on page 7 of the activity pack: 'Fantastic Fossils' is a classic activity where children fill in the blanks in a series of sentences and facts about fossils, dinosaurs, and digging palaeontologists!

DIG, DIG, DIG: SCENE 4

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

TOOLS

Palaeontologists use lots of different **tools** to help them uncover **fossils**. Fossils are **fragile**, but they are also usually **buried** under thick layers of rock which makes digging them out really tricky.

Sometimes palaeontologists use big, powerful **machinery** like diggers and jackhammers for breaking through rocks, but they must be very careful as these strong tools can damage fragile fossils!

Most of the time they use small, **handheld tools** like chisels and brushes to carefully uncover fossils. These may be slower, but they are much more gentle and safer to use.

Once the fossils have been revealed, they are carefully **transported** to the palaeontologist's **lab** where they use incredible machines and equipment to learn all about the animals that the fossils came from.

THE CHALLENGES OF A DIG

Palaeontologist digs can go on for months and months, and sometimes years! The scientists must be patient and make sure they have found all the fossils in the area.

It can be a **stressful** job for lots of reasons: the fossils can be easily **damaged**; the machinery is **dangerous** to use; being outside, palaeontologists have to work through different weather conditions, including desert heat, freezing cold or wet weather.

Working well as a team is very important for all kinds of scientists, but it's especially important for palaeontologists working at a dig site.

IN THE LAB: SCENE 5

The material for this scene can be linked to curriculum topics, including: animals, including humans; rocks; working scientifically.

Uncover the detective work that scientists undergo when examining fossils. Engage in discussion about what can be learnt from fossils and introduce the setting and tools that are needed to uncover fossil secrets.



DISCUSSION PROMPTS

- Why do you think the scientists took the fossils to the lab rather than stay in the desert?
- What can you tell about the lab from the picture? What useful things can you spot?
Encourage children to point out tools like the microscope, brushes, notebooks and features like cleanliness, lighting, and so on.
- If you were one of the palaeontologists in this lab, what's the first thing you would want to find out about the dinosaur?
 - Do you think dinosaurs still exist?
Information overleaf

ACTIVITY

Corresponding activity on page 8 of the activity pack: 'When Did Dinosaurs Live?' is a cut and stick activity where children match up the dinosaur with the period it lived in. A fun way to show they didn't all live at the same time!

IN THE LAB: SCENE 5

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

WHEN DID DINOSAURS LIVE?

Dinosaurs lived **millions** of years ago, but they didn't all live at the same time...

TRIASSIC PERIOD - 252-201 MILLION YEARS AGO

Dinosaurs appeared about 245 million years ago when the world was very hot and dry, and lots of land was **desert**. The first dinosaurs were much smaller than ones that came later. The first dinosaurs included Eoraptor, Coelophysis, and Plateosaurus.

JURASSIC PERIOD - 201-145 MILLION YEARS AGO

During this period, the weather became wetter, allowing **forests** and new **plants** to grow. Plant-eating dinosaurs grew bigger, and so did hungry meat-eaters! Dinosaurs in the Jurassic period included Allosaurus, Diplodocus, and Stegosaurus.

CRETACEOUS PERIOD - 145-66 MILLION YEARS AGO

Some of the most famous dinosaurs lived in the Cretaceous period, including T.rex, Triceratops, and Spinosaurus. Lots of other creatures were also around, like the now-**extinct reptile** Mosasaurus. This was the last dinosaur period, and it ended very dramatically indeed...

WHERE ARE THEY NOW?

Scientists think that dinosaurs died out about 66 million years ago. There have been **debates** about the reason, but most scientists believe that a gigantic **asteroid** crashed into Earth which caused most of the animals on Earth at the time – including dinosaurs – to become extinct.

AGEING FOSSILS: SCENE 6

The material for this scene can be linked to curriculum topics, including: animals, including humans; living things and their habitats.

Explore how a single fossil can tell us how many millions of years ago the dinosaur lived! Engage in discussion about the dinosaurs that were around at the same time as the titanosaur, Patagotitan mayorum, and the different diets that dinosaurs had.



DISCUSSION PROMPTS

- Can you name any of the dinosaurs in this scene?

From left to right: T. rex (dark red), Titanosaur (green in distance), Velociraptor (orange), Triceratops (grey), Ankylosaurus (dark brown), Pterodactyls (flying), Titanosaur (green & beige).

- What do you think each dinosaur would eat for dinner?

Information overleaf

- What dinosaur do you think is the scariest? Why do you think this dinosaur is the scariest?

Encourage children to talk about features such as teeth, horns, spikes, and so on.

ACTIVITY

Corresponding activity on page 9 of the activity pack: 'Dino Dinners' is a fill in the blanks activity where children are given a series of sentences about dinosaurs, what they ate, and how we know about it, and they have to select the correct missing word!

AGEING FOSSILS: SCENE 6

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

WHAT DID DINOSAURS EAT FOR DINNER?

Just like us, dinosaurs didn't all eat the same things; they all had different **diets**.

Fossils give palaeontologists lots of information about what dinosaurs ate. They look at the shape of the teeth and the markings on them, as well as fossilised **remains** from inside the dinosaurs' bellies. Sometimes they even find bite marks in bones. They can match up the marks with specific teeth to see who was trying to eat who!

CARNIVORES

Some of the most famous dinosaurs, like T.rex and Velociraptor, were **carnivores** – they **hunted** and ate other animals! They had sharp **teeth**, **jaws**, and **claws** for catching and eating **prey**. Some other examples include Allosaurus and Giganotosaurus.

HERBIVORES

Palaeontologists think most dinosaurs were **herbivores** – they only ate plants. Many, like **sauropods**, grew very long necks to help them eat from the tops of trees. Some other examples include Triceratops and Stegosaurus.

OMNIVORES

Some dinosaurs ate meat AND plants! These animals are called **omnivores**. Dinosaurs that could eat both types of food could **survive** in lots of different places because they could always find something to eat. Some examples include Oviraptor and Troodon.

DISCIVORES

Animals that mostly eat fish (but also meat) are called **piscivores**. Scientists only know of a few piscivore dinosaurs, including Spinosaurus and Baryonyx. They had long, **narrow snouts** and curved claws to help them catch fish.

THE FOOD CHAIN

Scientists draw food chains to show what animals eat. For example, plants were eaten by Triceratops which was eaten by T.rex! This shows scientists how things in nature **interact**. They don't just do this for dinosaurs, but modern-day plants and animals, too!

AN EGG-CELLENT DISCOVERY: SCENE 7

The material for this scene can be linked to curriculum topics, including: animals, including humans; living things and their habitats.

Explore how even tiny fossil finds can have a huge impact on our understanding of dinosaurs. Engage in discussion about how special and rare fossils are and how we're constantly learning more from them.



DISCUSSION PROMPTS

- What do you think dinosaur skin would feel like? Can you compare it with another animal that we have on Earth today?

Encourage children to use adjectives to refer to texture like 'smooth/rough', 'scaly/spiky', and so on.

- What do you think palaeontologists can learn about by looking at dinosaur eggs?

Information overleaf

- Can you think of any other animals that we have on Earth today that lay eggs?

Information overleaf

ACTIVITY

Corresponding activity on page 10 of the activity pack: 'Help the Dinosaur Family' is a maze activity where children have to help the baby dinosaur find its way back to its parent.

AN EGG-CELLENT DISCOVERY: SCENE 7

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

ANIMAL LIFE CYCLES

All animals go through a **life cycle**: they are **born**, they grow, they have babies, and they die. Life cycles of some animals are much longer than others, and can look very different from each other.

One big difference in animal life cycles is the way that animals give birth to their babies: some lay **eggs** and some give birth to **live young**.

LAYING EGGS

Animals that lay eggs have to **protect** the egg until it has **hatched**. This is because the baby animal inside the egg is very tiny and not ready to live outside the egg yet. It grows inside the egg until it's big enough and ready to live outside the egg, then it hatches!

Examples of animals that lay eggs include insects, birds, fish, **amphibians** (like frogs) and **reptiles** (like snakes and lizards).

Dinosaurs are another example of reptiles. Scientists have found many **fossils** of dinosaur eggs which showed how these animals lived and had babies! They have also found huge areas covered with egg fossils which suggest that some dinosaur **herds** laid their eggs close together, protecting them in big groups and finding safety in numbers.

LIVE YOUNG

Animals that give birth to live babies are called **mammals**. This huge group of animals grow their babies inside their tummies. Once the baby is big enough and ready to live outside the tummy, it is born! The amount of time this takes is very different depending on the animal - some take less than a month, and some take almost 2 years!

Examples of mammals include humans, dogs, horses, and elephants.

BUILDING A FULL-SIZE SKELETON: SCENE 8

The material for this scene can be linked to curriculum topics, including: animals, including humans; working scientifically.

Explore how scientists create a full-size replica of the dinosaur's skeleton from its fossilised bones. Engage in discussion about the clever methods that are used and the reasons for doing so.



DISCUSSION PROMPTS

- Why do you think the palaeontologists are building a full-size replica of the dinosaur? What do you think they will do with it?
- Which part of this process do you think will be the hardest? Why?

ACTIVITY

Corresponding activity on pages 11-12 of the activity pack: 'New Dino Discovery' is a series of creative drawing activities where children create their own dino skeleton! After, they can draw what their dinosaur would have looked like alive, with skin and muscles!

BUILDING A FULL-SIZE SKELETON: SCENE 8

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

TYPES OF SKELETONS

Skeletons are the framework of **bones** that hold an animal's body together.

Most animals have an **endoskeleton**. This means that their **skeleton** is on the inside of their body, surrounded by their muscles and skin. Examples of animals with endoskeletons include humans, dogs, horses, and sharks.

Some animals have an **exoskeleton** instead. This is when an animal's skeleton is on the outside of their body! This type of skeleton protects the animal's internal organs. Many animals that have an exoskeleton are **invertebrates**; they don't have a backbone! Examples of animals with exoskeletons include crabs, shrimp, ants, and scorpions.

The skeleton that the scientists are building in the book is an endoskeleton.

TEAMWORK IN SCIENCE

Working well as a team is very important for all kinds of scientists, but it's especially important for palaeontologists who work on projects, like the one in this book, that can take months or years to finish!

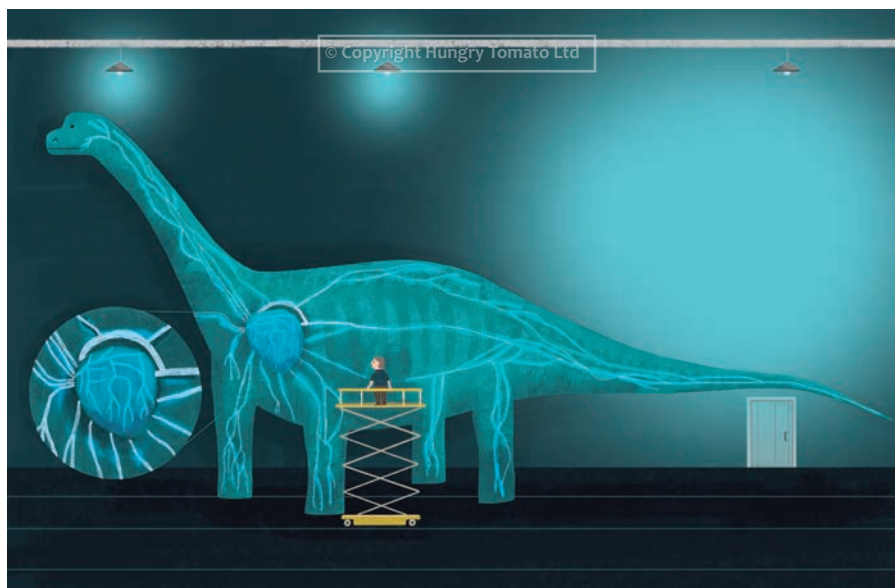
It's not just getting on with other palaeontologists either; they have to work with lots of different scientists! Different **branches** of science cross over all the time, for example palaeontology and geology (the study of the Earth and all it's made of).

When creating huge **replica** skeletons, like the one in the book, palaeontologists may need help from other specialists like **engineers**. Projects like this couldn't happen without lots of different people coming together to put in hard work.

DINOSAUR X-RAY: SCENE 9

The material for this scene can be linked to curriculum topics, including: animals, including humans; living things and their habitats.

Discover the ginormous size of the titanosaur's body and its impressive features that kept it alive. Engage in discussion about the fact that all animals have different features that help them survive.



DISCUSSION PROMPTS

- From the picture, can you point out which part is the dinosaur's heart?
- We know that this dinosaur's body had special features that kept it alive. Can you think of any animals alive today that have special features of their own?
Encourage children to talk about features like teeth, claws, and camouflage fur/skin and abilities like good eyesight, and so on.
- Can you think of any other animals that are nearly as big as this dinosaur?

ACTIVITY

Corresponding activity on page 13 of the activity pack: 'Dinosaur Adventure' is a classic word search activity, using lots of great dinosaur words to get children familiar with the language of palaeontology.

DINOSAUR X-RAY: SCENE 9

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

BODY PARTS

All animals are **unique**, but many have similar parts that make up their bodies. For example, head, mouth, eyes, legs, and so on.

Some body parts can be seen from looking at the animal and some are hidden under the **skin**. For example, you can see an animal's head which is on top of its body, but you usually can't see its ribs because they're under the skin.

To see what's under an animal's skin, scientists use special machines called **x-ray machines**. These machines **scan** the body and show the scientists what's inside, including the **bones**, **tissues**, and **organs** that make up the body!

DINOSAUR BODY PARTS

Looking at dinosaurs is a bit different from animals that are alive today! Usually only bones become **fossils**, so scientists have to use what they know about animals that are alive today to work out how big the dinosaur's **muscles** and organs were, and how they fitted together.

Creating **computer models** and **3D models** with this information can help scientists get an idea of how the dinosaur's body worked.

MODERN EQUIPMENT

Modern-day palaeontologists use lots of computers and different **technology** to help them do their jobs.

- Super strong **microscopes** allow them to study the tiniest fossils.
- X-ray machines and **CT scanners** allow them to see inside fossils.
- Computer programmes help **reconstruct** skeletons and visualise dinosaurs' bodies and their movements.
- Clever tools allow them to look at **DNA** and learn more about the dinosaurs.

LONG, LONG NECKS: SCENE 10

The material for this scene can be linked to curriculum topics, including: animals, including humans; living things and their habitats.

Compare prehistoric times with modern day with this side-by-side scene in the book. Engage in discussion about the similarities and differences between the time periods, from animals and plants to landscapes.



DISCUSSION PROMPTS

- What similarities and differences can you notice between the titanosaur and the giraffe?

Encourage children to point out similarities such as long necks, eating plants, head shape, and differences such as leg size and shape, skin patterns, and so on.

- Titanosaurs had very long necks. Can you think of any other dinosaurs with special features?

Information overleaf

- What's different about the landscape in each scene?

Encourage children to notice features such as different types of trees, grass, weather, and so on.

ACTIVITY

Corresponding activity on pages 14-15 of the activity pack: 'Cool Dinosaur Features' is a fun challenge for children to work out which key dinosaur feature is missing and draw it onto the image of the dinosaur provided.

LONG, LONG NECKS: SCENE 10

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

COOL DINOSAUR FEATURES

The Patagotitan mayorum was able to **survive** thanks to its very long neck. It wasn't the only dinosaur that had special features. Here's some other great and unusual examples:

BONY PLATES AND SPIKES

Some dinosaurs' bodies were covered with thick, bony **plates** and **spikes**. An example of this is Ankylosaurus. This smart dinosaur also had a solid chunk of bone at the end of its tail. These things probably helped the dinosaur **protect** itself from any animals that tried to attack it.

HORNS

Triceratops had three huge **horns** on its head! These would have made great **weapons** for fighting off attacking **predators**. Fossils show that Triceratops' horns could **heal** themselves if bitten off, which would have been very useful!

HEAD CREST

This unusual feature would make any dinosaur stand out from the crowd. Parasaurolophus had a big head **crest** that connected to its nose! Palaeontologists think that it could blow air through the crest to make a loud sound, maybe to **warn** others about nearby **danger**!

FEATHERS

Palaeontologists used to think that all dinosaurs were **scaly**, but they now know some had **feathers**! For example, tiny Microraptor had long feathers on all four of its arms and legs. Palaeontologists think it may have been able to **glide** from tree to tree, but they argue about whether the dinosaur would have been able to fly in the way that birds do today.

TEETH

Most dinosaurs relied on their teeth for eating, but they could also come in handy when fighting other animals. The biggest tooth ever found belonged to a T.rex. It was an impressive 30 centimetres (12 inches) from root to tip!

FIGHT FOR SURVIVAL: SCENE 11

The material for this scene can be linked to curriculum topics, including: animals, including humans; living things and their habitats.

Explore how fossils teach us about much more than just what dinosaurs looked like, from what they ate to whether they were predator or prey!
Engage in discussion about how dinosaurs lived and interacted.



DISCUSSION PROMPTS

- Why do you think these dinosaurs are fighting?
Information overleaf
- Who do you think would win the fight between these two dinosaurs? Why?
Encourage children to talk about physical features such as teeth, claws, jaws, and so on.
- Which of these two dinosaurs do you think would be the fastest runner? Why?
Do you think this helped them stay alive?
- Can you think of any animals we have on Earth today that have teeth like the Tyrannosaurus (pictured left in the scene)?

ACTIVITY

Corresponding activity on page 16 of the activity pack: 'Fighting Dinosaurs' is a crossword activity where children use clues to name the different body parts dinosaurs used to fight for survival! They can then fill in the crossword with the answers.

FIGHT FOR SURVIVAL: SCENE 11

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

THE FOOD CHAIN

Scientists draw food chains to show what animals eat. For example, plants were eaten by Triceratops which was eaten by T.rex! This shows scientists how things in nature **interact**. They don't just do this for dinosaurs, but modern-day plants and animals, too!

Fossils give palaeontologists lots of information about what dinosaurs ate. They look at the shape of the teeth and the markings on them, as well as **fossilised remains** from inside the dinosaurs' bellies. Sometimes they even find bite marks in bones. They can match up the marks with specific teeth to see who was trying to eat who!

Some dinosaurs had to fight off bigger ones that might try to eat them, just like the titanosaur is doing in this scene with the tyrannotitan!

SURVIVAL TECHNIQUES

In the **animal kingdom**, only the fittest, strongest or cleverest **survive**! Both in our modern-day world and back in the **prehistoric** times of the dinosaurs, animals must find clever ways to survive. When an animal changes its behaviour or part of its body, scientists call that change an **adaptation**.

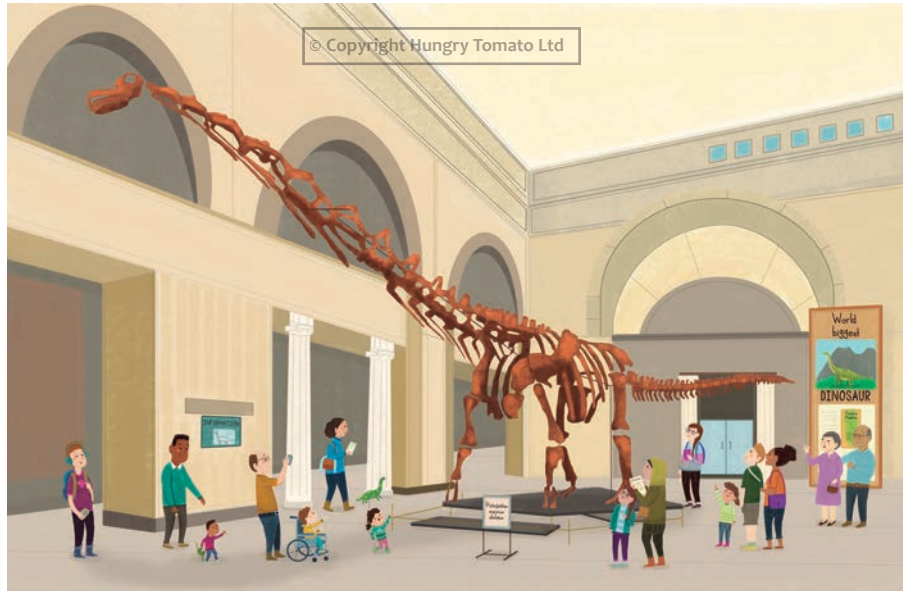
Some survival techniques include:

- **Herds** - animals can stay safer from **predators** when sticking together in a group.
- **Camouflage** - animals whose skin colour blends in with their surroundings find it easier to hide from predators, or to sneak up on their **prey**!
- Growing big **teeth** or **claws** - animals with big and strong body parts are more likely to win when fighting other animals.
- **Venom** - animals that can create venom that harms others are more likely to survive.
- **Nocturnal** - animals that sleep in the day and wake up at night find it easier to hide from predators, or to sneak up on their prey! This also helps them control their temperature if they live somewhere that's extremely hot during the day.

THE BIG REVEAL: SCENE 12

The material for this scene can be linked to curriculum topics, including: animals, including humans; history; working scientifically.

Observe the full-size replica of the titanosaur, *Patagotitan mayorum*, on its museum podium. Engage in discussion about dinosaur skeletons and the importance of being able to view them in museums.



DISCUSSION PROMPTS

- Have you ever seen a giant dinosaur skeleton at the museum?
If so, what was it like?
- What do you think these people viewing the skeleton are thinking and feeling?
Give the children examples of emotions such as feeling shocked, scared, excited, and so on.
- Do you think museums are important? Why or why not?

ACTIVITY

Corresponding activity on page 17 of the activity pack: 'Incredible Dinosaur Facts' is a mixture of research and creativity. Children choose a dinosaur, research it, fill in the fact file, and draw it. Activity can be printed multiple times to generate a fact booklet!

THE BIG REVEAL: SCENE 12

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

BIGGEST DINOSAURS EVER

Patagotitan mayorum is the biggest, most **complete** dinosaur found to date, but there are some other **contenders** that almost got the top spot!

ARGENTINOSAURUS

Argentinosaurus is one of the largest land animals that ever lived! Its **fossils** are huge, but because scientists have only found a few it's very difficult to work out the dinosaur's exact size. They think that Argentinosaurus was shorter than Patagotitan, but heavier.

PUERTASAURUS

Only four Puertasaurus bones have ever been discovered, all of which are gigantic **vertebrae**: it had a very wide rib cage. Until more fossils are found, there's no way of telling just how big this dinosaur really was.

SAUROPOSEIDON

When the first Sauroposeidon fossils were found, palaeontologists thought they were tree trunks! This dinosaur had one of the longest necks of all **prehistoric** creatures.

WHO WINS?

Some scientists have argued about the size of the Patagotitan mayorum since it was announced as the biggest ever. However, since they have more fossils to work off, they're more confident in these numbers compared with other huge dinosaurs.

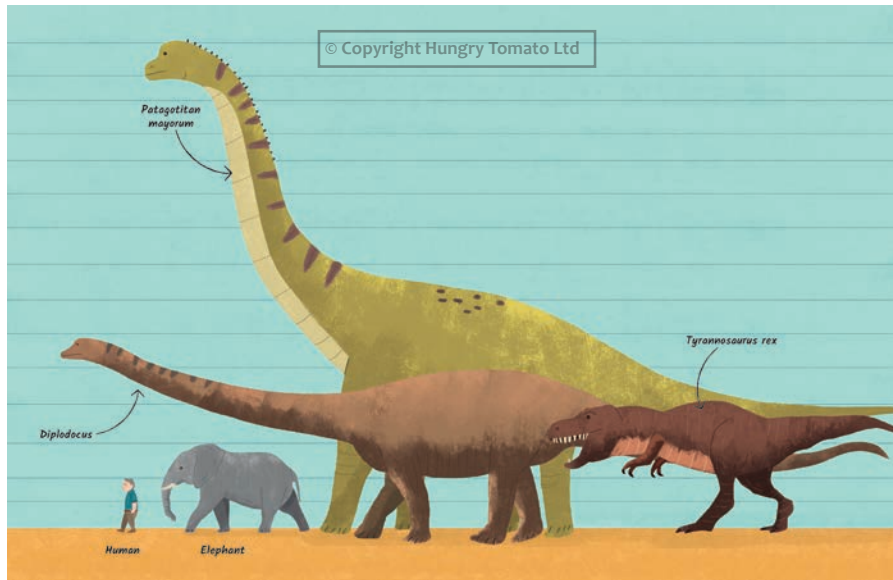
MEASURING SIZE

Working out the size of dinosaurs is tricky - palaeontologists don't always have a full **skeleton** to look at! They have some clever ways of working out size, including comparing single bone measurements with complete skeletons of other dinosaurs or animals that still **exist** today.

THE BIGGEST OF ALL: SCENE 13

The material for this scene can be linked to curriculum topics, including: animals, including humans; living things and their habitats.

Compare the size of the titanosaur, Patagotitan mayorum, against other impressive animals from the prehistoric and modern-day worlds. Engage in discussion about different types of animals and their unique features.



DISCUSSION PROMPTS

- Why do you think animals are different shapes and sizes?
- What makes dinosaurs different from animals that we have on Earth today?
 - What's the tallest animal you can think of that still lives today?
Information overleaf
- Which of these animals would you most like to meet if you could?
Which would you least like to meet? Why did you pick those animals?

ACTIVITY

Corresponding activity on page 18 of the activity pack: 'The Discovery' is a true or false quiz. Children use what they have learnt from reading the main book, as well as their intuition, to fill in the answers.

THE BIGGEST OF ALL: SCENE 13

RELEVANT INFORMATION

Keywords that you may want to pull out and explain have been put into bold.

BIGGEST IN THE WORLD

The Patagotitan mayorum may be the overall biggest dinosaur ever found, but there's lots of other impressive animals in the world that have broken different records!

Examples include:

- The biggest animal today is the blue whale.
- The biggest land animal today (by weight) is the African elephant.
- The tallest land animal today is the giraffe.

These records would probably be very different if dinosaurs were still alive today!

WHERE DO ANIMAL SPECIES GO?

Scientists know that not all the dinosaurs lived at once. Some lived and died out long before others **existed**, but why does this happen?

When a **species** dies out and no more of those animals exist, we say that the species has become **extinct**.

There are lots of reasons why a species might become extinct. For example, illness and **disease**, **pollution**, loss of **habitat**, and loss of **food sources**.

It's not just animals that become extinct - plants can too!

PROTECTING SPECIES

There are millions of different plant and animal species on Earth today, but lots are facing extinction.

We can all help protect species through the things that we do.

For example, you can help by looking after natural areas and putting litter in the correct bins, learning about the **endangered** species in your area, not harming plants or animals, **recycling**, turn the tap off when brushing your teeth to cut down how much water you use, and much more!

POST-READING QUESTIONS

Engage in discussion about the journey taken throughout the book and the facts that were uncovered, with the suggested questions below.

- Were you surprised to learn that the Patagotitan mayorum was the biggest dinosaur ever?
- Did anything else in the book surprise you?
- What's the coolest thing you've learnt from this book?
- Do you have a favourite dinosaur?

ACTIVITY

Corresponding activity on page 19 of the activity pack: 'Write Your Own Palaeontology Story' is a creative writing activity which encourages children to write a story about palaeontology, using three key prompt words.

THE BIG QUESTIONS ANSWERED

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