

Mission to the Mesozoic

“Ok class, now remember, before we get off the bus, let’s talk about what we’re going to see today.” As Ms. Akley talked about exhibits on dinosaurs, Kiana, Violet, and Kabir bounced in their seats. They couldn’t wait to get off the bus and start exploring the museum.

Kiana, Violet, and Kabir had been best friends since first grade. Their favorite day of the year was field trip day to the museum.

“And remember! Stay with the group!” said Ms. Akley. As Kabir, Violet, and Kiana were walking down a hallway with the rest of the class, Kabir suddenly stopped. A door they had walked past many times before, was open.

Kabir stepped toward the door and peeked inside. “C’mon Kabir, we gotta keep walking. The rest of the class is leaving.” said Violet. Ms. Akley was getting further and further away and Violet was worried that they’d get in trouble once Ms. Akley saw that they weren’t with the rest of the class.

But Kabir wasn’t moving, he had stopped outside of a plain door that was partially propped open.

“Whoa! What is this place?” whispered Kabir. Kiana ran over and peeked over Kabir’s shoulder. “Whoa! Violet, come look at this!” she said.

Violet looked inside the open door and into a big room with really tall ceilings. In the middle of the room was a huge glass dome. Three adults were in the room, and they stood in a small circle looking down at something.

“I don’t know, Dr. Who. It just doesn’t seem to want to work for us this morning.” Suddenly, she looked up and saw Kiana, Kabir, and Violet standing at the open door.

“Uh oh!” said Kiana “We’d better go.” “Wait!” said the woman. “Maybe you can help us.”

“Us?” asked Kabir.

“Yes!” said the woman.

“But, who are you?” asked Kiana.

“Oh! I’m **Dr. Field**,” said the woman “and this is **Dr. Who** and **Dr. When**” she said pointing at the other two women in the room.

“We are scientists, and we study Earth’s ancient past. Our knowledge-o-meter suddenly stopped working, and we’re stumped. Can you help us figure out what is wrong with it?”

“What’s a knowledge-o-meter?” asked Kiana.

“Oh! A knowledge-o-meter is powered by knowledge! We enter everything we know about Earth’s past into the knowledge-o-meter and it shows us what Earth would have looked like millions of years ago.”

“So it is a time travel device?” asked Kabir.

“Nope! We can’t go back in time” said Dr. Field. “The knowledge-o-meter just takes what we’ve learned about Earth from the fossil record, and shows us images of what the plants and animals would have looked like during that time period!”

“What’s the fossil record?” asked Violet.

“The fossil record is like a library of the life on Earth. A fossil is an imprint or remains of a plant or animal in rock. The fossil record helps us see what plants and animals lived in the past, and it helps us understand how Earth has changed over time” said Dr. Who.

“That’s pretty cool.” said Kiana. “Can we go inside one of the domes and see what it looks like?”

“Yes! But first we need to figure out why the knowledge-o-meter isn’t working. Can you help us?” asked Dr. Who.

Kiana, Kabir, and Violet all looked at the knowledge-o-meter and started investigating the problem.

“HmMMM” said Kiana. “It looks like the storage is full. You have a lot of photographs on here. Can we delete some of them?”

“Yes!” said Dr. When. “ If that is what it takes to get the knowledge-o-meter working again.”

“Ok, done!” said Kiana. “Now can we see what the knowledge-o-meter does?”

“Absolutely!” said Dr. Field. Dr. Who, When, and I will feed it the knowledge we have about Earth’s past and it will project what the earth looked like then.”

“Can we all go in together?” asked Violet. “Yeah!” said Kabir and Kiana at the same time.

“Ok” said Dr. Field, opening the door to the first glass dome. “Get ready, you are about to see what the world looked like during the Late Triassic period, which began 237 million years ago. And remember, you are going to see all kinds of animals and plants, but don’t be scared, none of the animals can hurt you in the knowledge-o-meter”

“So it is kinda like we are watching a movie of the past? Kinda like those documentary films that my dad likes to watch?” asked Violet.

“Exactly. But we’re watching a movie about a period of time loooooong before humans existed. Millions and millions of years before any human walked on Earth.” said Dr. Field.

“Cooooo!” said Kabir. “Let’s go!”

Kiana, Kabir, Violet, and Dr. Field step into the glass dome, and all around them a world comes to life.

“Where ARE we?” asked Kiana.

“Welcome to Texas, 237 million years ago.” said Dr. Field.

“It definitely feels hot!” said Kiana.

“The climate in the Late Triassic is extreme, with really hot summers and really cold winters. During this period, there were only two continents. Earth is recovering from one of the largest extinction events ever where 90% of all living things died.” said Dr. Field.

“Whoa! If 90% of everything died, what survived?” asked Kabir.

“Let’s explore and see what we find.” said Dr. Field.

The kids look around and begin to notice all of the living things in this dry landscape. A small green **reptile** naps on a log. A pack of blue two legged dinosaurs called Coelophysis run toward a Plateosaurus climbing a tree and eating leaves. The long necked plateosaurus is an **herbivore** and eats only plants unlike the **carnivores** chasing it. The blue **predators** try to jump and attack the long-necked dinosaur **prey**, but they aren’t tall enough to reach.

Kabir and Violet can’t stop watching the dinosaurs, but Kiana’s eyes wander and she notices something in the sky.

“Look at that bird!” Kiana exclaimed.

“That’s a weird looking bird.” said Violet.

“I don’t think that’s a bird at all!” Kabir said as the animal landed on the ground in front of them. “Look at how it’s sitting now. It has fingers where its wings fold. It looks sort of like a bat!”

“So it’s a prehistoric bat? But it has a beak and that weird hanging skin under its neck.” said Kiana.

“Ohhh! That is the Caeliestiventus, a type of **pterosaur**. Pterosaurs were flying reptiles and the only flying animals besides insects that were alive in the Triassic!” said Dr. Field.

“Are they dinosaurs?” asked Kiana. “It looks like it has scales like a dinosaur.”

“While **dinosaurs** and **pterosaurs** were both **reptiles**, they were two separate groups an only distantly related from very early ancestors” said Dr. Field.

“Whoa! Look at that group of hippos in the river over there,” Kabir said while excitedly pointing towards the river.

“There are even baby hippos!” screeched Violet “They are sooooo cute!”

“What a great observation!” Dr. Field exclaimed. “Those are a group of synapsids called placerias. While they behaved like hippos, mammals weren’t actually alive yet. Synapsids like placerias were ‘mammal-like’ reptiles and would later give rise to mammals millions of years later.”

Suddenly the group of placerias fades away. The group begins to panic!

“Ahhhh!”

“Where did they go!?”

“Look! The other animals are disappearing too!” cried Kiana, Kabir, and Violet.

“You are watching the end Triassic extinction” said Dr. Field.

“Extinction?” said Kiana. “Like what happened to the dinosaurs?”

Kabir’s head drooped. “Doesn’t extinction mean that an animal is gone forever?”

Dr. Field nodded her head. “You are right. Extinction does mean that an animal or plant is gone forever. The end Triassic extinction is the fourth mass extinction the Earth experienced. The extinction lasted millions of years and nearly 80% of all living things were lost.”

“Wait!” Violet. “If things keep going extinct, how do we have any animals and plants at all?”

“And I thought Earth was recovering from an extinction event in the last time period?” said Kabir.

“You are both right” said Dr. Field. “The Earth has gone through many extinction events, including the one that killed all of the dinosaurs. But Earth can recover from extinction events.”

“You mean, like we heal when we are hurt?” asked Kabir.

“Similar to that! While many animals and plants die out during an extinction, there are a few that survive. The descendants of those survivors change, become more diverse, and fill in the gaps that other living things leave. It takes millions of years to do but life finds a way,” said Dr. Field.

The images of the end Triassic began to fade, and the glass dome becomes a murky gray color.

“What’s happening?” asked Kiana.

“We’re moving into another time period.” said Dr. Field “In just a minute we’ll see images from the Jurassic.”

As the bubble slowly becomes clear, a new environment begins to fade into view. Lush jungles appear, and water droplets collect on the dome.

“It feels humid in here.” said Kabir.

“And hot!” added Kiana.

“Welcome to the Jurassic, which began 201 million years ago.” said Dr. Field.

“What part of the world are in we in now?” asked Violet.

“We’re still in Texas, but it sure does look and feel a lot different from before, doesn’t it? That’s because the continents have started to separate, so inland seas are starting to form. Those inland seas are making the climate very warm and humid” said Dr. Field.

“It is so green!” said Violet “But where are all the flowers?”

“We’re a little bit too soon for flowers, they won’t evolve for millions of years. In the Jurassic, plants like ferns, conifers and ginkgo trees are dominant. We call these types of plants **gymnosperms.**” said Dr. Field.

“A gym-no-what??” asked Kabir.

“GYM-NO-SPERMS, basically a plant that protects its seeds in a sturdy cone or on the underside of a leaf” said Dr. Field.

Kiana starts to point out a bird flying in the sky, but a gargantuan pair of legs steps slowly into their field of vision.

“Watch out!” said Kabir

Kabir, Kiana, and Violet look up at an enormous dinosaur snacking on the greenery.

“Whaaaaat is THAT?!” whispered Violet as she shrinks to the back of the bubble.

“Not to worry!” Dr. Field said. “That is our good friend the *Brachiosaurus*. She is a sauropod; one of the largest plant eaters to ever exist. Sauropods were everywhere during the Jurassic. Their size protected them from all sorts of predators.”

A tiny furry animal scurries under the sauropod’s feet and dives into a tree trunk.

“A rat! A rat just ran by!” said Kabir.

“Were rats even alive in the Jurassic? I don’t think I’ve even seen any other mammals?” said Kiana.

“Great observation! Mammals first appeared in the Jurassic. That small furry animal you just saw is a very early mammal called an *Alphadon*. Their size helped them to survive too. Being so small helped them to hide from larger predators” said Dr. Field.

Slowly the lush jungle of the Jurassic disappeared and the glass dome became gray and murky again.

“Where are we going now?” asked Kiana.

“And what happened? We didn’t see the animals and plants fade away like we did the last time,” asked Violet.

“We’re off to the Cretaceous! And the reason you didn’t see anything fade was because there wasn’t an extinction event between the Jurassic and the Cretaceous.” said Dr. Field.

“It feels different here” said Violet.

“It does! Did the continents shift again?” said Kabir.

“You’ve got it!” said Dr Field. “The continents are now very close to how they look today. They’ll always be moving, but it takes a very long time for them to move.”

Once again the group looks around at the scene in front of them. There are lush plants surrounding them, and a huge variety of dinosaurs roam everywhere.

“Hey, I think I remember seeing that plant in the Jurassic. Maybe in the Triassic too? And it kinda looks like a plant that grows in my Grandma’s backyard.” said Kiana.

“Yep, you are looking at a fern. You are right that we’ve seen ferns in every single period we’ve visited.” said Dr. Field. “The fern in your Grandma’s backyard isn’t exactly the same as the ones that were around during the Mesozoic Era, but it is a relative of the ferns who lived in the time of dinosaurs.”

The sound of heavy footsteps rocks the glass dome and an enormous *T. rex* looms over a *Triceratops* munching on some greenery.

“Ahhhhhh! I think that *T. rex* is going to eat that other dinosaur. She’s running right at him!” screamed Kiana.

“Holy cow!” yelled Kabir “That other dinosaur has spikes all over it! Won’t they stab *T. rex* in the mouth?!”

“That is a good observation. Those spikes on the *Ankylosaurus* help protect it from predators like the *T. rex*.” said Dr. Field.

The *T. rex* tries to bite the *Ankylosaurus* but bites down hard on its spikes. It makes a loud screeching sound and backs away.

A white bird swoops low in the sky.

“It looks just like a seagull!” said Violet.

“But with teeth! That bird is definitely not a vegetarian!” replied Kabir.

Once again the animals begin to disappear, but this time it’s the dinosaurs that are leaving. The sky gets very dark and it’s hard to see the sun.

“Is this the extinction that killed the dinosaurs? This is when the asteroid hit Earth and all the dinosaurs died right then right!?”

“While you are right about the asteroid everything didn’t die immediately. The impact caused huge volcanic eruptions which spewed ash into the sky. This ash completely covered the sun.”

“But if there wasn’t any sun how did the plants survive?” asked Violet

“Many of them didn’t,” Dr. Field replied, “and when there aren’t enough plants to eat, the herbivores have no food so they died too.”

“And if there weren’t any herbivores then the carnivores wouldn’t have had food either!” exclaimed Kabir.

Kiana said, “you told us about two other extinction events, if they didn’t happen from an asteroid hitting, what caused them?”

“That is a good question. Earth goes through changes over time. Remember how the Triassic felt hot and dry and the Jurassic felt humid and lush and green? Those differences were caused by the movement of continents. Extinction events happen because of the changes that Earth goes through. Some things are able to persist through time. Ferns have existed for hundreds of millions of years, while flowering plants have been around a much shorter amount of time. Birds are technically the direct ancestors of dinosaurs! Earth continues to change, and we need to take care of our planet. Talk about this amazing experience, talk to your friends about how cool Earth is and how we need to take care of it.” Dr. Field explained.

“Cool! Can’t wait to get back to the bus and tell EVERYONE!”

“Thanks for all of your help!” Dr. Field said while smiling.

“Let’s go everyone!”