

Be an Exhibition Explorer

in

Dinosaurs:

Ancient Fossils, New Discoveries

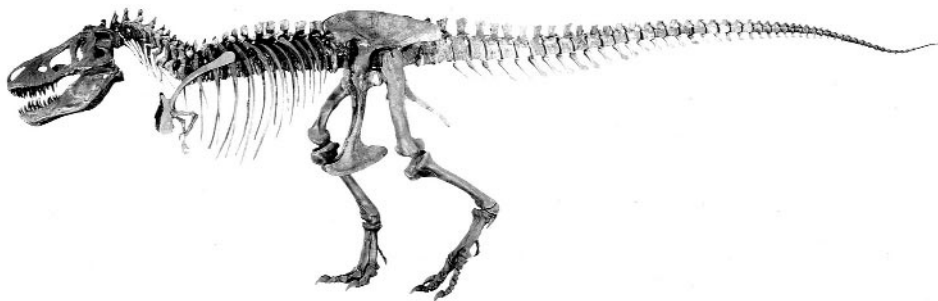
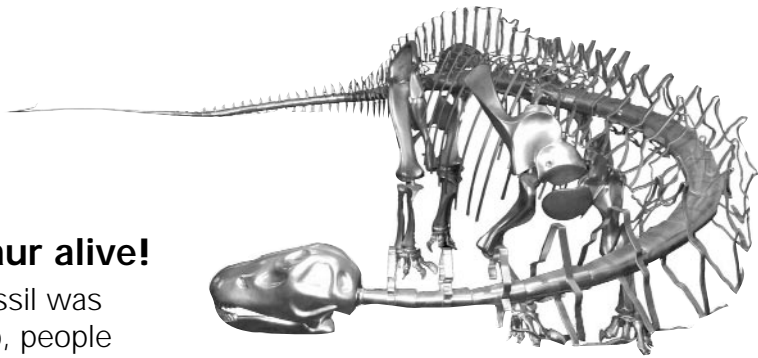


Imagine seeing a dinosaur alive!

Ever since the first dinosaur fossil was identified almost 200 years ago, people have wondered about how these amazing animals lived, moved, and behaved.

Today, paleontologists use new discoveries, new technology, and new ideas to piece together what these living, breathing dinosaurs were really like.

Investigate the scientists' new clues and discoveries as you explore the exhibition.

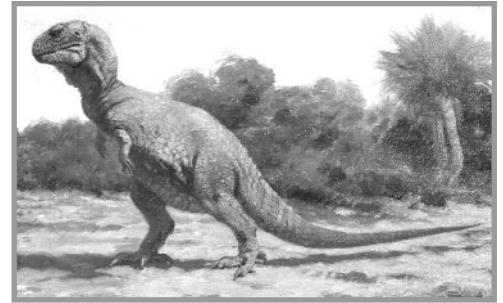




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INVESTIGATE: How Fast Did *T. rex* Move?

1. **Look at this old painting.** Paleontologists used to think that *T. rex* walked upright like this, with its tail dragging. How does this posture differ from the model in the exhibit?



Massive non-avian dinosaurs like *T. rex* and *Apatosaurus* have been extinct for over 65 million years. All we have left of these ancient animals are fossils, so understanding them can be a real challenge.

In order to flesh out these ancient giants, scientists examine fossils, observe movement in living animals, and analyze muscles and bones in animals.

2. **Examine the full-scale and smaller mechanical model of *T. rex*.** Look closely at its head, neck, legs, toes, and tail. Describe the size of these features. How does the size of each feature compare to the others? Compare the size of these features to other things in your everyday life.

3. **Explore the interactive stations.** What happens as you increase and decrease the body mass of the legs of *T. rex*? How does it effect its speed?

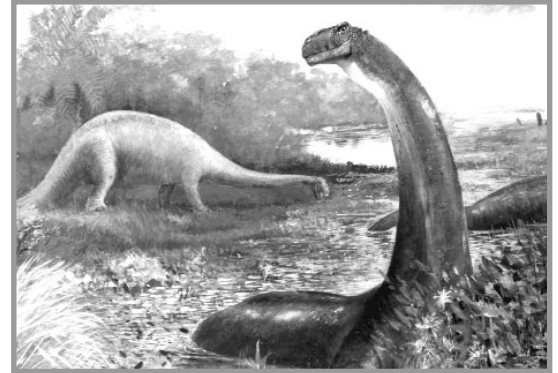
Recent biomechanical analysis suggests that this powerful carnivore may have been a slow walker, and not a fast runner. That's because the bigger an animal gets, the harder its muscles must work just to support its weight.



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INVESTIGATE: Could *Apatosaurus* hold its neck and tail high?

1. **Look at this old painting.** People used to think that these enormous animals stretched their long necks up to nibble on tall trees. How does this posture differ from the model in the exhibit?



Thanks to computer simulations of dinosaur motion, today scientists are starting to think that Sauropods weren't nearly as acrobatic as we once imagined.

2. **Examine the metallic model of *Apatosaurus*.** Look closely at its neck and tail. Describe the size of these features. How does the size of each feature compare to each other? Compare the size of these features to other things in your everyday life.

3. **Explore the interactives, videos, and fossils in this section.**

a. Why do scientists think that *Apatosaurus* were unable to lift their necks very high? How far do they think *Apatosaurus* could move its neck?

b. And where do scientists think they got food if not on tree tops?

Each bone of the *Apatosaurus*' neck fits into the one in front like a baseball into a mitt. This ball and socket joint allows the neck to move freely and determines how far it can go in any direction!

Try this! Move your head up and down, then left to right as far as you can. How far can you move your head?

4. **Examine its tail closely.** How thick is the tail near the body? How thick is it near the end? What do scientists think are the benefits of this whip-like tail?



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INVESTIGATE: Do Dinosaur trackways reveal behavior?

1. Examine the dinosaur trackways and draw them here.

2. How many dinosaurs do you think walked over this space? _____

Dinosaur trackers, like detectives at an ancient crime scene, study dinosaur footprints for clues to behavior.

3. Find the case with the right rear foot of the sauropod dinosaur *Diplodocus*.

When paleontologists look at tracks, why is it sometimes difficult to determine the type of dinosaurs that left these prints?

4. Find the case with the only known *T. rex* footprint. Why are the footprints of this meat-eater so rare?

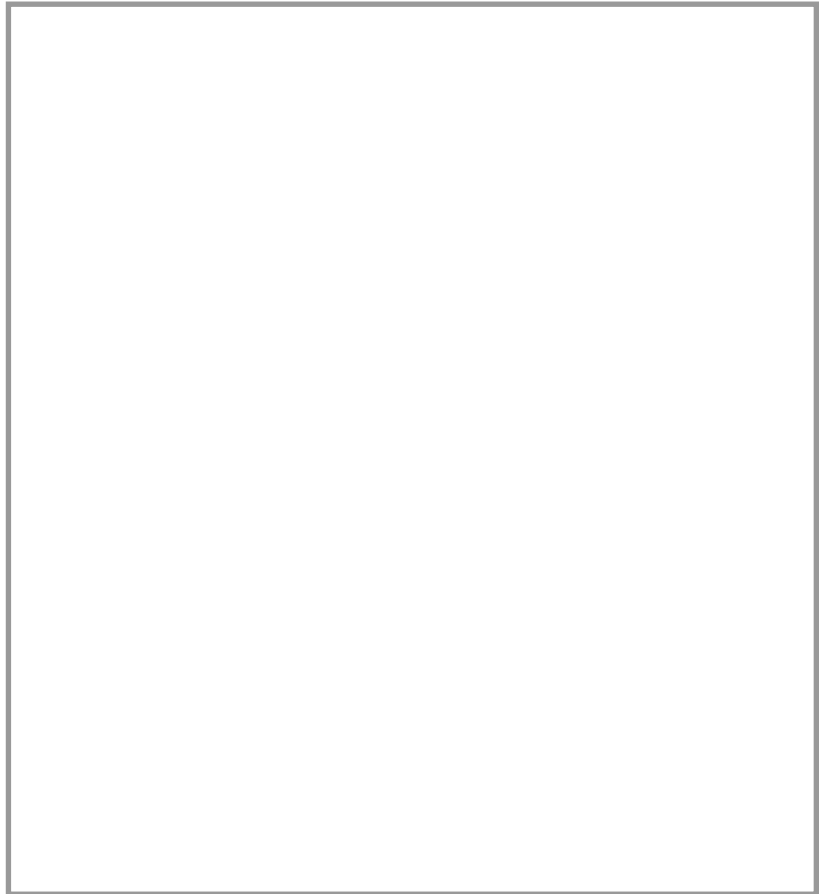


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INVESTIGATE: What purpose did dinosaurs' horns and frills serve?

1. Pick a fossil skull with horns and frills. Draw it in the box. Write what kind of dinosaur it is.

2. What do paleontologists think these horns and frills were used for?



3. What modern animals does your fossil compare to? List them here.

4. What do scientists learn from studying these modern animals?



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INVESTIGATE: What was an ancient forest like?

1. **Travel back 130 million years to a forest in eastern Asia.** Take a look at the plants, insects, and animals that once lived there. How many different kinds of dinosaurs can you find?

2. What things look like plants or animals that you see today?

3. Find the vertebrate bones of a decomposing animal. Is this a fossil? Why or why not?

4. Find the *Dilong paradoxus*, a tyrannosaur related to *T. rex*. How are these animals similar and different? What function do scientists think the feathers served?

5. It's very unusual that such a large number of fossils were found in one area. What factors contributed to this remarkable preservation?

6. **Examine the fossils excavated from Liaoning**, located in the glass case. Pick a fossil and find its matching model in the diorama. Compare the fossil and model and write down your reactions.



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INVESTIGATE: Why did so many animals become extinct?

1. Look at the wall to the left of the video monitors. Which species became extinct about 65 million years ago?

About 65 million years ago, something unusual happened on our planet—over half of plants and animals on the Earth were wiped out. And all non-avian dinosaurs disappeared forever.

2. What are the three theories that scientists think caused this mass extinction?

3. How long did it take for the mass extinction to happen?

4. Which species survived? Why do scientists think these organisms survived?
