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Flowering Plants, also called **angiosperms**, first appeared in the **Cretaceous Period** along with pollinating insects.

The first flowering plants included magnolias and some species of water lilies. The first pollinating insects included bees.

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The extinction of dinosaurs and other large reptiles at the end of the Cretaceous Period enabled mammals to diversify in the **Cenozoic Era**. Because of this, the Cenozoic Era is known as

“The **Age** of **Mammals**.”

Not only were mammals more diverse in the Cenozoic, they were larger too! Paleontologists call these mammals megafauna. Megafauna included animals like the six-foot tall giant beaver and the Megatherium ground sloth, which was 20 feet long!

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Oklahoma’s environment changed dramatically after the Cretaceous extinction. Study the diorama backgrounds in the Cenozoic Era. What was the environment like in Cenozoic Oklahoma?

- a. Humid, tropic forest
- b. Shallow oceans
- c. Cool, dry grasslands
- d. Barren, dry deserts

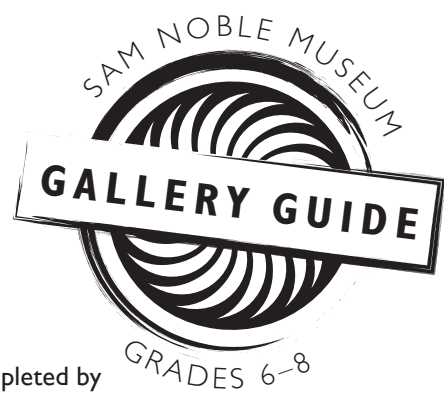
During the Pleistocene, the earth was much cooler and drier than in previous time periods. Whereas Oklahoma was located at or near the equator during the age of dinosaurs, in the Pleistocene, Oklahoma was closer to its present position. Grasslands were, and continue to be the dominant ecosystems in this temperate zone.

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Think about how the environment has changed through time in Oklahoma. What do you think it could look like in the next 500 years? Use evidence from the gallery to support your answer.

Critical thinking question, answers will vary. Answers should be supported by evidence from the Hall of Ancient Life.

Example: “Oklahoma would be drier because the environment goes from ocean to grassland through time”; Or, “I think Oklahoma will be underwater as ocean levels rise because Oklahoma has been underwater in the past.”



HALL OF ANCIENT LIFE

Welcome to the Sam Noble Museum!

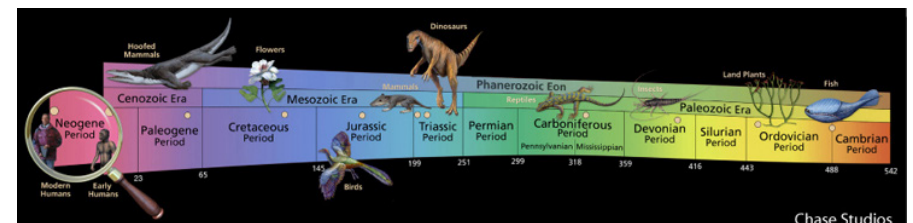
These gallery activities are designed to be completed by a student or group of students, with the help of an adult.

Gallery Guides are available for each of the museum’s three permanent galleries.

The Hall of Ancient Life takes you on a trip through time, from the formation of the earth, 4.6 billion years ago to the end of the Pleistocene Period, 11,700 years ago. Each section of the gallery represents a different time period in Oklahoma’s prehistory so you can see how the environments and animals have changed through time.

Everything you see in the gallery today is based on fossil evidence from plants and animals. Paleontologists, scientists that study ancient life, use this evidence to reconstruct life in the past. In fact, many of the fossil animals and plants you will see were found by museum paleontologists right here in Oklahoma including the giant Apatosaurus and Saurophaganax of the Jurassic Period!

Look at the geologic timeline below to see the different periods represented in the gallery. The timeline can be found on each section of the gallery marking which time period you are exploring.





1. Begin at the Hall of Ancient Life, located on the first floor. The entrance displays cases of plants and animals with a display of the earth in the middle.
2. Explore the gallery to find the answers to the questions below.
3. Start your journey at the entrance and end in the room with the mammoth.



The earth is made up of four layers: The crust, mantle, outer core and inner core.

What two types of rock make up the earth's crust?

Granite

Basalt

The earth's crust is only a thin layer of rock. Granite makes up the continental crust while basalt makes up the oceanic crust.

- 2 Find the rock layers on the wall across from the ocean display. Read about stratigraphy and surface layers, then fill in the blanks below.

The law of superposition states that older fossils are found below younger fossils.

Studying rock layers can give paleontologists relative dates for fossils and help them place fossils on the geologic time scale.



In the next section, look up to see some marine animals from the Cambrian Period. During this period, Oklahoma was covered by an ocean!

Why did many Cambrian animals evolve shells?

Hint: Read the text panels below the trilobites.

- a. To attract mates
- b. For camouflage

c. For protection

d. Because they could

Since fossils are formed from the hard parts of animals, shells and exoskeletons are some of the first non-imprint fossils paleontologists have found from early lifeforms.

- 4 Walk into the Pennsylvanian coal swamp forest. What plant from this time period is the source of coal in Oklahoma today? Lycopod

As plants break down, they form peat. Peat can become buried by sediment and compacted over time to form coal.



- 5 Find the panel titled "The End of Nearly Everything." This refers to an extinction event at the end of the Permian Period.

According to the text, what type of extinction event was it?

- a. Background
- b. Dinosaur
- c. Complex
- d. Mass

The Permian mass extinction resulted in the loss of 96% of all life on Earth. The likely cause of the event was warming oceans and volcanic eruptions.

- 6 An index fossil is a fossil that helps determine the age of a certain rock layer.

What fossil animal is a good index fossil for the Triassic period because it is only found in the Triassic? Phytosaur

Phytosaurs are a group of semi-aquatic reptiles that lived during the Triassic Period. They resemble modern-day crocodiles, but are not genetically related to them.

- 7 Sauropods were large long-neck dinosaurs that could grow up to 150 feet in length.

What is the name of the Jurassic sauropod on display? Apatosaur

Not only is the adult Apatosaurus on display the largest in the world, the juvenile below it is the smallest!

- 8 Find the diorama with Deinonychus and Tenontosaurus. Scientists know the scene in the diorama is accurate because of taphonomy. Describe the study of taphonomy below.

Hint: Read the text panels in front of the diorama.

Taphonomy is the study of what happens to an organism when it dies.

One of the clues that paleontologists found was Deinonychus tooth marks on Tenontosaurus bones. This provided evidence that the Deinonychus were hunting the Tenontosaurus.