

# Virtual Discovery Kit.

## Fossils!

**Calling all paleontologists! Step back on the geological timeline to explore a variety of plant and animal fossils. Learn all about the science of fossils and how prehistoric creatures lived, ate and moved about our world.**

Explore the fossils in the GRPM digital Collections at <https://grpmcollections.org/Detail/occurrences/346> then have fun with these activities.



Pictured above, the American Mastodon is the official Michigan state fossil.

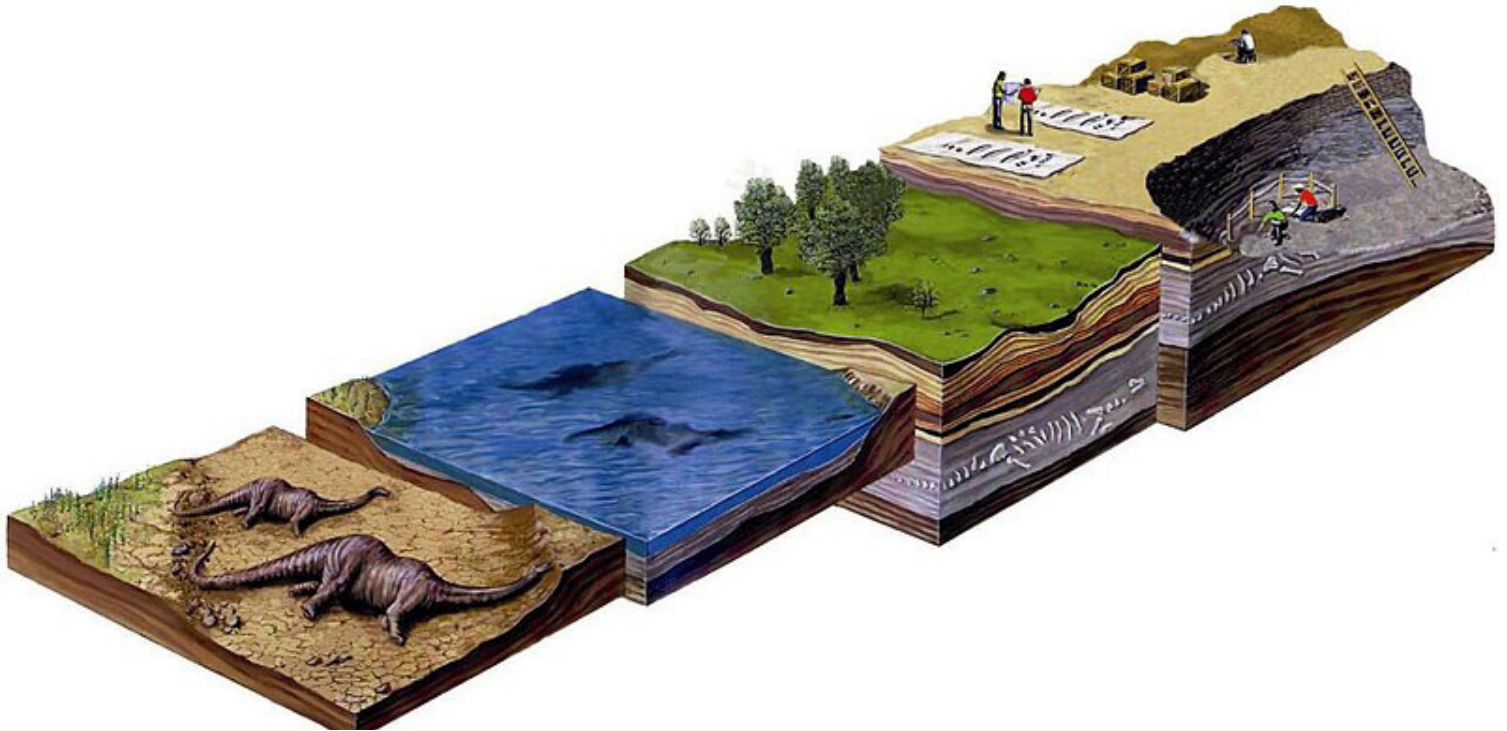
## What are fossils and how are they created?

Fossils are the remains or physical evidence of once living animals and plants. When an organism dies, its remains usually decay and rot away. However, sometimes, plants or animals die and the remains get buried quickly enough under sediment that it turns into a fossil. Fossilization is a very rare process that happens under near-perfect conditions.

Fossilization can happen in a variety of ways, but the two most common processes are described below:

First, the soft tissues of dead organisms decay, leaving just the harder parts such as bones and teeth. If these body parts become buried quickly enough, the sediment around them can begin to thicken and turn to stone. Eventually, the skeleton dissolves, and a mold forms in the stone where the skeleton was. This way, the shape of the original skeleton is preserved in the rock. Rocks that are found with these impressions are called **mold fossils**.

**Cast fossils** actually go a step farther. They can be formed if sediment or minerals fill the molded impression. The minerals or sediment deposited in the mold form a hard cast with the same size and shape of the original skeleton.



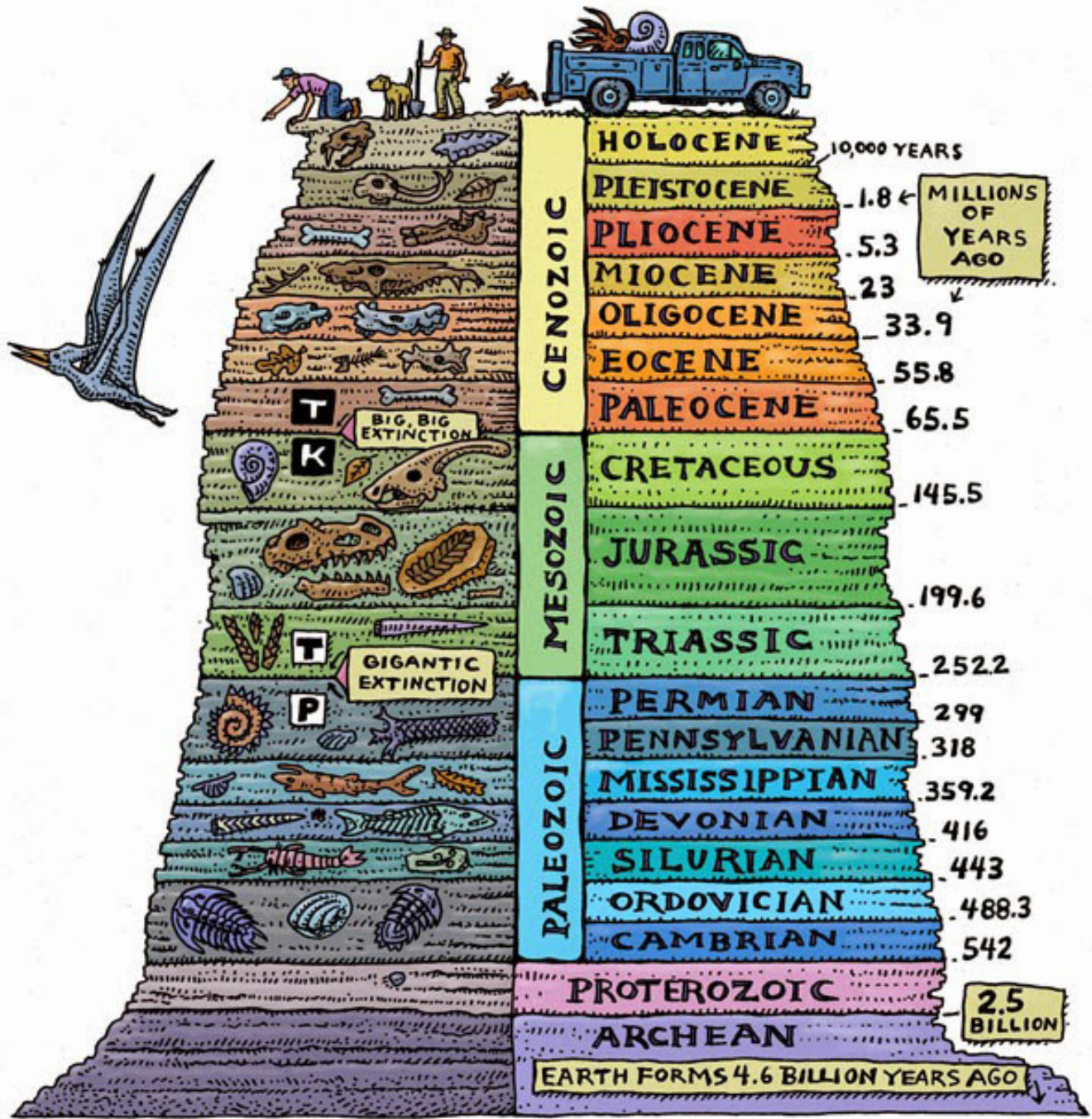
## References:

- [https://ucmp.berkeley.edu/ucmp\\_oldsite\\_nonwpfiles/paleo/fossils/](https://ucmp.berkeley.edu/ucmp_oldsite_nonwpfiles/paleo/fossils/)
- <https://igws.indiana.edu/FossilsAndTime/Fossils>
- [http://geology.isu.edu/Alamo/fossils/process\\_fossilization.php](http://geology.isu.edu/Alamo/fossils/process_fossilization.php)
- <http://www.oum.ox.ac.uk/thezone/fossils/intro/form.htm>

## What can we learn from fossils?

Fossils are the ancestors of today's living organisms. Through fossils, we can learn about plants and animals that have gone extinct and no longer exist on Earth. Fossils are our only evidence about what these organisms looked like. With a fossil record, we can find out information such as:

- Details of an organism's anatomy, shape and size
- Where these prehistoric plants and animals lived
- Information about an organism's life, including details of growth, injury, disease, and other behaviors
- How long ago an organism existed on Earth (based on which rock layer the fossil is found in)
- How life has evolved or progressed through time



## References:

- [https://ucmp.berkeley.edu/ucmp\\_oldsite\\_nonwpfiles/paleo/fossils/](https://ucmp.berkeley.edu/ucmp_oldsite_nonwpfiles/paleo/fossils/)
- <https://igws.indiana.edu/FossilsAndTime/Fossils>
- <http://www.oum.ox.ac.uk/thezone/fossils/intro/proof.htm>

## Museum Specimen Study

Specimens are all around us; they are the plants, animals and minerals that make up the world we live in. They form our understanding of Earth and inform humanity's role in the environment. These natural collections represent our planet's diversity at a particular place and time.

### Reading an Object

Learning to 'read' a specimen is a skill to be acquired through practice, just like reading a book. Specimen observations help teach us how to really look at an object and make inferences! Some questions you ask of any natural specimen are included here:

#### Describe

- What color(s) is it?
- Describe its texture, shape, size, structure (e.g., rough, furry, circular, large, four-legged, etc.)

#### Role

- What is it? Animal, plant, rock/mineral?
- What is its role in nature?
- Where is the specimen placed in food chains?

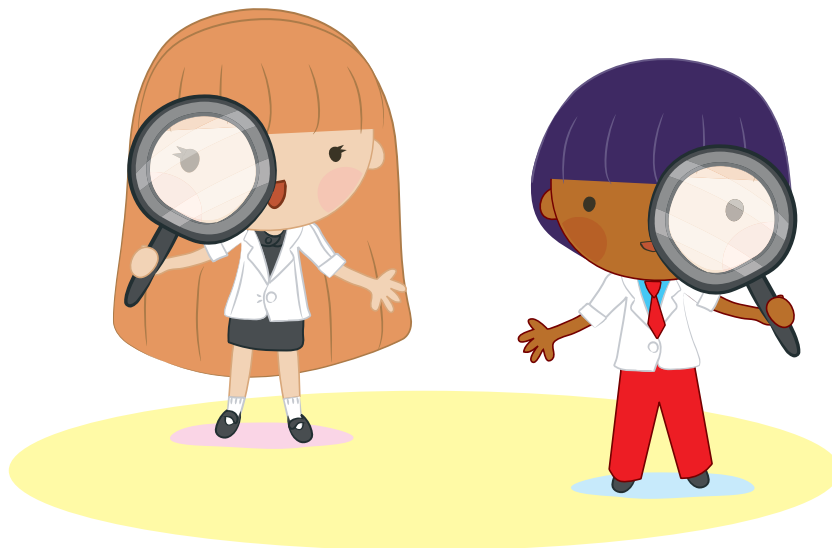
#### Setting

- What habitat (rainforest, desert, tidepool, etc.) would the specimen be found in?
- What is its range (across Michigan, the United States, North America, etc.)?
- Is the object found in the past, present, or both?
- What characteristics helped the specimen survive in its habitat?
- What organisms do you know today that share similar characteristics with this specimen?

#### Big Idea

- What can we learn from it?
- Why was this object chosen from the GRPM Collections?
- How could this specimen be used to tell a bigger scientific story?

Practice your specimen observations with the **Fossil Observations guide!** You can make a detailed observation of each fossil in the Fossil [Discovery Kit Collection](#).

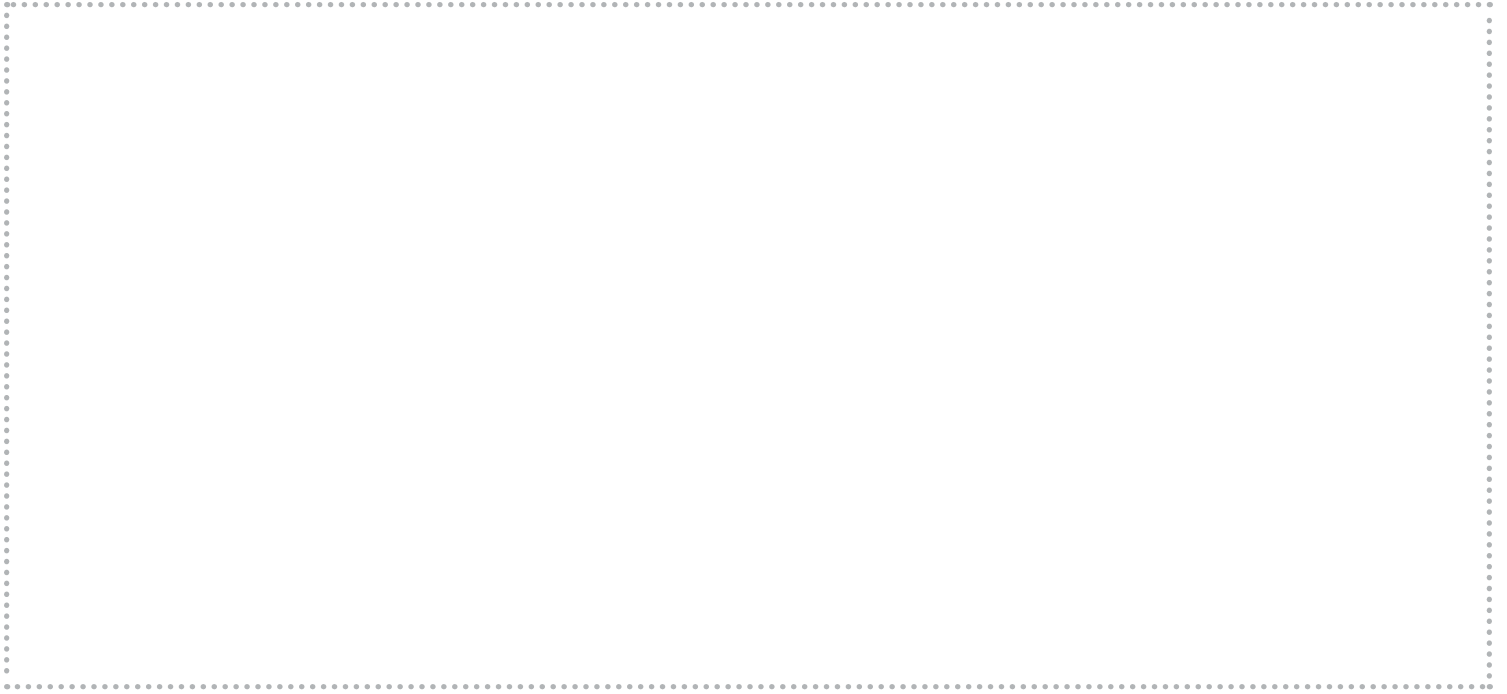


## Fossil Observations

Specimen Name: \_\_\_\_\_ Accession Number: \_\_\_\_\_

### Sketch or describe your detailed observations of the specimen

Consider its texture, appearance, shape and size. Record patterns, markings and anything else you notice.



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### Record Measurements:

Length: \_\_\_\_\_

Height: \_\_\_\_\_

Thickness: \_\_\_\_\_

What type of habitat do you think this species lived in? Why?

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Does this fossil specimen resemble any current living organisms or parts of a living organism?

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## Clay Trilobite Activity

### Trilobite Background

Trilobites lived during the Precambrian Period-Permian Period, 540-245 Million years ago. They were creatures that lived in oceans and seas; they crawled along the bottom and some types could swim. Different trilobite species were different sizes--some of the smallest were only 1 cm long and the largest were 70 cm or longer. Trilobites lived on earth for roughly 300 million years. They are related to crustaceans, spiders, and other insects that are alive today. The name trilobite comes from the fact that their bodies can be divided into three axial (long direction) sections.



### Make your Own Fossil Model

1. Roll a piece of clay into an oval “rock” shape to create the trilobite’s body. 
2. Roll one of the smaller pieces into a cone shape. This piece should be almost as long as the trilobite’s body. 
3. Press the cone shaped piece into the center of the trilobite’s body. 
4. Use smaller long, thin snake-like shapes to give your trilobite antennae or other features. 
5. Scratch markings onto the trilobite’s body with your pencil. 

### References

- <https://www.amnh.org/research/paleontology/collections/fossil-invertebrate-collection/trilobite-website>
- <http://www.eartharchives.org/articles/the-colorful-world-of-the-trilobites/>
- <https://www.nationalgeographic.com/news/2013/3/130327-trilobite-spots-marine-paleontology-science/>

## What do you think?

*Tyrannosaurus rex* was a carnivore, meaning its diet was made up of meat or flesh. The T. rex lived during the Cretaceous period, 83.6 million years ago to 60 million years ago. It was one of the largest meat-eating dinosaurs that ever lived, and could grow to 40 feet long and 15-20 feet tall. T. rex teeth were jagged and cone-shaped and most likely used to rip and tear flesh. Scientists think that a single T. rex could eat up to 500 pounds of meat in just one bite!



- Use your imagination to sketch your own dinosaur! Give it a name and plan out what it would eat. What special body parts and adaptations would it have to hunt and defend itself?

- What do you think is the coolest fossil in this kit? Why?

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- What is the most interesting thing you learned in this discovery kit?

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- What is one question you still have about fossils?

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## References:

- <https://www.nationalgeographic.com/animals/prehistoric/tyrannosaurus-rex/>

## Learn more!

### Fossil Formation:

- <https://wgvu.pbslearningmedia.org/resource/tdc02.sci.life.evo.becfossil/becoming-a-fossil/en/>
- <https://wgvu.pbslearningmedia.org/resource/idptv11.sci.ess.earthsys.d4kfos/fossils/>
- <https://wgvu.pbslearningmedia.org/resource/ess05.sci.ess.earthsys.fossilintro/how-a-dinosaur-became-a-fossil/en/>
- <https://wgvu.pbslearningmedia.org/resource/ess05.sci.ess.earthsys.fossiltype/types-of-fossils/#.Xnua4tNKjUI>
- <https://ucmp.berkeley.edu/education/explorations/tours/fossil/index.html>

### Geologic History:

- <https://www.hhmi.org/biointeractive/deep-history-life-earth>
- <https://wmich.edu/sites/default/files/attachments/u263/2014/GeologictimeLineHelper.pdf>
- <https://ucmp.berkeley.edu/education/explorations/tours/stories/middle/intro.html>
- <http://stratigraphy.org/index.php/ics-chart-timescale>

### Michigan Geologic History:

- [https://www.michigan.gov/documents/deq/GIMDL-GGGHM\\_302331\\_7.pdf](https://www.michigan.gov/documents/deq/GIMDL-GGGHM_302331_7.pdf)
- [https://www.michigan.gov/documents/deq/GIMDL-PA03\\_216189\\_7.pdf](https://www.michigan.gov/documents/deq/GIMDL-PA03_216189_7.pdf)
- <https://wmich.edu/sites/default/files/attachments/u263/2014/GeologyofMichiganMoredetailed.pdf>