

Discovery Guide

Prehistoric Life

High School

Welcome to the University of Michigan Museum of Natural History!

These guides are intended to focus student attention and start conversations about topics in natural history.

Pre-visit tips

Please make copies of this guide for your students before coming to the museum. This will ensure that the proper number of guides are available for your group.

Bring pencils and clip boards or notebooks to write on.

Please divide your students into groups of about 5 to 10 students.

Provide the chaperones with a copy of the answer guide(s).

While Visiting

Encourage questions! If you cannot find the answer, ask the student host.

Encourage touch! People learn best when as many senses as possible are engaged in the learning process. Please look at, listen to, and even touch exhibits that are not behind barriers.

Encourage discovery! Remind students that it is not a race but an adventure of discovery.



In the Classroom

The following questions and prompts are designed to promote in-classroom discussion and writing across the curriculum.

Questions?

Please visit our website at www.ummnh.org or call us at **734.764.0480**.

Answer Guide

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1. Carbon is an essential part of organic molecules that make up living organisms. *Grypania spiralis* is important because it is the oldest known eukaryote and is found in Michigan!

2. Our fossilized *Araucarioxylon* trunk formed after the tree died and was covered in mud and sand. Lack of oxygen prevented decay, minerals penetrated the wood and replaced organic material. This is how a fossil is formed. During fossilization, organic material is replaced completely by inorganic minerals, so a fossil is a rock.

3. Some body plans went extinct because they were outcompeted by other body plans.

4. algae, lepidodendron, ferns, conifers, morning glory

5. Trilobites existed for 300 million years. Trilobites can help date a rock sample because trilobite form changed over time. The form found will date the rock around it.

6. A cladogram, like a family tree, shows evolutionary relationships. Shark fossils are rare because their skeletons are almost entirely made of cartilage, which doesn't fossilize.

7. There are ten *trimerorhachi* skulls. Skulls are easier than vertebrae for counting individuals because each has only one skull.

8. Same: all skulls feature **eyes facing forward and sharp teeth.**

Different: Sabertooth has different **tooth shapes**, and every animal has a different **skull shape.**

Tooth shape tells what **types of food** animals ate - carnivores have teeth shaped like canines and herbivores have teeth shaped like molars.

9. *Archaeopteryx* had feathers and a beak like a bird's, and teeth and a bony tail from its dinosaurs ancestors.

10. The teeth are different because *Edmontosaurus* was a herbivore and *Allosaurus* was a carnivore. *Edmontosaurus* teeth allowed it to grind vegetation where *Allosaurus* teeth allowed it to tear flesh and meat.

11. *Sauropods* swallowed stones called gastroliths, which helped grind vegetation.

12. The first hominids evolved around 3.5 million years. Unlike their ape ancestors hominids were bipedal, walking upright on two legs.

13. The most significant change from *Australopithecus africanus* to *Homo sapiens* is increased brain size.

14. *Maiacetus* is known as 'mother whale' because a fossil of a pregnant *Maiacetus* was found, indicating it is an ancestral whale which gave birth on land.

15. *Basilosaurus* limbs have evolved from *Maiacetus* limbs in that the hind limbs are smaller and front limbs resemble fins. These limbs may have changed because as *Basilosaurus* evolved to live only in water, its streamlined limbs were more adaptive for swimming.

16. A mastodon browses using cusped molars while a mammoth grazes with flattened molars. (Mastodon means *breast teeth*).

The male mastodon was likely scavenged by humans and the toes were probably removed during processing.