**The Houston Museum of Natural Science**

**Morian Hall of paleontology**

Knowledge Hunt

3rd – 5th grade

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Thank you again, and we hope you enjoy your field trip to HMNS!

### How to use this guide:

1. Feel free to edit the questions to suit your student group.
2. The Knowledge Hunt is specifically for the Morian Hall of Paleontology.
3. Visitor services and security staff are posted around the Museum and will be happy to assist you in finding any of the locations or objects mentioned.
4. Please ensure that one chaperone is with every group of ten students at all times as they complete these activities.

For high school curriculum, please contact [**curriculum@hmns.org**](mailto:curriculum@hmns.org%0d%0c)

# **Knowledge Hunt**

Instructions: Answer the following questions while exploring the Morian Hall of Paleontology, where you will journey from the beginning of time to modern times.

## Precambrian Era

### Stromatolites

When you enter the hall, the first fossils you will see are stromatolites. Look at the four samples on the right side. These show different parts of the stromatolite bacterial mat. Draw two different views below:

|  |  |
| --- | --- |
| **Top View** | **Side View** |
|  |  |

Describe the stromatolite on the far left. What makes it different from the others?

What do you think changed in the environment to make it that way?

## Paleozoic Era: Cambrian – Devonian Period

### Sam Stubbs

People who do a lot of research might have things named after them. Samuel Stubbs, who lives in Houston, collects trilobites and has given many to our museum. Look for a big trilobite named after Sam Stubbs.

What is its full scientific name?

### Devonian Trilobites

As trilobites adapted to their changing environment, their inherited traits changed. Head over to the Devonian period. Find the case of trilobites that contains six specimens, four of which are *Drotops armatus*.

Describe the difference between the early Devonian and the late Devonian trilobites.

|  |  |
| --- | --- |
| **Early Devonian Trilobite** | **Late Devonian Trilobite** |
|  |  |

In the space below, present a hypothesis as to why trilobites from the early Devonian look different than those from the late Devonian. *Hint: think about the environment and predator/prey relationships.*

**Hypothesis:**

They look different because

### Early Permian Period

### Mural: The Life of the Craddock Bone Bed

Take a moment to look at the environment of the Craddock Bone Bed. List the landforms you see.

Look at the animals that are depicted in the mural. List a few body features that worked well with the environment.

### *Dimetrodon*

Look at the Dimetrodon model with the big sail on its back. Dimetrodon is not a real reptile like lizards or crocodiles. It is more like a mammal. One reason is that its eyes face the front. What do you think this says about what Dimetrodon eats?

In the space below, draw a picture of Dimetrodon’s head.

Why do you think it was good for Dimetrodon to have different kinds of teeth?

## Mesozoic Era: Triassic Period

### Mural: A Triassic Pond in the Dockum Age

Look at the giant *archosaur* in the mural. What modern animal does it remind you of?

How does the archosaur's color help it hide in its surroundings? Why is that important?

## Jurassic Period: Jurassic Oceans

### Plesiosaur Cast

Look at the cast of the plesiosaur. What type of environment would this creature live in?

Which adaptations did the plesiosaur have that helped you decide? Explain your answer.

### *Gyrodus circularis*

Look at the *Gyrodus circularis*. Notice its sharp, pointy teeth. This fish survived by eating coral. How do you think its body, teeth, and fins helped it to eat coral and stay healthy?

## Late Jurassic Period

### *Stegosaurs* vs. *Allosaurus*

How are Stegosaurus and Allosaurus different and the same? Which one could run faster? By looking at their bones, which one do you think could move better in muddy places? Which one ate meat (carnivore), and which one ate plants (herbivore)?

|  |  |  |
| --- | --- | --- |
| **Compare/Contrast** | ***Stegosaurus*** | ***Allosaurus*** |
| **Which runs faster?**  **Why?** |  |  |
| **Which is better on muddy terrain?**  **How do you know?** |  |  |
| **Carnivore or Herbivore?**  **Evidence?** |  |  |

## Cretaceous Period

### *Tyrannosaur* Tail

The Tyrannosaurus had a long and muscular tail, which allowed it to balance its weight and walk on two legs. Find Wyrex, the *T-rex* that has part of his tail bitten off. Wyrex is missing about 1/10 of his body weight!

If an average *T-rex* with a full tail weighs 18,000 pounds, calculate Wyrex’s weight. Show your work.

### Mural: “Late Cretaceous”

Look at the magnolia trees at the bottom of the mural. What do they need to survive?

If none of the vegetation in the mural survived, what would happen to the *Triceratops* (herbivore) or the *Tyrannosaurus rex* (carnivore)?

### *Quetzalcoatlus*

Look at the point at the base of the *Quetzalcoatlus’* long head. How do you think this helps him fly through the air? **Hint:** Think about a rudder on a boat.

Look at the *Quetzalcoatlus* eggs. List three inherited traits these babies might have once they hatch. How will each trait help them survive?

1.

2.

3.

Based on the scene before you, what traits might the babies need to learn from their parents to survive?

### End Cretaceous: Death of the Dinosaurs

There are several hypotheses about the end of the dinosaurs. Consider the two below:

1. A big meteorite hit the Earth, causing a lot of problems. The sky got dark, the weather became colder, and it started to rain acid. This made it hard for dinosaurs to find food and survive. But some other animals from that time continued to do well, which made scientists curious and confused.
2. The invasion of a foreign species, which became pests, may have forced the dinosaurs to extinction. Think about these two theories and the fragile ecosystem.

Which theory do you think best fits the “Death of the Dinosaurs’? Explain why you picked your answer.

## Cenozoic Era: Paleogene Period, Eocene – Miocene Epoch

### Jurassic Petrified Wood Gallery

Look at the big cut-through part of the petrified sequoia tree trunk. You can tell how old a tree was when it died by counting the rings in its trunk. Check out the rings in this tree and guess how old it was when it died.

### Amber

Look at the amber specimens. What types of insects do you see?

Do they look like modern-day insects?

Have these types of insects changed very much over time? Why do you think they have or haven’t?

### *Megalodon*

Look at the Megalodon and its prey. Besides climate change, can you name another reason Megalodon may have gone extinct?

## Pliocene and Pleistocene Epochs

### Giant Bull: *Mammut americanum*

Early humans hunted mammoths and mastodons. Why do you think humans would have spent more time hunting these large woolly creatures instead of animals like the saber tooth cats?

What do you think humans used the mammoth or mastodon for other than as a food source? List as many answers as possible.

Look at the three “cavemen.” They must work together to hunt large game. Each one had a different job. Which job would you want if you were hunting mammoths and mastodons? Why?

### Mural: “The Human World”

Find the *Kenyanthropus* *platyops* using a “tool” to grab a meal from the termite mound. Is this an inherited trait or a learned behavior? Explain your answer.