

Name: _____

Lab #: _____

The Milwaukee Public Museum optional extra credit assignment

Circle your due date:

Monday labs	Tues. labs	Wed. labs	Thurs. labs	Friday lab
May 4	May 5	May 6	May 7	May 7*

*There are no classes on May 8th, so Friday lab students must turn in their assignment to Jake Walczak in LAP 332 or in Jake's mailbox outside LAP 366 by the end of the day on May 7.

READ and COMPLETE THIS BOX BEFORE TURNING IN YOUR ASSIGNMENT.

By submitting this assignment for extra credit, I am stating, on my honor, that I actually visited the museum and completed the answers through my own efforts. I fully understand that it would be a violation of student honor code and University code of ethics to turn in someone else's assignment for credit. My museum admission wristband is attached as verification that I did indeed visit the MPM.

Signature _____ The date I visited the museum was _____

Museum information: The Milwaukee Public Museum (MPM) is located in downtown Milwaukee at 800 W. Wells Street, Milwaukee, WI 53233, phone (414) 278-2700, website <http://www.mpm.edu/>. Public parking (fees apply) is available just north of the museum in the MacArthur Square parking garage, which is accessible from James Lovell Street (formerly 7th Street). Metered street parking is limited, but also available, and free on weekends. Check UWM Parking and Transit for available bus routes.

Museum admission: The museum is open Monday-Saturday 9:00 am to 5:00 pm and Sunday 10:00 am to 6:00 pm. General adult admission is \$11.00 and college students with ID pay \$10.00. However, admission is FREE for Milwaukee County residents on Mondays. Bring your UWM student ID!!

2% EXTRA CREDIT AWARD: You must attach your museum admission wristband to this assignment as proof of your visit to the MPM. Assignments without wristbands attached will not be accepted for credit. Students will earn the full 2% extra credit if answers on this assignment are legible, complete and better than 80% correct.

Begin on the first floor in the exhibit entitled "**Exploring Life on Earth**".

Stop 1 – Torosaur exhibit

1-1. The entrance to the "*Exploring Life on Earth*" exhibit features the skeleton of a horned dinosaur known as a torosaur. Where did this particular dinosaur skeleton come from (list formation name and State)?

Formation: _____

State: _____

1-2. The skull of this skeleton, measuring 9 ft. by 8 ft., is one of the largest dinosaur skulls ever found. What else is so important about this particular skeleton?

1-3. You'll notice that this skeleton display has brown and white colored bones. Which bones are actual recovered fossils and which ones are just replicas of the bones that weren't preserved.

Fossils: _____

Replicas: _____

Look at the "Horns & Hypotheses" display to the right for the next two questions.

1-4. What is paleontology?

1-5. This display indicates that MPM paleontologists used the *Scientific Method* to test a hypothesis regarding the puncture wound on this particular skeleton. What was their hypothesis? And what was the conclusion of their hypothesis testing?

Hypothesis: _____

Conclusion: _____

Stop 2 - Mineral and Rock exhibit

Look at the octagon-shaped glass display case of minerals for the first two questions.

2-1. What factors influence the size of mineral crystals?

2-2. Approximately how many different colors of fluorite crystals are displayed in this case? ____

Now look at the glass display cases with minerals and rocks on the opposite wall.

2-3. What type of mineral comprises the largest geode on display? _____

2-4. What State is the *marcasite* stalactite from? _____

2-5. The iron meteorite specimens on display (to the right) are composed of an iron-nickel alloy, which is considered similar to what?

Now look at the plate tectonics wall display and video for the next two questions.

2-6. How many years ago were the continents arranged in what is known as "Pangaea, the supercontinent"?

2-7. What three fields of evidence are listed to substantiate the theory for movement of continental plates throughout geologic time?

Stop 3 – Cave exhibit

3-1. How are caves formed?

3-2. Stalactites grow (*circle one*: up or down) and stalagmites grow (*circle one*: up or down). Perhaps now you can fill in the blanks on this phrase to help you remember which are stalactities and stalagmites:

“_____ hang tight to the ceiling and _____ might reach the ceiling!”

3-3. How do stalactites and stalagmites form? and what are they made of?

3-4. Geodes are most often formed of different varieties of what mineral? _____

Stop 4 – “A Gallery of Fossils” & “Precambrian Era” Exhibits

4-1. What are fossils?

4-2. List three of the six types of fossilization described in this display.

4-3. Which one of these fossilization types is most often responsible for preservation of vertebrate bones and invertebrate shells?

4-4. Approximately when did Earth acquire its oxygen-filled atmosphere?

Stop 5 – Paleozoic Era

Look at the *Silurian* reef display first.

5-1. The display indicates that 410 million years ago (mya) the North American Plate (in particular, the area now known as SE Wisconsin) was not in the same geographic location as it is now. Instead, where was it? and what was the environment in SE Wisconsin like at that time?

5-2. Notice all the shallow marine organisms that thrived in this area at that time. What are the large predators on display in this exhibit?

Now move along through the Late-Paleozoic Era exhibits to the displays entitled: "Colonization of the Land"; Carboniferous Coal Forests"; and "Primeval Forest..."

5-3. Determine the relative ages of these three events:

- the first recognized amphibian, *ichthyostego*, lived _____ mya
 - diverse lowland swampy environments were abundant _____ mya
 - dense tropical forests were concentrated along equatorial regions _____ mya.
-

Stop 6 – Mesozoic Era

Begin at the *stegosaurus* exhibit.

6-1. The Mesozoic Era gave rise to what 'famous' creatures? _____

6-2. Where did the *stegosaurus* live? and how long ago? _____

6-3. Despite its typical size of more than 15,000 lbs, the *stegosaurus*'s brain was known to weigh only approximately _____ ounces.

Now visit the impressive exhibit featuring a *tyrannosaurus rex* feasting on a *triceratops*.

This diorama is a re-creation of possible events that may have occurred ~66 mya in the area now known as eastern Montana. Evidence to support this re-creation is primarily based on the abundant dinosaur skeletons preserved in the Hell Creek Formation.

Look at the glass case display cabinets behind you, to either side, featuring the Hell Creek Formation Display, and the Extinctions Display, for the next set of questions.

6-4. The Hell Creek Formation is primarily composed of what two types of sedimentary rocks?

6-5. How was the Hell Creek Formation formed?

6-6. Why are there so many well-preserved dinosaur skeletons within this formation?

6-7. Several theories are suggested for the “Great Extinction” of dinosaurs ~65 mya. After reviewing the (nine) theories suggested for extinction of the dinosaurs, list two reasons that you believe to be the most plausible.

Stop 7 – Cenozoic Era

7-1. The Cenozoic Era marks the movement of continents to their present day locations, as well as the rise of what type of creatures?

7-2. Although many mammals did not migrate from their original or “ancestral” lands during the Miocene and Pliocene Epochs, two particular mammals did migrate freely, resulting in populations throughout several of our present day continents. What are these two types of mammals common in the Cenozoic Era? Which one is now extinct?

7-3. The “Ice Age Beastiary” display features several mammals that lived just 10,000 years ago. What is the theory suggested for extinction of these mammals?

Stop 8 – Glacier

Before you answer the first two questions, (and before you enter the ice cave), look at the glacier and try to imagine this glacier, extending away from you and eventually rising to a thickness of a mile (5,280 ft) or more. Also, try to envision what the environment at the ice margin (as depicted here) might actually look like.

8-1. Do you expect the ice margin (i. e., front of the glacier) to look clean? Why or why not?

8-2. What happens to all the debris as the glacier melts?

Now enter the ice cave for the remaining questions at this stop.

8-3. During the most recent glacial advance (Wisconsinan), the climate, forests, and wildlife were quite different than present day. Identify four animals common to Wisconsin that are now either extinct or have migrated to the tundra.

8-4. Four major continental glacial advances are recognized in North America. They are named for the state which exhibits evidence of the furthest extent of that particular advance. So obviously the Wisconsinan advance extended only as far south as Wisconsin. Identify the three other major continental glacial advances, in order from most recent to oldest.

Wisconsinan

(For interest and education, you may want to listen to some of the 2-3 minute videos available at the touch of a button in the ice cave to the right. For those going to Devil's Lake on the field trip, the "Glacial Lakes" video includes a brief explanation of how Devil's Lake was formed.)

At this point, you'll need to go back out to the 1st floor lobby for a few more geology displays. So continue on through the "Rain Forest" exhibit and check out all the biological diversity on display on the main level, as well as on the 2nd level walkways. Back out in the 1st floor lobby area, you'll continue to the left, to the exhibits entitled "Exploring Life on Earth – Into the Lab" (They are to the left, when looking toward the butterfly exhibit at the end of the hall).

Stop 9 – Exploring Life on Earth: Into the Lab

Start at the display entitled "Geology Lab – Preparing Fossils".

9-1. Identify the five types of fossils shown in this display.

9-2. Why do geologists study the fossil record?

Behind you (if still facing the fossils), you will find a floor-to-ceiling core display (left) and two displays entitled "Exploring Microfossils" (center) and "Milwaukee's Deep Tunnel Project" (right).

9-3. The display of Core I30-8-NS (to the left) exhibits the rock types present beneath Milwaukee, and in particular, the UWM campus. This core was collected from the northeast corner of the UWM campus during the design phase of Milwaukee's Deep Tunnel Project. Review the information presented on this core display to fill in the blanks on the table below.

Formation	Age (period)	Rock type	Thickness
(glacial deposits)	Quaternary	(glacial deposits)	190 ft
Antrim Shale	Devonian	mudstone & shale	10 ft
Milwaukee Fm.	Devonian	dolostone & mudstone	60 ft
Thiensville Fm.			
Waubakee Fm.			
Racine Fm.			
Waukesha Fm.			
Manistique Fm.			
Burnt Bluff Group			
Mayville Fm.			
Maquoketa Fm.			

9-4. The display entitled "Exploring Microfossils" features microfossils collected from cores such as Core I30-8-NS. You can see many examples under the microscopes. What is a microfossil?

9-5. According to the bedrock geology map in the display entitled "Milwaukee's Deep Tunnel Project", and using the city map as a reference to find the UWM campus, it appears that the bedrock surface underlying the UWM campus is different from the east to the west side of campus. Which formation evident on the east side of campus is apparently not present on the west (Lapham Hall) side of campus?

Now look at the exhibit on the back wall entitled "From Montana to the Museum."

9-6. This exhibit features a model of MPM paleontologist (and adjunct UWM geology professor) Dr. Peter Sheehan pointing to a pink and black layer in the rock. What is so significant about the pink and black layer in this large rock that the MPM staff and volunteers brought it all the way from Montana to the MPM in 1998?

Now look at the exhibit entitled "Earth's Five Mass Extinctions."

9-7. Review the information displayed about the five mass extinctions (recognized by the *Skepkoski Curve*) to fill in the blanks on the table below.

Period	Time	% of families lost	Significance
Cretaceous	65 mya	16%	mammals survive, dinosaurs lost
Triassic	210 mya	22%	conodonts lost
Permian			
Devonian			
Ordovician			

9-8. What does this "Mass Extinctions" exhibit suggest about present day human activity?

FINALLY, feel free to check out the "Geology Lab: Tracking Mass Extinctions" exhibit to your right and the large diorama entitled "Hell Creek Formation, Montana, 65 Million Years Ago...and Today" across the lobby hall "just for fun and geologic enrichment !" The scientists featured in the Hell Creek diorama are former UWM biology professor Dr. Claudio Barreto, and adjunct UWM geology professors Dr. Peter Sheehan and Dr. Rodney Watkins.

While you're still here, you might as well check out some living biodiversity by touring the live butterfly exhibit at the end of the hall!

Final comments welcome: _____

Turn in this assignment to your teaching assistant by the due date you circled on the first page corresponding to the day of your lab.