Arizona Museum of Natural History

53 N. Macdonald, Mesa, AZ 85201, 480-644-2230

Discounted entrance fee for students WITH ID.

Attach your receipt to this exercise as proof of your visit.

Although many of the "travelling" exhibits that are displayed at the Museum are great and the Southwestern US section is quite relevant and complete, *this exercise will consist of questions to be answered from the Earth Science portions of the Museum*. From the entrance, these exhibits will be found through a doorway to your right. ***Begin as indicated by the "start here" arrow on the map below and it will wind its way down in a path toward the lower level. You will eventually end up upstairs (but not at the very top level) before returning down to the lower level and lobby area. Look both left and right as you travel down the path.*** Questions here are basically in order if you stay on the main path.

ENJOY YOUR VISIT!

Museum areas 2, 3 and 4 on the front page map

1. Studying the models of Earth through time, the Moon formed approximately _____ billion years ago.

2. Look at the series of images (produced by Ron Blakey @ NAU) that shows the distribution of land through time. Not until about _____ million years ago do we see the continent of Africa separate from the continent of South America.

3. The composition of the Tucson Meteorite is _____% iron.

4. The Barringer Crater impact (i.e., Meteor Crater/Canyon Diablo Meteorite) formed _____ years ago. The impactor was _____feet across and left a crater (pit) almost _____ in diameter (wide).

5. Of the over 4,000 known mineral species, approximately _____ can be found in Arizona.

6. Copper minerals often occur in bright colors of blue and green. This is because elements in these deposits combine with oxygen from _____ and become oxidized. The brighter colored minerals are usually found closer to Earth's _____.

7. Quartz is found in a wide variety of colors due to the inclusion of minor amounts of other elements. Amethyst (the purple variety of quartz) contains small amounts of _____ or _____ whereas Citrine (a yellowish-orange variety) contains small amounts of another type of _____.

8. The largest cavern in the world is located in _____; the longest cavern is located in _____.

Museum areas 5 & 6 on the front page map

9. The majority of the free oxygen (O_2) in our atmosphere is produced by the process of _____.

10. The first sexual reproduction of organisms – allowing for the mixing of genetic material – occurred _____ years ago.

11. The 2nd level from the bottom of "Jurassic Arizona Mountain" (the feature around which you are walking on your path) includes a layer called the Morrison Formation that is exposed in northeastern Arizona. Primitive _____-like *opisthias* lived here at that time, as did huge numbers of termites that built nests over _____ meters tall!

<<Do not go up the stairs to the dinosaur skeletons yet. Stay left on pathway- you will return to here later>>

12. Rocks deposited in the Permian period in Arizona contain non-bone evidence such as _____ left behind by several types of organisms including pre-dinosaur relatives and insects.

13. Trilobites were hugely successful during the Paleozoic Era but went extinct at the end of the Era. Their closest living relative is the _____

Museum areas 21-26 on the front page map

14. Chondrichthyans are commonly known as _____. Approximately 750 species still survive today, even though this group first originated hundreds of millions of years ago.

15. Therapsid reptiles (like *Inostrancevia alexandri*) are the evolutionary predecessors to the _____, as partially evidenced by their up-right posture and differences in teeth from other reptiles.

16. The _____ formation is exposed as the Painted Desert and Petrified Forest in Northern Arizona.

17. The state fossil of Arizona is _____.

18. Petrified wood is made of ancient wood that has been replaced with _____.

19. About 100 million years ago, northeastern Arizona was covered by _____, as evidenced by fossils of creatures like pliosaurs and mosasaurs found in Cretaceous-aged rocks here. This means either that the local rocks have since been lifted up or that the sea level at that time must have been _____ then than it is today (or both).

20. The garfish & bowfin fish in the aquarium are known as _____ because these types of fish has existed since 100 million years ago.

<<The next question is answered at the base of Dinosaur Mountain near the pond>>

21. The Chinle formation contains fossils of various freshwater lake and terrestrial (land) organisms. An example of one of these lake organisms would be _____, whereas an example of a terrestrial organism found in this formation would be _____.

<<At this point go up two short flights of stairs to see the dinosaur skeleton exhibits. >>

Museum area 7 on the front page map

22. The *Probactrosaurus gobeinsis* is an example of a(n) _____ dinosaur that was one of the first dinosaur types ever found.

23. T. bataar (found in Asia) is a related example of the type of dinosaur found in North America that we know as _____.

24. The Sonorasaurus is the sauropod for which we have the most complete North American fossil. It is a smaller relative of the dinosaur known as a _____.

25. The _____ is one of the last plant-eating dinosaurs to survive in the Southwestern U.S. The fossil displayed here is an adolescent.

<<Proceed halfway up the stairs to "Cenozoic Arizona Mountain". >>

26. Mammals became the dominant organisms in the Cenozoic Era. One Cenozoic mammal, *Glyptotherium*, was an _____-like creature that first appeared in Arizona and Texas during the _____ epoch.

27. The _____, a member of the *Dromeosaur* family, had four winged limbs and flew like a _____.

<<Walk back toward the main lobby/entrance area. >>

28. In addition to mammals and birds, "flight" (gliding) is also seen in modern-day reptiles like the _____, found in southeast Asia.

Museum area 1/Main Lobby on the front page map

29. The giant toothy jaw you just walked under is from the gigantic _____, an ancestor of the modern-day Great White Shark.

30. The mammoth and pliomastadon are relatives of the modern-day African and Indian _____.