Historical Geology Lab (Answer in sentences where appropriate.) **Name** _____

– – – – – – – – – – PART 1 - THE GEOLOGIC RECORD – – – – – – – – – –

Link1 - Excellent & Challenging: https://www.geosociety.org/documents/gsa/timescale/timescl.pdf
Link 2 - Intermediate: https://en.wikipedia.org/wiki/Geologic_time_scale
Link 3 - Simple: http://2.bp.blogspot.com/-a3MarOc3cPU/UTcx6GJwntI/AAAAAAAABhc/78-LGrK5_40/s1600/Geological+Time-scale.bmp
Link 4 - Simple 2: Geologic Time 1
Link 5 - Simple 3: Geologic Time 2

A. Using the links above, complete the table below.
A) List the four ERAS of geologic history,
B) List the PERIODS in each ERA,
C) List the MYA - years covered for each, and
D) Record something interesting from the rock record regarding major geologic events or life forms.

A) ERA	***B) MYA/Ma***	***C) PERIOD***	***D) GEOLOGIC RECORD/LIFE FORMS***
CENOZOIC	0 - 1		
			(For Cenozoic periods, use the 1st link)
	63-135		
		JURASSIC	
		PENNSYLVANIAN	*(For MYA/Ma, use the 2nd link. Pennsylvanian*
		MISSISSIPPIAN	& *Mississippian often are combined into 1 unit.)*
PRECAMBRIAN		PROTEROZOIC	
	4,450	ARCHAEOZOIC	*THE PROFESSOR IS BORN*

– – – – – – – PART 2 - GEOLOGIC CROSS SECTION OF THE GRAND - SAN FRANCISCO PEAKS - VERDE VALLEY REGION – – – – – – –

Use the provided poster or use this link -> A) http://softpath.org/GLG/Labs/CrossSectA.jpg

1. The lowest elevation on the poster is about _____' at _____; the highest is _____' at _____

2. In which direction are *you* looking in this poster? _____ This means Phoenix is to the right/left. (Circle one.)

3. What large geologic event might have helped form the Verde Valley? _____

4. Which direction did the south side of the fault move, up or down? _____

C. Look at legend on the bottom of the map.

5. The oldest rocks on this cross-section are the _____, at least _____ years old.

6. *Besides* the lavas or the Verde Formation, the youngest rocks *formations/layers* in *this* cross section are from the _____ era and include the _____ _____

7. Look around. What might have caused the Mogollon Rim to start forming and erode back to the north? Explain.

D. Find Red Butte, 7324' elevation. Note that is is topped with something not labelled, but look around at the SF Peaks.

8. The two *sedimentary* formations under the lava in Red Butte include _____ & _____ from the _____ period of the _____ era & are about _____ years old. The top layer is _____ from the _____ period of the _____ era & is about _____ years old.

E. Find the same Red Butte layers under the San Francisco Peaks.

9. How could you explain the same rock formations in 2 different places? Did they form two separate places at the same time?

10. Which formed *last*, all those sedimentary layers or the lava flows and craters? Explain, please.

F. Travel up to the Grand Canyon. Pay your entry fee. Thank the ranger. Pick up litter. Don't pet the squirrels.

11. The only two geologic eras found at the Grand Canyon are the _____ & _____.

12. The age of the *most recent* rock at the Grand Canyon is about _____ years old. (See handy link below.)

13. Why are there no recent rocks at the Canyon? What is going on? What could have caused that? (Think where sed rocks form.)

14. The oldest rocks at the Grand Canyon are found _____(where) & are named the _____ and _____ at _____ years of age.

15. Most hikers in the canyon never see the Hakatai, or Dox formations. Why?

16. Describe at least three events that must have happened between the Dox and Tapeats.

A)

B)

C)

G. Flip the poster over or go to http://softpath.org/GLG/Labs/CrossSectB.jpg

17. In Northern Arizona are the Vermillion Cliffs. What might have caused this escarpment (cliff) formation?

H. Find Zion Canyon.

18. Are the rocks in Zion the same as the ones in the Grand Canyon? How do you know?

19. Might rocks from the Zion and Grand Canyons *look* similar? Explain.

20. Besides being sandstone and rocks in in the SW and on Earth, what do the Coconino and Navajo Sandstones have in common?

21. At Cedar Breaks, there now are rocks from the two most recent *eras*, the _____ & the _____

— — — — — — — — — — PART 3 - GEOLOGIC MAP OF ARIZONA — — — — — — — — — —

I. Go to http://data.azgs.az.gov/geologic-map-of-arizona/# Zoom to the Grand Canyon. Click on the baby blue rock on the rim. (Aww… baby! Too cute!) Read the small window that pops up in the upper right corner of your computer screen.

22. Does the information in the popup window agree with the information you found on the poster? Explain.

J. Wander around northern Arizona. Really. Wander Have fun. Be curious. Click. Explore. Play.

23. Tell two things you discovered in your exploration of Northern Arizona.

A)

B)

K. It is getting late. Let's head back to Phoenix. Go to the intersection of 7th Street and Cactus/T-Bird. Zoom in. Look at both the pink and greenish areas adjacent to each other.

24. A) What is up with the pink layer? What is it? B) In the real world (not on the map) considering the type of rock here, what color would you expect those mountains to be? (Think. You probably have driven by this corner many times.)

A)

B)

L. Click on the tan and yellow-tan layers, Qy and Qm. Read about them.

25. Tell two things these two formations have in common.

A)

B)

26. Would these two formations be a solid surface good for building on in an earthquake zone? Why?

27. Is that a concern in Phoenix? Explain.

M. Move to 16th Street and the 101. Please watch for large semi trucks. Don't let your typing fingers get run over. Find the brown Xg rocks. Read about them. You now can see why I just lump granite-like rocks together in the lab.

28. Tell two interesting things about Xg.

A)

B)

N. Look at the green Xmv.

29. Would you expect to find nice crystals of quartz, feldspar, and mica in here as with the Xg? Why/Why not?

Summary. Describe two geologic things you learned or include questions you still have or that I should have asked.

A.

B.