

Name: _____ Date: _____ Per: _____

Chapter 26 Review: The Tree of Life

1. What is the primordial or primitive soup mentioned? Remind yourself of Miller-Urey here (back from Chapter 4). What types of conditions were needed on early Earth for this soup to form?
2. What roles did meteors play in sourcing organic compounds? How else is the solar system providing clues for the Origin of Earth?
3. There are several hypotheses about the natural origin of life on Earth, each with supporting scientific evidence. Describe these theories and give the evidence supporting them. (mention the above hypotheses briefly, and include polymers, protobionts, RNA, ribozymes, and natural selection).
4. How are rocks and fossils dated? Give examples of radiometric dating, half-lives, etc. What are magnetic reversals and how do they affect the fossil record?
5. The geological record is on page 519. Know the eons and the eras and their relative time frames (Archaean is oldest, etc.). Know what is Precambrian and why the Cambrian explosion is so important. Check out that clock analogy in Fig. 26.10. Humans really are new in the scheme of things, aren't we? Crazy how much impact we've had in so little time.
6. Briefly run through the 2 mass extinctions mentioned in the book **and** give the evidence for their existence. (FYI-there are 5 total accepted mass extinction events. Many scientists now point to a 6th mass extinction event that is currently happening due to the proliferation of humans leading to climate change.)
7. What are the oldest known fossils? How old? What did these stromatolites suggest about the evolution of prokaryotes? What were the first prokaryotes like?
8. Explore the evidence surrounding ETC (ATP production) and photosynthesis theories. Where did our oxygenated atmosphere come from? Why was this so important to some life forms and harmful to others?
9. Check your clock on page 523. How did the first eukaryotes evolve? Sketch out the mitochondria and plasmid endosymbiosis model in Fig. 26.13. Explain your sketch. What role did transposable elements play in this endosymbiosis?
10. Explain the chimera connection between prokaryotes and eukaryotes. What is genetic annealing? (Hey look, UIUC!)
11. In terms of the origin of multicellular eukaryotes, discuss the snowball Earth hypothesis. What is the colonial connection? Be sure to walk through *Nostoc* and how its heterocysts support this idea.
12. So now comes the Cambrian Explosion/Radiation. Run through its importance again and its "long fuse".
13. And then Earth is colonized on land by macroscopic (not micro!) plants, fungi, and animals. How did these species evolve? Did they crawl out of the ocean in a day? Give some evidence!
14. Talk about the continental drift sagas. Draw that Pangaea! Hey look! Placentals vs. marsupials!
15. Note that my high school textbook had no mention of domains. We followed Whittaker's 5-kingdom system on page. 529. What's new? How does the new incorporate the old? Carl Woese! Lastly, check out that phylogenetic tree on 530-531. How so is this just a hypothesis?