**History of Life and Systematics Study Guide**

* To be filled out while you view the lecture and read your associated text.

1. The earth is approximately \_\_\_\_\_\_\_\_\_\_\_\_ years old, and life did not appear on the planet until \_\_\_\_\_\_\_\_\_\_\_\_ years ago.
2. Describe the landscape of earth its first billion years or so.
3. What chemical process occurred that set the stage for the beginning of life? (I.e. what molecule and in what form is required to sustain all life?)
4. The two main types of cells are classified as \_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_.

Which one as the first to evolve and what was their most likely form of energy acquisition?

1. \_\_\_\_\_\_\_\_\_\_\_\_is the process that started putting massive amounts of oxygen into the atmosphere. This period in earth’s history is sometimes referred to as the \_\_\_\_\_\_\_\_\_\_\_\_.
2. In your own words, explain what the endosymbiont hypothesis is and how it explains the evolution of eukaryotic cells.
3. What are some challenges that organisms had to overcome to successfully complete the invasion of land?
4. Name the Three Domains of life: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Which Domain are all animals grouped in?
6. Outline the basic progression of life as it appeared throughout history. You may want to draw a diagram.
7. Taxonomy is the study within biology that \_\_\_\_\_\_\_\_\_\_\_\_ & classifies species.
8. What was Carl Linnaeus’ contribution to the field of taxonomy?
9. Can you come up with your own pneumonic device to remember order of taxonomic category?
10. Which two taxonomic categories i.e. levels of classification above are used in the naming of a species?
11. On slide 9 of the lecture material there are several plants with their taxonomic rankings. Which two are the most closely related and which are most distantly related?
12. In the context of binomial nomenclature, bi means “two” and nomial is derived from the root word nominal which means “pertaining to a name.”  How is the human being named?  Write that form here \_\_\_\_\_\_\_\_\_\_\_   \_\_\_\_\_\_\_\_\_\_\_\_\_\_
13. Give an example of how the dog rose is written. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
14. Fill in the blanks in the nested system of classification from the most general to the most specific.
    1. Domain 🡨Most inclusive
    2. Kingdom
    3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    4. Class
    5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    6. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    7. Genus
    8. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 🡨Least Inclusive, most exclusive
15. The characteristics that are used to identify and classify an organism include the following:
    1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - which means shape of (or study of form).
    2. Symmetry – which may be radial or bilateral, in the case of animals.
    3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - how an organism changes as it matures.
    4. Modes of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, such as carnivory, autotrophic etc.
    5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ such as nest building, calls/songs, and mating rituals
    6. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which means unique traits not seen in other organisms.  
       > An example of the above would be \_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the case of mammals or \_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the case of birds (think about body coverings).
16. What is the role of ***phylogeny***?
17. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the method that demonstrates evolutionary relationships by grouping species on the basis of \_\_\_\_\_\_\_\_\_\_\_\_\_, quantifiable features/traits.
18. What is the difference between bacteria & Archaea? (Hint: you may need to examine this information in your textbook, we don't normally see or work with the Archaeans.)
19. How does a cladogram differ from a phylogeny?
20. In the example cladogram on slide 12, which group of organisms has all five traits that occur in the cladogram?

**Terms to Master from the Text:**  
Eukaryote, prokaryote, endosymbiont hypothesis, oxygen holocaust, ancestral, derived, shared characteristic, outgroup, node, stem reptile, radial, bilateral, exoskeleton, internal skeleton, taxon.