**Study Guide for U1 Introduction to AP Biology / U2 Evolution & Phylogeny**

1. Know the components of a controlled experiment.
2. Know how to write a null hypothesis.
3. Know the significance of standard error of the mean and standard deviation.
4. Know how to create a bar graph showing SE and S.
5. What should a scientist do with “outliers” in a data set?
6. Know the difference between positive and negative feedback, including examples.
7. Understand why evolution is a central theme in AP Biology.
8. Understand the process of natural selection.
9. Know what artificial selection is.
10. Know the difference between homologous and analogous structures and how they are used to determine evolutionary relationships. Recognize examples of each.
11. Know evidences that support a common origin to all life on Earth.
12. What are paralogous genes and pseudogenes?
13. Know how to interpret a phylogenetic tree.
    1. Understand extant and extinct species
    2. Be able to identify a recent common ancestor
14. Understand what Hardy-Weinberg Equilibrium is, the 5 conditions that must be met, and be able to solve problems.
15. Be familiar with the sickle cell trait.
16. Understand what the heterozygote advantage is.
17. Know what sexual selection and sexual dimorphism are.
18. Differentiate between stabilizing, directional, and disruptive selection.
19. Understand causes of gene flow.
20. Know what the founder effect, bottleneck effect, and genetic drift are.
21. Differentiate between allopatric and sympatric speciation.
22. Know what diploidy is.
23. Know the difference between gradualism and punctuated equilibrium. How are these two represented in a phylogenetic tree?
24. Know what pre-zygotic, post-zygotic reproductive barriers, and hybrid zones are.
25. Understand the endosymbiont theory and evidences that support it.
26. Know characteristics of:
    1. The first cells
    2. The first terrestrial organisms
27. Know the probably sequence in the evolution of life on land.
28. Know what homeotic genes are and why they are important.
29. Understand what a molecular clock is.
30. Know how to create and analyze a phylogenetic tree or cladogram