

Bio I Adv. Ch 13 & 14 Evolution Objectives

1. Define these terms:

evolution	Natural selection-	Adaptation	Homologous structures
population	gene pool	microevolution	analogous structures
Sympatric speciation	Macroevolution	Variation	Vestigial structures-
2. List six evidences that evolution occurs in organisms. For each evidence, describe how it supports the theory that species change over time.
3. State the Hardy-Weinberg Theory. List five conditions necessary to maintain Hardy-Weinberg equilibrium.
4. a. Assuming that a gene exists which has two alleles, one completely dominant (B) over the other (b), explain which genotypes can and which can not be determined by observing the phenotype of an individual.
b. Write an equation for frequency of alleles in the gene pool. Include a key.
c. Write an equation for frequency of genotypes in the population.
5. In a population, 1% of the individuals have a disease caused by a homozygous recessive genotype. Calculate the genotype frequencies for the population. Show work.
6. Describe the evolutionary mechanism of natural selection. Include a discussion of how variation followed by a reduction in variation leads to change in population.
7. Describe three sources of variation in a population. Which provides genes *de novo*?
8. Define each of the following. For each, describe how it can increase or decrease variation in a population.

Gene flow	Genetic drift	Founder effect	Genetic bottleneck
sexual selection	frequency dependent selection	Heterozygote advantage	
9. Define and include an example of *divergent evolution*, and *convergent evolution*
10. Differentiate between *stabilizing selection*, *directional selection*, *disruptive selection*. Be able to identify examples of each.
11. Define *speciation*.
12. Define and differentiate between biological, morphological, ecological, and phylogenetic concepts of species.
13. Differentiate between prezygotic and postzygotic reproductive barriers between species. Give examples of each. Be able to recognize more examples.
14. Explain how geographic isolation followed by reproductive isolation leads to speciation.
15. Describe adaptive radiation. Cite some examples of adaptive radiation and explain how they might have occurred.
16. Differentiate between the *gradualistic* and *punctuated equilibrium* models of the pace of evolution.
17. Describe how a complex feature in an organism could arise in stages. How does exaptation play a role in this?
18. Discuss one misconception some people have about evolutionary theory. Explain how your ideas about it have been modified by studying biology.