

AP Biology**TEXT: *Biology, Campbell and Reece*****7th Edition****Chapter 23 – The Evolution of Populations
Guided Reading**

1. What is the smallest unit of evolution? Why is this important to understand?

2. Define the following terms:
 - a. Microevolution

 - b. Population

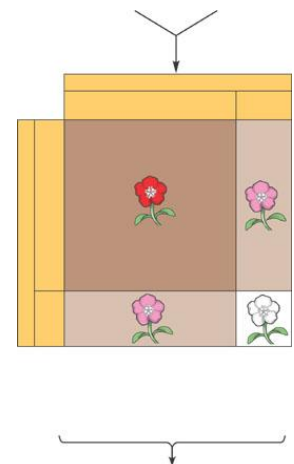
 - c. Population genetics

 - d. Gene pool

3. What is the Hardy-Weinberg Theorem? Why does it appear to be an apparent contradiction to evolution?

4. What is Hardy-Weinberg equilibrium?

5. Use the blank diagram to relate the H-W equation to a Punnett square.



6. What are the five conditions for H-W equilibrium to be maintained?

7. How can the H-W equation be used today in terms of human health?

8. What are the two broad processes that make evolution possible?

9. Describe the impact of the following:
 - a. Point mutation

 - b. Gene duplication

 - c. Sexual recombination

10. What is the relationship between mutation rates and generation span?

11. Define the following processes:
 - a. Genetic drift

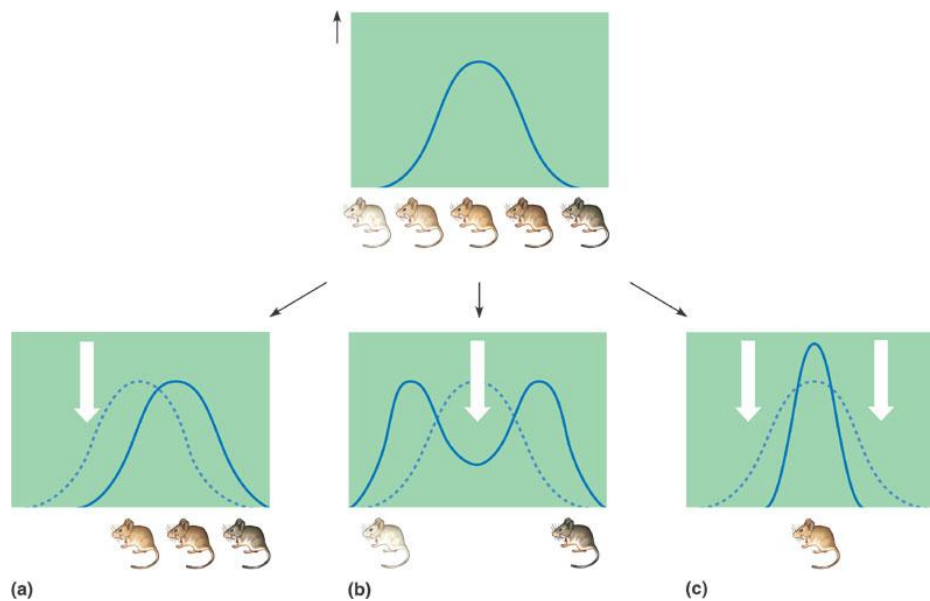
 - b. Bottleneck effect

 - c. Founder effect

 - d. Gene flow

12. Why is a discussion of adaptive evolution necessary? What role does natural selection play in this important process?

13. Give examples of phenotypical variation that is NOT inheritable.
14. Explain the terms **phenotypic polymorphism** and **genetic polymorphism** in common terms and relying on examples from your own experience.
15. How do we measure genetic variation?
16. How can very small differences in nucleotide sequences lead to such diversity in the human population?
17. What is geographic variation and how does the term "**cline**" relate to this process?
18. What is different about the terms **fitness** and **relative fitness**?
19. Why is it said that evolution acts on phenotypes and not genotypes?
20. Use the diagram below to differentiate between the modes of selection.



21. Why does diploidy **preserve** genetic variation?
22. How does balancing natural selection relate to the term balanced polymorphism?
23. Define and give an example of the following terms:
- Heterozygote advantage
 - Frequency dependent selection
 - Neutral variation
 - Sexual dimorphism
 - Intrasexual selection
 - Intersexual selection
24. What are the limitations to Natural Selection?
25. **Complete text Investigation 23.1 “How can the frequency of alleles be calculated?” found on disc or through online text under Concept 23.1 heading – type your completed data table with headings and answer questions 1-4 of the activity using complete sentences that EXPRESS a complete thought. This means that a sentence “the number is....” Would be unacceptable because it does not stand alone.**