**Unit 7: Evolution**  Chapter 10: The Principles of Evolution

Study Guide Chapter 11: The Evolution of Populations

Chapter 12: The History of Life

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| **SB4. Obtain, evaluate, and communicate information to illustrate the organization of interacting systems within single-celled and multi-celled organisms.**  *a. Construct an argument supported by scientific information to explain patterns in structures and function among clade of organisms, including the origin of eukaryotes by endosymbiosis.*  *b. Analyze and interpret data to develop models (i.e., cladograms and phylogenetic trees) based on patterns of common ancestry and the theory of evolution to determine relationships among major groups of organisms.*  **SB6. Obtain, evaluate, and communicate information to assess the theory of evolution.**  *a. Construct an explanation of how new understandings of Earth’s history, the emergence of new species from pre-existing species, and our understanding of genetics have influenced our understanding of biology.*  *b. Analyze and interpret data to explain patterns in biodiversity that result from speciation.*  *c. Construct an argument using valid and reliable sources to support the claim that evidence from comparative morphology (analogous vs. homologous structures) embryology, biochemistry (protein sequence) and genetics supports the theory that all living organisms are related by way of common descent.*  *d. Develop and use mathematical models to support explanations of how undirected genetic changes in natural selection and genetic drift have led to changes in populations of organisms.*  *e. Develop a model to explain the role natural selection plays in causing biological resistance (e.g., pesticides, antibiotic resistance, and influenza vaccines).* |
| 1. Who is Lamarck and what was his theory? Why was it incorrect? 2. Who is Darwin and what was his theory? 3. What causes new traits to evolve? 4. What is adaptive radiation? What is an example that Darwin referred to? 5. If a mutation is introduced into a population, what factor would determine whether the frequency of that allele (mutation) will increase? 6. What combination of characteristics would lead to the greatest potential for evolutionary change? (circle one)  * small population with many mutations * small population with few mutations * large population with many mutations * large population with few mutations  1. What is an adaptation? Give an example of a physical and a behavioral adaptation. 2. What is fitness? 3. Explain the phrase “Natural selection is the mechanism for evolution”. 4. What does “Survival of the Fittest” mean? Include fitness and adaptation into your answer. 5. What is camouflage and how does it benefit the survival of the species? 6. How does mimicry benefit the survival of a species and give an example?      1. **Explain how Kettlewell’s experiment with moths in sooty (dark) forests and non-sooty (light) forests demonstrates natural selection and explain which of the 3 types it represents** 2. What is a gene pool? 3. What is gene flow? Describe the types below.  * Bottleneck Effect: * Founder Effect: * Emigration: * Immigration:  1. How does convergent evolution lead to analogous structures? Give an example and explain. 2. What is coevolution? Give an example and explain. 3. What are homologous structures? Give an example. 4. What are analogous structures? Give an example. 5. What are vestigial structures? Give an example. 6. What is the difference between ancestral and derived traits. 7. How do fossils provide evidence for evolution? 8. What types of rocks are fossils formed in and why? 9. **Describe** the 3 types of natural selection, give an example and **sketch** the graph for each.  |  |  |  | | --- | --- | --- | | **Directional Selection** | **Stabilizing Selection** | **Disruptive Selection** | |  |  |  | |  |  |  | |  |  |  |  1. What is Pre-zygotic isolation? Describe the 4 types.  * Temporal: * Geographical: * Ecological: * Behavioral  1. What is Post-zygotic isolation? How does this lead to hybrid sterility? 2. How do bacteria develop resistance to antibiotics? 3. How could antibiotic resistance become a problem for humans? 4. How do insects develop resistance to pesticides? 5. How could pesticide resistance become a problem for farmers? |

**What should I use to study for my test?**

* *Powerpoint notes*
* *This study guide*
* *Videos posted on the blog*
* *Online textbook*