**Study Guide for Unit 8 Test**

General Biology

May 11, 2016

Chapters 10.1-10.4, 11.1 &11.3, 11.5-11.6, 12.4, 17.1-17.2, and 17.4

**Unit 8: Evolution & Natural Selection**

**Chapter 10: Principles of Evolution**

1. **Theory of Evolution** (definition & how these theories were developed)
   1. **Observations Darwin made on the *Beagle***
   2. **Artificial Selection** (definition & its role in Darwin’s theories)
2. **Natural Selection** (be able to define, explain, and apply this theory)
   1. **Descent with Modification** (pertaining to Natural Selection)
   2. **4 main principles of Natural Selection**
      1. Be able to define **Variation**, **Adaptation**, and **Heritability**
   3. **Biological Fitness** (definition & explanations of populations over time)
   4. **Environmental Changes** (and their influence on a population)
   5. **Explain why natural selection doesn’t lead to “perfect organisms”**
3. **Evidence for Evolution** (name, describe, and give examples of the types of evidence)
   1. **Fossil Record**
   2. **Biogeography**
   3. **Embryology**
   4. **Homologous Structures**
      1. **Analogous Structures** (explain how these are NOT evidence of evolution)
   5. **Vestigial Structures**
   6. **Molecular Biology / DNA**

**Chapter 11: The Evolution of Populations**

1. **Genetic Variation** (definition and significance within a population)
   1. **Two main sources of new genetic variation**
2. **Evolution without Natural Selection** (explain how other events can occur to change allele frequencies)
   1. **Allele Frequency** (definition)
   2. **Gene Flow**
   3. **Genetic Drift** (definition, two main types, and examples of each)
   4. **Sexual Selection**
3. **Speciation** (define **Species** and explain the three types of isolation that lead to speciation)
   1. **Isolation** (define and give examples of all three types)
4. **Patterns and Rates of Evolution and Extinction**
   1. **Extinction** (define and distinguish between background and mass extinction)
   2. **Convergent vs. Divergent Evolution** (explain differences and relate to homologous/analogous structures)
   3. **Coevolution** (definition and examples)
   4. **Punctuated Equilibrium vs. Gradualism** (distinguish between the two)
5. **Adaptive Radiation** (define and explain)

**Chapter 12: The History of Life**

1. **Endosymbiosis** (explain the evolution of eukaryotic cells)

**Chapter 17: The Tree of Life**

1. **Classification of Organisms (Taxonomy)** (why it is necessary & why it has changed throughout history)
   1. **Binomial Nomenclature** (proper usage & what the two names mean)
2. **Cladogram** (explain purpose, understand how to create, & read cladograms to determine relationships)
3. **Domains** (name & describe the three domains: **Bacteria**, **Archaea**, and **Eukarya**)