**Biology Semester 1 Final Exam Study Guide**

Be sure to review all notes and activities that were completed throughout the semester.

**Evolution Part 1 (Natural Selection, Types of Natural Selection, Mechanisms for Evolution)**

1. Use the peppered moth simulation activity to explain how a population of moths can changed over time.
2. How do biologists define evolution?
3. How do biologists define natural selection?
4. What are the 4 steps for natural selection according to Darwin? Explain each one.
5. Explain what variation is. Where do variations come from in a population?
6. Why is variation important in a population?
7. Explain and graph the difference between the 3 types of natural selection.
8. If given data, be able to graph, interpret and explain which type of natural selection is occurring.
9. Identify the 5 mechanisms for evolution.
10. Explain the 5 mechanisms for evolution – why does each one cause evolution?
11. Why is genetic drift a mechanism for evolution?
12. When will a population undergo evolution the fastest?
13. What is genetic equilibrium? When is a population not in genetic equilibrium?

**Evolution Part 2 (Evidence for Evolution, Cladograms, Convergent/Divergent/Coevolution, Speciation)**

1. What are the pieces of evidence for evolution? And be able to explain each one.
2. What is the difference between homologous and analogous structures?
3. Give an example of a vestigial structure and explain why it is considered vestigial.
4. Why is DNA considered evidence for evolution?
5. Why are whales an important organism when studying evolution? What traits do they have or don’t have that is crucial to show evolution has occurred?
6. What is the difference between convergent and divergent evolution?
7. Explain what coevolution is.
8. What is reproductive isolation? How can organisms become reproductively isolated?
9. Distinguish between allopatric and sympatric speciation.
10. Explain what speciation is.
11. Know how to read and create cladograms that show evolutionary relationships among organisms.

**Ecosystems (Abiotic vs Biotic, Energy Flow, Food Chains/Webs, Energy Pyramids, Biomagnification, Population Graphs, Symbiosis, Succession)**

1. Distinguish between abiotic and biotic factors and give 3 examples of each.
2. Define: producer, primary consumer, secondary consumer, tertiary consumer, autotroph, heterotroph.
3. Be able to read a food chain/web.
4. What is the role of decomposers in an ecosystem?
5. How much energy is able to be passed from one trophic level to the next?
6. Explain biomagnification, what organisms are affected the most?
7. Compare and contrast exponential and logistic growth.
8. What is carrying capacity? Why do logistic growth graphs reach a carrying capacity?
9. What are the 3 types of symbiosis? Define and give an example of each.
10. How are primary and secondary succession different from one another?
11. How would one be able to determine if primary or secondary succession is occurring?