**Kickoff# 16 (3-25-15): Chapter 16**

1. Please explain the scientific theory of evolution in your own words.

Answers will vary. The theory is based on how variation in traits cause species to adapt to their environments when those traits are selected for by an environment or selective pressure from an environment (i.e. predation, temperature, amount of rainfall, etc.)

1. What is the difference between artificial and natural selection

Artificial Selection is when human selection through selective breeding causes organisms to display preferred characteristics that are selected for by humans.

Natural selection is when selective pressures from an environment select for adaptations/variation that confers an advantage to the individuals in a population for a given environment, therefore giving individuals better fitness in the environment compared to the individuals that do not have the adaptation or trait.

1. What was Lamarck’s Hypothesis and explain why it was incorrect.

Lamarck’s Hypotheses were not altogether correct in that he stated that organisms evolve to become more ”perfect”. This is not how evolution works. We are not evolving into more perfect organisms. In Evolution adaptations are selected for that give advantage and improved fitness to organisms in an environment, however environments are always changing…so traits that give improved fitness at one point in time may not when the environment changes.

1. What were Malthus’ views regarding human population growth?

Malthus reasoned that human population was increasing and eventually, if it continued to increase unchecked there wouldn’t be enough food and living space. He reasoned that these factors would contribute to increased chances for war, famine and disease.

1. Explain the concept of fitness as it relates to adaptations in one complex sentence.

Fitness is a term that refers to an individual’s ability to survive and reproduce more successfully than another organism in a given environment due to traits (phenotypes) that the organism has that are selected for. We contrast this with varied traits other organisms have that are less fit because natural selection selects against them due to different traits.

**Kickoff# 17 (3-26-15): Chapter 16**

1. Please explain evolution in terms of Humans and the Great Apes using the term common descent.

Humans and Great Apes share a common ancestor from which both lineages evolved. The theory of evolution does not claim that humans evolved from apes!

1. What is biogeography?

Biogeography is the study of the distribution of species geographically over time. Simply put it is the study of where organisms live at different periods of time.

1. Explain the difference between homologous structures and analogous structures citing examples for each.

Homologous structures evolve from the same structure in a common ancestor and may not have the same function in each of the different line of descendants of the common ancestor. ie. limb bones in walrus and human

Analogous structures evolve in organisms without common ancestors to have the same function. ie. covering of wings with feathers (in birds/aves) and fur/skin (in bats/mammals)

1. What is a vestigial structure?

A vestigial structure is one which does not have a fnction in a descendant but once did in its ancestor.

**Kickoff# 18 (3-27-15): Chapter 17**

1. Please explain the concept of a gene pool using the terms individuals, populations, and allele frequencies.

A gene pool is the sum total of genes/alleles in all individuals in a given population. Different alleles in the gene pool have different frequencies or proportions. We tend to find allele frequencies increase when the allele is selected for by natural selection due to increased fitness and reproduction of organisms that have the beneficial allele.

1. What are three sources of Genetic Variation in a population.

Three sources of genetic variation in a population are: Mutations, genetic recombination in sexual reproduction (remember meiosis, crossing over and law of independent assortment!) and lateral gene transfer (mainly in and between bacteria)

1. Explain the difference between single gene traits and polygenic traits.

Single gene traits are traits controlled by a single gene. Polygenic traits are composed by more than one gene and numerous alleles (ie. skin color controlled by three genes)

1. Draw a graph for each of the three types of selection (Directional, Stabilizing and Disruptive) and give a short explanation

Please see the graphs on page 489 of your textbook for a description and example of graphs for each of the three types of selection.