**Pre-AP Evolution Test Review**

*Refer to the following questions and vocabulary to help you to review for the test.*

* Required vocabulary: theory, law, population, allele, gene pool, allele frequencies, relative frequency, single/polygenic gene trait, species, phenotype, genotype, gene flow, genetic drift, fitness, biodiversity, adaptations, artificial/natural selection, , vestigial, homologous, transitional forms, index fossils, relative dating, radioactive/ radiometric dating, anatomical structures, isolation, speciation, adaptive radiation, allopatric speciation, convergent/divergent evolution, reproductive isolation, gradualism/ punctuated equilibrium, macroevolution, microevolution, coevolution, bottleneck effect, genetic equilibrium, and founder effect
* What is a theory?
  + How is a theory different from a hypothesis?
  + How is a theory different from a law?
* What is evolution?
  + Do individuals or populations evolve?
  + Why is evolution a scientific theory?
  + What is the evidence that supports evolution?
    - Describe how each supports evolution.
      * What are transitional forms of fossils?
      * What are index fossils?
      * What is radioactive/radiometric dating?
        + How is radioactive/ radiometric dating used to support evolution?
      * What is relative dating?
        + How is relative dating used to support evolution?
      * What is the biochemical evidence for evolution?
        + How does this aid in the theory of evolution?
      * What is embryology?
        + How does embryology aid in the theory of evolution?
      * What are homologous structures?
        + How do homologous structures aid in the theory of evolution?
        + Do homologous structures indicate the organisms share a more recent or distant common ancestor?
        + Are homologous structures indicative of divergent or convergent evolution?
        + List examples of homologous structures
      * What are analogous structures?
        + How do analogous structures aid in the theory of evolution?
        + Do analogous structures indicate the organisms share a more recent or distant common ancestor?
        + Are analogous structures indicative of divergent or convergent evolution?
        + List examples of analogous structures
      * What are vestigial structures?
        + How do vestigial structures aid in the theory of evolution?
        + List examples of vestigial structures
* What is artificial selection?
  + How is natural variation used in artificial selection?
* What is an adaptation?
  + What are the types of adaptations?
* What are the sources of genetic variation?
* Briefly describe the principle of common descent.
* What is fitness?
  + How is fitness affected by natural selection?
* What is natural selection?
  + How does natural selection work?
  + How is natural variation used in natural selection?
* What is sexual selection?
  + Give an example
* How is evolution defined in genetic terms?
  + What is a gene pool?
    - How are allele frequencies related to gene pools?
    - What is relative frequency?
* What determines the numbers of phenotypes for a given trait?
* How does the range of phenotypes differ between single-gene traits and polygenic traits?
  + How does natural selection affect single gene traits?
    - Define single gene trait
      * Provide one example
  + How does natural selection affect polygenic traits?
    - Define polygenic traits.
      * Provide one example.
    - Differentiate between directional, stabilizing, and disruptive selection.
      * Draw an example of each.
      * Which two forms of selection lead to two distinct phenotypes?
* What is genetic drift?
  + What is the size of the population that is affected?
  + How does genetic drift lead to a change in a population’s gene pool?
  + Does genetic drift increase or decrease genetic diversity?
  + Is this change in allele frequencies due to natural selection, artificial selection, sexual selection, or by chance?
  + How is genetic drift related to the founder effect?
    - Give an example of the founder effect.
  + What is the bottleneck effect?
    - Give an example.
* List the patterns of macroevolution
  + What is adaptive radiation or divergent evolution?
    - Give an example.
  + What is coevolution?
    - Give an example.
  + What is convergent radiation?
    - Give an example.
* How does gradualism differ from punctuated equilibrium?
* How does macroevolution differ from microevolution?
* What is genetic equilibrium?
  + Briefly describe the Hardy-Weinberg principle.
  + What is the formula for the Hardy-Weinberg principle?
  + Be able to calculate the frequency of alleles in a population. For example, if the frequency of AA = 85%, what is the frequency of the a allele?
  + What five conditions are needed to maintain genetic equilibrium?
* What is reproductive isolation?
  + What is a species?
  + What is speciation?
    - What factors are involved in the formation of a new species?
  + List and briefly differentiate between the four types of isolating mechanisms.
    - What is allopatric speciation?
  + Describe the process of speciation in the Galapagos finches.
    - What type of natural selection did the Grants observe in the Galapagos?