Unit 7 Genetics
Top 10

1. Mendelian Genetics
    a. Process by which Mendel conducted his experiments.
    b. How does Mendel's work demonstrate support for the concepts of dominant and recessive alleles?
    c. Compare and contrast the terms:
        1. genotype and phenotype
        2. heterozygous and homozygous.
    d. Purpose of a test cross. How is it conducted?

2. Beyond Mendel
    a. Explain each of the following phenomena and how they extend our understanding of genetics from the work done by Gregor Mendel and classical Mendelian inheritance patterns. Provide a real-world example of each:
        1. Incomplete Dominance
        2. Co-Dominance
        3. Pleiotropy
        4. Epistasis
        5. Polygenic Inheritance
        6. Sex Linkage
        7. Gene linkage

3. Chromosomal Theory of Inheritance
    a. Explain the events in meiosis that explain the law of segregation and the law of independent assortment.

4. Linked Genes
    a. How was sex-linkage discovered?
    b. Linked genes are usually inherited together, but not always. What circumstances can "unlink" genes?
    c. How and why can linked genes be used to map the locations of genes on chromosomes?

5. Chromosomal Abnormalties
    a. Define "non-disjunction". Why can this be a problem during meiosis?
    b. How is Down's Syndrome diagnosed?
    c. Why is having an extra Chromosome 21 tolerable to the point that someone with this condition can survive to maturity?
    d. Compare and contrast the following chromosomal syndromes:
        1. Kleinfelter's Syndrome
        2. Jacob's Syndrome
        3. Trisomy X

        4. Turner's Syndrome
    e. Explain what happens during each of the following chromosomal mutations:
        1. Deletion
        2. Duplication
        3. Inversion
        4. Translocation

6. Human Genetic Disorders
    a. Why are pedigrees useful for tracking the inheritance of diseases and other traits?
    b. Determine modes of inheritance based on pedigrees.
    c. Explain the mode of inheritance (autosomal dominant, autosomal recessive, sex-linked, sex-limited), the cause, and the symptoms of each of the following genetic conditions:
        1. Cystic Fibrosis
        2. Tay-Sachs Disease
        3. Sickle Cell Anemia
        4. Huntington's Chorea
        5. Hemophilia
        6. Male Pattern Baldness (NOT A DISEASE)
7. Labs
    a. Fruit fly genetics
8. Math
    a. Frequency of recombination
    b. Distance between genes
    c. Chi-squared
    d. Punnett Squares and Probability