Honors Biology – Unit 10 Objectives

1. Vocabulary: clone, diploid, haploid, n, 2n, homologous chromosomes, somatic cell, gamete, ovum, sperm, meiosis, first & second meiotic divisions, crossing-over, polar bodies, Mendel, Mendel's "factor," allele, gene, genome, monohybrid cross, parental generation, first filial, second filial, dominant, recessive, principle of segregation, principle of independent assortment, genotype, phenotype, homozygous, heterozygous, progeny, dihybrid cross, X & Y chromosomes, incomplete dominance, codominance, multiple alleles, linked genes, sex (X) linked traits, nondisjunction, multigene trait, and multifactorial.

2. Compare and contrast the processes and results of mitosis and meiosis.

3. Explain and illustrate how both meiosis and Punnett squares demonstrate Mendel's principles of segregation and independent assortment.

4. Assume the persona of Gregor Mendel. Explain to someone else in the 1860's how the data you have gathered is explained by your principles. Do not use modern vocabulary (gene, allele, chromosome, meiosis, etc.).

5. Figure probabilities, genotypic ratios, and phenotypic ratios for given genetics problems. Any type of inheritance we practiced is fair game, both as monohybrid and dihybrid crosses.

6. Given a scenario depicting crosses and phenotypic ratio evidence, determine the type of inheritance exhibited. (codominant, sex-linked, linked genes, etc.)

7. Given linkage group characteristics and the phenotypic distribution of offspring, determine parental genotypes and the distance between the linked genes expressed as a % chance for crossing over.

8. Given phenotypic frequencies in a population, use the Hardy-Weinberg equation to calculate allele frequencies and predict the number of the population that are homozygous dominant and heterozygous for the trait.