Unit 6: Genetics and Meiosis

Chapters: chapter 12, sections 15.1 and 15.2

Standards:

- HS-LS3-1 Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring
- HS-LS3-2 Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.
- HS-LS3-3 Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.

Objectives:

1. Describe the events that occur during each phase of meiosis
2. Explain how meiosis is different from mitosis
3. Describe the effects of errors in meiosis
4. Explain where an organism gets its unique characteristics from
5. Describe how many sets of genes are found in most adult organisms
6. Explain how probability can be used to predict traits
7. Explain how different forms of a gene are distributed to offspring
8. Explain how alleles segregate when more than one gene is involved
9. Explain how two alleles from different genes can be inherited together
10. Describe what Mendel contributed to our understanding of genetics
11. Describe some exceptions to Mendel's principles
12. Describe the role of the environment in how genes determine traits
13. Explain how human karyotypes are used
14. Describe what patterns of inheritance human traits follow
15. Explain how pedigrees can be used to analyze human inheritance
16. Explain how small changes in DNA affect human traits

Vocabulary:

- genetics
- fertilization
- trait
- hybrid
- gene
- allele
- principle of dominance
- segregation
- gamete
- homozygous
- heterozygous
- phenotype
- genotype
- Punnett square
- independent assortment
- incomplete dominance
- codominance
- polygenic trait
- homologous chromosomes
- diploid
- haploid
- meiosis
- cross over
- genome
- karyotype
- sex chromosome
- autosome
- sex-linked gene
- pedigree
- nondisjunction