**Biology Standard 3.2.2:** Predict offspring ratios based on a variety of inheritance patterns (including dominance, co-dominance, incomplete dominance, multiple alleles, and sex-linked traits).

| Know: | Understand: | Do: |
|---|---|---|
| ☐ Mendel's Laws<br>☐ Patterns of inheritance<br>☐ Definition of genotype and phenotype<br>☐ The vocabulary and relationship between the following terms: genetics, meiosis, punnett square, monohybrid, heterozygous, homozygous, incomplete dominance, complete dominance, codominance, sex-linked traits<br>☐ Proper tools to analyze and predict genetic results<br>☐ Examples of sex-linked traits<br>☐ Blood types<br>☐ Nondisjunction is failure of chromosomes to separate properly (Down Syndrome) | ☐ How Mendel's laws contribute to genetics and heredity<br>☐ How to setup and complete a punnett square<br>☐ How to determine genotypic and phenotypic ratios<br>☐ How an organism's phenotype could be based on its genotype<br>☐ How to identify gender and chromosomal abnormalities using a karyotype<br>☐ The difference between incomplete and codominance patterns<br>☐ How to solve inheritance problems involving different inheritance patterns<br>☐ How to interpret a pedigree<br>☐ The relationships of different inherited diseases with inheritance patterns<br>☐ How nondisjunction promotes chromosomal disorders | ☐ Summarize Mendel's Laws<br>☐ Analyze a punnett square and determine genotypic and phenotypic ratios<br>☐ Predict phenotype based on an organism's genotype<br>☐ Recognize parental genotypes given offsprings genotypes<br>☐ Identify gender and chromosomal abnormalities using a karyotype<br>☐ Recognize incomplete and codominance patterns<br>☐ Differentiate between and solve inheritance problems involving:<br>● Monohybrids<br>● Dihybrids<br>● Blood types<br>● Codominance<br>● Incomplete Dominance<br>● Sex-linked<br>☐ Discuss the following diseases/disorders:<br>● Sickle Cell Anemia<br>● Cystic Fibrosis<br>● Huntington's Disease<br>● Hemophilia<br>● Colorblindness<br>● Down Syndrome<br>☐ Explain frequencies of sex-linked traits in males vs. females<br>☐ Describe how nondisjunction promotes chromosomal disorders<br>☐ Use a pedigree |

| Academic Vocabulary | What does mastery look like? |
| --- | --- |
| Gregor Mendel<br>Genetics<br>Heredity<br>Dominant<br>Recessive<br>Allele<br>Genotype<br>Phenotype<br>Homozygous<br>Heterozygous<br>Punnett Square<br>Monohybrid Cross<br>Ratio,Dominance<br>Codominance<br>Incomplete Dominance<br>Autosomal<br>Sex Chromosome<br>Sex-linked<br>Multiple Alleles<br>Karyotype<br>Pedigree<br>Blood Types<br>Cystic Fibrosis<br>Huntington's Disease<br>Hemophilia<br>Sickle Cell Anemia<br>Colorblindness | ● Able to complete and interpret punnett squares and determine parental genotypes based on offspring ratio<br>● Interpret karyotypes<br>● Recognize a variety of intermediate patterns of inheritance (codominance and incomplete dominance)<br>● Recognize that some traits are controlled by more than one pair of genes<br>● Interpret autosomal inheritance patterns: sickle cell anemia including the relationship to malaria, cystic fibrosis (recessive) and Huntington's disease (dominant)<br>● Solve and interpret codominant crosses involving multiple alleles including blood typing problems<br>● Understand human sex chromosomes and interpret crosses involving sex-linked traits (color-blindness and hemophilia)<br>● Interpret phenotype pedigrees to identify the genotypes of individuals and the type of inheritance |

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**Review Problems:**

**Read About it:**