Unit 9: Genetics and Variation of Traits

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| **A. Demonstrates an understanding of Basic Heredity – “Mendelian” Genetics** | **LEARNING RESOURCES** | **VOCABULARY** |
| ***Students who demonstrate understanding can . . .***  A1 Explain the role of chromosomes and genes in the inheritance of traits  A2 Contrast the following DNA entities: chromosome, gene, and allele.  A3 Contrast genotype and phenotype  A4 Contrast the following genotypes: homozygous dominant, heterozygous, homozygous recessive  A5 Explain the significance of each of Mendel’s 3 Laws  A6 Predict simple dominant/recessive inheritance using punnet squares and basic principles of probability.    A7 Analyze & construct pedigrees which trace inheritance of traits through generations of a family. | See Google Classroom  text 2nd and 3rd ed.:   * Sect. 7.1-7.5   Online text:   * Sect. 10.1-10.4 | * Trait * Monogenic * Polygenic * Gene * Allele * Genotype * Phenotype * Heterozygous * Homozygous * Hybrid * Purebred * Dominant Allele * Recessive Allele * Monohybrid Cross * Dihybrid Cross |

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| **B.** Demonstrates an understanding of “Non-Mendelian” Inheritance patterns. | **LEARNING RESOURCES** | **VOCABULARY** |
| ***Students who demonstrate understanding can . . .***  B1 Contrast incompletely dominant, codominant, and sex-liked inheritance patterns.  B2 Explain the concept of multiple alleles as it applies to inheritance patterns.  B3 Explain how codominance and multiple alleles determine human blood types  B4 Predict incomplete dominance, codomininance, and sex-linked inheritance using punnet squares and basic  principles of probability.  B5 Analyze & construct pedigrees which trace inheritance of traits through generations of a family. | See Google Classroom  text 2nd and 3rd ed.:   * Sect. 7.7-7.14   Online text:   * Sect. 10.5-10.10 | * Incompletely Dominant Allele * Codominant Allele * Multiple allele trait * Sex-linked trait * Monogenic Trait * Polygenic Trait * Antigen * Antibody * Pedigree * Carrier |

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| **C Demonstrates an understanding of technological skills and applications of genetic research** | **LEARNING RESOURCES** | **VOCABULARY** |
| ***Students who demonstrate understanding can . . .***  C1 Explain what a monogenetic disease is    C2 Explain the role of mutation in monogenetic disease  C3 Be able to locate the disease in a karyotype  C4 Explain nondisjunction and its role in chromosomal abnormalities.    C5 Analyze karyotypes & interpret characteristics  CI6 Explain how a DNA fingerprint is produced using restriction enzymes and gel electrophoresis    C7 Analyze DNA fingerprints to derive conclusions  ***For Gel Electrophoresis Technique:***  <http://learn.genetics.utah.edu/content/labs/gel/> | See Google Classroom  text 2nd and 3rd ed.:   * Sect. 7.10 * Sect. 9.4   Online text:   * Sect. 10.8 * Sect. 13.3   \*Karyotyping activities:  <http://www.biology.arizona.edu/human_bio/activities/karyotyping/karyotyping.html>  <http://www.biology.iupui.edu/biocourses/N100/2k4csomaldisordersnotes.html> | * Monogenetic disease * Karyotype * Nondisjunction * DNA fingerprint |