Week 1 Meiosis and Mendelian Genetics

Learning Goal: Understand the mechanisms by which an organism’s genome is passed on to the next generation through sexual reproduction

After the pre-class assignments you should be able to:

• Define and relate the terms gene, allele, genotype, phenotype, homozygosity, and heterozygosity
• Describe, using diagrams, the sequence of events involving DNA in meiosis from chromosome duplication through chromosome segregation
• Explain how meiosis is different from mitosis
• Describe Mendel’s principle of segregation and principle of independent assortment
• Explain how independent assortment during meiosis can lead to new combinations of alleles of unlinked genes
• Describe how nondisjunction can cause variation in chromosome number between gametes

By the time you take the first midterm you should also be able to:

• Distinguish between sister chromatids and homologous chromosomes
• Calculate the probability of a particular gamete being produced from an individual, assuming independent segregation of alleles
• Predict how chromosome numbers in a gamete may vary depending on non-disjunction during meiosis