BIO 184 - PAL Problem Set Lecture 8 (Brooker Chapter 2)
Mendelian Inheritance

Section A. Purebreds and Hybrids

Before Gregor Mendel, what was the prevalent believe of the how traits were inherited?

What was the most significant conclusion that Gregor Mendel drew from his experiments with pea plants?

What is the genotype of a purebred?

How was Mendel able to perform a self-fertilization?

If over several generations a trait does not vary in a group of organisms, what can that group be called?

What is the genotype of a hybrid?

How was Mendel able to perform a cross-fertilization?

What is a monohybrid?

What is a dihybrid?

What is a trihybrid?

Section B. Mendel's experiments

Mendel's work with monohybrid crosses led directly to which law?

What is stated by Mendel's law of segregation?

What were Mendel's "assumptions"?

What aspect of chromosome behavior during mitosis or meiosis most clearly accounts for Mendel's law of segregation?

Mendel's work with two-factor crosses led directly to which law?

What is stated by Mendel's law of independent assortment?

What is meant by the phrase "empirical approach"?

Did Mendel have a hypothesis before he performed his experiments?

Section C. Predicting offspring ratios with Mendelian traits

Which genetic cross predicts a 3:1 ratio?

Which genetic cross predicts a 9:3:3:1 ratio?

Which genetic cross predicts a 1:1:1:1 ratio?

What is the probability that a mating of AaBbCC X AABBcc will produce an offspring with a genotype AABbCc?

Suppose that in pitcher plants, yellow seeds (Y) are dominant to green seeds (y), and round seeds (R) are dominant to wrinkled seeds (r). A dihybrid pitcher plant was crossed to plant with green, wrinkled seeds. What is the phenotypic proportion of the progeny expected to have green and wrinkled seeds?

Using the same pitcher plants, suppose a dihybrid pitcher plant was self-crossed to another dihybrid pitcher plant. What is the predicted ratio of all possible phenotypes within the offspring?

Using the same pitcher plant, suppose a dihybrid pitch plant was crossed with a purebred plant with green, wrinkled seeds. What is the predicted ratio of all possible phenotypes within the offspring?

Given the genotypes of two parents, be able to predict the genotypes and phenotypes of the offspring using a Punnett's Square.
How many different types of gametes does each parent produce?
Be able to do this for crosses involving multiple traits (up to 3 traits).