

Mendel and the Gene Idea Chapter 14

1. Explain Mendel's Law of Segregation.
2. Define allele, homozygous, heterozygous, phenotype, and genotype.
3. What is a testcross and how is it useful?
4. Pattypan squash is either white or yellow. In growing the plants, you notice that if you want to get white fruit at least one of the parents must be white. Which color is dominant?
5. Understand how to construct a Punnett square and use it to predict genotypic and phenotypic ratios.
6. Be able to solve simple monohybrid and dihybrid crosses (you can use the Biology 12 practice problems for this).
7. Determine the probability of obtaining the indicated offspring in the following crosses:

Cross	Offspring	Probability
AAbb x AaBb	AAbb	a. $(1/2 \times 1/2 = 1/4)$
AaBB x AaBb	aaBB	b. $(1/4 \times 1/2 = 1/8)$
AABbcc x aabbCC	AaBbCc	c. $(1 \times 1/2 \times 1 = 1/2)$
AaBbCc x AaBbcc	aabbcc	d. $(1/4 \times 1/4 \times 1/2 = 1/32)$

8. Use the rules of probability to determine the expected ratio of offspring showing two recessive traits in the cross: PpYyRr X Ppyyrr.
9. Define complete dominance, incomplete dominance, codominance, multiple alleles, epistasis, and polygenic inheritance.
10. Explain, at the molecular level, how one allele can be dominant over another.
11. Why are most genetic disorders related to enzyme or protein function recessive disorders?
12. How is a pedigree used in genetics?
13. Use examples to help you distinguish between recessively and dominantly inherited disorders.
14. Describe some tools that can be used to identify to carriers of certain alleles.