

**Chapter 6 and 7 Study Guide**

1. State Mendel's principle of dominance.
2. What is probability? How does probability relate to genetics?
3. What is the probability that a couple's first child will be a female?
  - a. What is the probability that the same couple will have three females in a row?
  - b. What is the probability that the same couple forth child will be male?
4. Explain the term segregation as it applies to alleles and the formation of gametes.
5. Define the following terms: homozygous, heterozygous, genotype and phenotype
6. Complete the following cross in a Punnett square: Pp x pp
  - a. What is the genotypic ratio of the F<sub>1</sub> generation?
  - b. If the P allele represents purple flowers and the p allele symbolizes white flowers, what is the phenotypic ratio of the F<sub>1</sub> generation?
7. In pea plants, the allele for yellow seeds is dominant to the allele for green seeds. Predict the genotypic ratio of offspring produced by crossing two parents heterozygous for this trait. Draw a Punnett square to illustrate your prediction.
8. State Mendel's principle of independent assortment.
9. A cross between a white eyed fruit fly and a red eyed fruit fly results in offspring that have pink eyes. What kind of dominance is represented in this cross?
10. A cross between a white haired cow and a red haired bull results in roan, red and white, haired calves. What kind of dominance is represented in this cross?
11. Is it possible for a couple with blood type alleles I<sup>A</sup>i and I<sup>B</sup>i to have offspring with blood type A? Explain your answer.
12. How do multiple alleles and polygenic traits differ?
13. Why can multiple alleles provide many different phenotypes for a trait?
14. How many chromosomes are in a human cell? In a human gamete (sex cell)?
  - a. How many of those chromosomes determine sex? What are they called?
  - b. What are the chromosomes that **do not** determine sex called?
15. Color blindness is a sex-linked disorder. A couple wants to know the chances their unborn daughter will be color blind. The father is color blind and the mother has normal vision. What is daughter's probability of being color blind? Explain your reasoning by using a Punnett square.
16. How do scientists visualize human chromosomes to detect potential genetic disease and disorders?
17. How can a family pedigree be helpful in determining the probability of having a child with a genetic disorder?
18. What is a chromosomal disorder? Name one chromosomal disorder that can result from a nondisjunction.