

Module 09: Inheritance — Study Questions

1. What is the difference between a gene and an allele?
2. Define genotype and phenotype, and give an example of each.
3. What does it mean for an allele to be dominant? Recessive?
4. What is the difference between homozygous and heterozygous?
5. Who was Gregor Mendel, and why is he called the "father of genetics"?
6. What is the law of segregation?
7. In Mendel's experiments, a cross between two purple-flowered plants sometimes produced white-flowered offspring. How is this possible?
8. If you cross two heterozygous tall plants ($Tt \times Tt$), what are the expected genotypic and phenotypic ratios?
9. How do you set up a Punnett square for a monohybrid cross?
10. In a cross between a homozygous dominant (BB) and homozygous recessive (bb) individual, what will be the genotype and phenotype of all offspring?
11. If two heterozygous individuals ($Aa \times Aa$) are crossed, what fraction of offspring would show the recessive phenotype?
12. What is the expected phenotypic ratio of a dihybrid cross between two individuals heterozygous for both traits?
13. What is incomplete dominance? Give an example.
14. How is codominance different from incomplete dominance?
15. Explain the inheritance of ABO blood types and describe what type of inheritance pattern it demonstrates.

16. How is sex determined in humans?
17. What are sex-linked traits, and why are they more common in males?
18. If a carrier woman (X^cX) has children with a man with normal vision (XY), what is the probability their sons will be color blind?
19. What is a pedigree, and how is it used in genetics?
20. How can you tell from a pedigree if a trait is dominant or recessive?