

GENETICS UNIT TEST



Test Contents:

10 Questions (Short Answer)
Critical Thinking Required

Test Your Students Knowledge of:

- Mitosis
- Meiosis
- Pedigree Analysis
- Codominance
- Incomplete Dominance
- Punnett Squares
- Mendel's Laws of Genetics
- Monohybrid Cross
- Dihybrid Cross

3. Crossing over occurs in meiosis I during prophase. Explain the effect crossing over has in terms of genetic variation of chromosome. *Explain the process of crossing over for full points.*

Use the following question for questions 4 and 5 below. Jimmy had blond hair and blue eyes. Jimmy's brother and sister both have brown hair and brown eyes. Jimmy's mother had blond hair and brown eyes and his father has brown hair and blue eyes.

4. What are the phenotypes represented in this family? Use a Punnett square to predict the chances of Jimmy's children having blond hair if he marries a woman with brown hair? *Include percentages for each genotype and phenotype in order to receive full credit.*

Genotypes and Phenotypes: BB (blond hair), bb (brown hair)

5. Refer to question 4. Explain the inheritance of the various phenotypes in Jimmy's family. *Be sure to explain where each of the children obtained certain traits.*

These instructions apply to questions 6 and 7. Examine the pedigree below and determine the type of trait represented. Does the pedigree represent a dominant, recessive or sex-linked trait? Explain your answers to receive full points

6.

7.

8. There are many different types of dominance. Explain the difference between codominance and incomplete dominance. In your explanation, include examples of each type of dominance.

Use the following scenario to answer question 9 and 10. Mendel crossed one plant with yellow seeds and another plant with green seeds (Generation 1) . The result was 100% yellow seeds (Generation 2). When he crosses the yellow seeds, he found that majority of the plants had yellow seeds. However, some plants with green seeds were also produced (Generation 3).

9. According to the explanation above, which traits are the dominant and recessive? Write out the genotypes for each in your responds. Remember sense these are single traits both yellow and green seeds need to be represented by the same letter. *Explain why in order to receive full credit.*

10. Draw a Punnett for each generation and determine the percentages for the phenotype and genotype in each generation. Which generation resembles Mendel's law of segregation?