

Name \_\_\_\_\_  
Number \_\_\_\_\_ Date \_\_\_\_\_

### Chapter 9 Study Guide

1. Who was Gregor Mendel? What did he do?
2. What is a hybrid?
3. Define genes.
4. Define alleles.
5. What is dominance?
6. When a pure bred short plant is crossed with a pure bred tall plant, what do the F<sub>1</sub> plants look like? Why? What allele did the plant inherit from each parent?
7. Draw a punnett square of a cross between a pure bred tall plant and a pure bred short plant. What will the genotypes and phenotypes be of the offspring in the F<sub>1</sub> generation?
8. Draw a punnett square of a cross between two of the F<sub>1</sub> offspring above. What will the genotypes and phenotypes be of the offspring in the F<sub>2</sub> generation?
9. In the above question, what is the probability that a plant in the F<sub>2</sub> generation will be tall? Short?
10. Define homozygous.
11. Define heterozygous.
12. What is the principle of independent assortment?
13. What is the principle of segregation?
14. Explain how the events of meiosis account for the law of segregation and the law of independent assortment.
15. How many different allele combinations would be found in the gametes produced by a pea plant whose genotype was *RrYy*?
16. How many different allele combinations would be found in the gametes produced by a pea plant whose genotype was *RrYy*?
17. Draw the punnett square that shows the following cross. A pea plant that is heterozygous for round, yellow peas (*RrYy*) is crossed with a pea plant that is homozygous for round peas but heterozygous for yellow peas (*RRYy*). How many different phenotypes are their offspring expected to show?
18. Define and give an example of codominance.
19. Define and give an example of incomplete dominance.
20. Define and give an example of polygenic inheritance.
21. What is phenotype?
22. What is genotype?

#### MULTIPLE CHOICE Write the correct letter in the blank.

##### Section 1:

- \_\_\_\_\_ 1. Mendel obtained plants that were true-breeding for particular traits by
- a. growing plants from the seeds of other plants that showed that trait.
  - b. discarding plants that showed others traits.
  - c. allowing plants to self-pollinate for several generations.
  - d. allowing plants to cross-pollinate for one generation.

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- \_\_\_\_\_ 2. When Mendel crossed a strain of tall pea plants with a strain of short pea plants, he observed that all of the plants in the F<sub>1</sub> generation were tall. This suggests that
- a. the tall trait was controlled by a dominant factor.
  - b. the short trait was controlled by a dominant factor.
  - c. both traits were controlled by a recessive factor.
  - d. the strain of short plants was capable of pollinating the strain of tall plants.
- \_\_\_\_\_ 3. A cross between true-breeding green-podded pea plants and true-breeding yellow-podded pea plants produces only green-podded plants. When the F<sub>1</sub> generation is allowed to self-pollinate, the F<sub>2</sub> generation consists of
- a. only green-podded plants.
  - b. only yellow-podded plants.
  - c. about three-quarters yellow-podded plants and one-quarter green-podded plants.
  - d. about three-quarters green-podded plants and one-quarter yellow-podded plants.
- \_\_\_\_\_ 4. When alleles for different characteristics are on separate chromosomes, they are distributed to gametes independently. This observation is summarized by the law of
- a. cross-pollination.
  - b. independent assortment.
  - c. segregation.
  - d. molecular genetics.

##### Section 2

- \_\_\_\_\_ 1. The appearance of an organism is its
- a. genotype.
  - b. phenotype.
  - c. genotypic ratio.
  - d. phenotypic ratio.
- \_\_\_\_\_ 2. A monohybrid cross of two individuals that are heterozygous for a trait exhibiting complete dominance would probably result in a phenotypic ratio of
- a. 4 dominant:0 recessive.
  - b. 1 dominant:3 recessive.
  - c. 3 dominant:1 recessive.
  - d. 1 dominant:1 recessive.
- \_\_\_\_\_ 3. To determine the genotype of an individual that shows the dominant phenotype, you would cross that individual with one that is
- a. heterozygous dominant.
  - b. heterozygous recessive.
  - c. homozygous dominant.
  - d. homozygous recessive.
- \_\_\_\_\_ 4. In a dihybrid cross between an individual with the genotype *RRYY* and an individual with the genotype *rryy*, all of the offspring will have the genotype
- a. *RRYY*.
  - b. *RrYy*.
  - c. *RrYy*.
  - d. *rryy*.
- Be able to perform monohybrid and dihybrid crosses given an example. Give phenotype and genotype ratios as well as the probability of each type of offspring.**