

SECTION 9-1 REVIEW**MENDEL'S LEGACY**

VOCABULARY REVIEW Distinguish between the terms in each of the following pairs of terms.

1. F₁ generation, F₂ generation _____

2. dominant factor, recessive factor _____

3. gene, allele _____

MULTIPLE CHOICE Write the correct letter in the blank.

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

- _____ 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 F₁ 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 not capable of pollinating the strain of tall plants.

- _____ 3. A cross between pure green-podded pea plants and pure yellow-podded pea plants produces only green-podded plants. When the F₁ generation is allowed to self-pollinate, the F₂ 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.

SHORT ANSWER Answer the questions in the space provided.

1. What does the term *strain* mean as it is used in genetic crosses? _____

2. Explain how the events of meiosis account for the law of segregation and the law of independent assortment. _____

3. If orange flower color in a plant is controlled by an allele *F* and red flower color is controlled by an allele *f*, which flower color is dominant? _____

If pure orange-flowered plants are crossed with pure red-flowered plants, what will be the flower color(s) of the F_1 plants? _____

4. **Critical Thinking** How would Mendel's observations and conclusions have been different if many of the characteristics he studied, such as seed color and seed texture, had been controlled by genes located close together on the same chromosome? _____

STRUCTURES AND FUNCTIONS In the spaces inside each gamete, indicate the four possible combinations of alleles the gametes could receive.

The diagram below shows the assortment of two pairs of homologous chromosomes during meiosis. One pair has a gene for flower color (*R* allele = red, *r* allele = white). The other pair has a gene for seed color (*B* allele = brown, *b* allele = gray).

