

Codominance

For all of the traits that Mendel studied, one allele was dominant while the other was recessive. This is not always the case. For some alleles, an inheritance pattern called **codominance** exists. In **codominance**, the alleles are neither dominant nor recessive. As a result, both alleles are expressed in the offspring.

Look at Figure 10. Mendel's principle of dominant and recessive alleles does not explain why the heterozygous chickens have both black and white feathers. The alleles for feather color are codominant—neither dominant nor recessive. As you can see, neither allele is masked in the heterozygous chickens. Notice also that the codominant alleles are written as capital letters with superscripts— F^B for black feathers and F^W for white feathers. As the Punnett square shows, heterozygous chickens have the $F^B F^W$ allele combination.



How are the symbols for codominant alleles written?

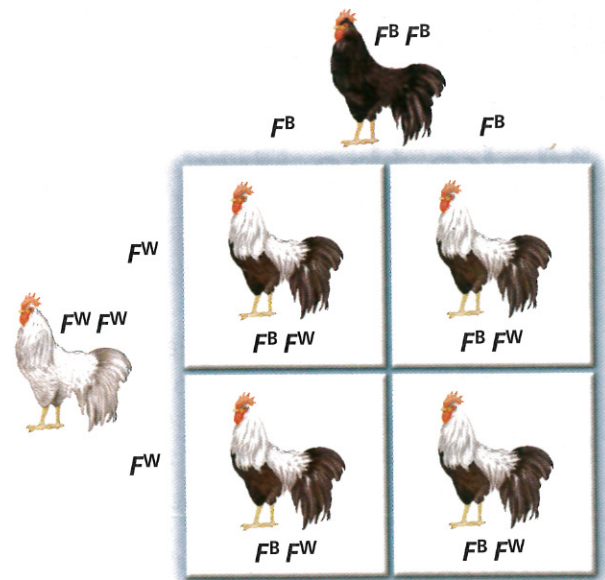


FIGURE 10

Codominance

The offspring of the cross in this Punnett square will have both black and white feathers.

Classifying Will the offspring be heterozygous or homozygous? Explain your answer.

Section 2 Assessment

Target Reading Skill Building Vocabulary Use your definitions to help you answer the questions.

Reviewing Key Concepts

1. a. **Reviewing** What is probability?
b. **Explaining** If you know the parents' alleles for a trait, how can you use a Punnett square to predict the probable genotypes of the offspring?
c. **Predicting** A pea plant with round seeds has the genotype Rr . You cross this plant with a wrinkled-seed plant, genotype rr . What is the probability that the offspring will have wrinkled seeds? (Use a Punnett square to help with the prediction.)
2. a. **Defining** Define *genotype* and *phenotype*.
b. **Relating Cause and Effect** Explain how two organisms can have the same phenotype but different genotypes. Give an example.
c. **Applying Concepts** A pea plant has a tall stem. What are its possible genotypes?
3. a. **Explaining** What is codominance? Give an example of codominant alleles and explain why they are codominant.
b. **Applying Concepts** What is the phenotype of a chicken with the genotype $F^B F^W$?

Math Practice

4. **Ratios** A scientist crossed a tall pea plant with a short pea plant. Of the offspring, 13 were tall and 12 were short. Write the ratio of each phenotype to the total number of offspring. Express the ratios as fractions.
5. **Percentage** Use the fractions to calculate the percentage of the offspring that were tall and the percentage that were short.