

## Section: Studying Heredity

Read the passage below. Then answer the questions that follow.

A **Punnett square** is a diagram that predicts the expected outcome of a genetic cross by considering all possible combinations of gametes in the cross. Named for its inventor, Reginald Punnett, the Punnett square in its simplest form consists of four boxes inside a square. The possible gametes that one parent can produce are written along the top of the square. The possible gametes that the other parent can produce are written along the left side of the square. Each box inside the square is filled with two letters obtained by combining the allele along the top of the box with the allele along the side of the box. The letters in the boxes indicate the possible genotypes of the offspring.

### SKILL: READING EFFECTIVELY

Read each question, and write your answer in the space provided.

1. What information does the first sentence tell the reader?

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2. What do letters written along the top and left side of a Punnett square represent?

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3. How is the combination of letters inside each square determined?

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4. What do the letters in the boxes indicate?

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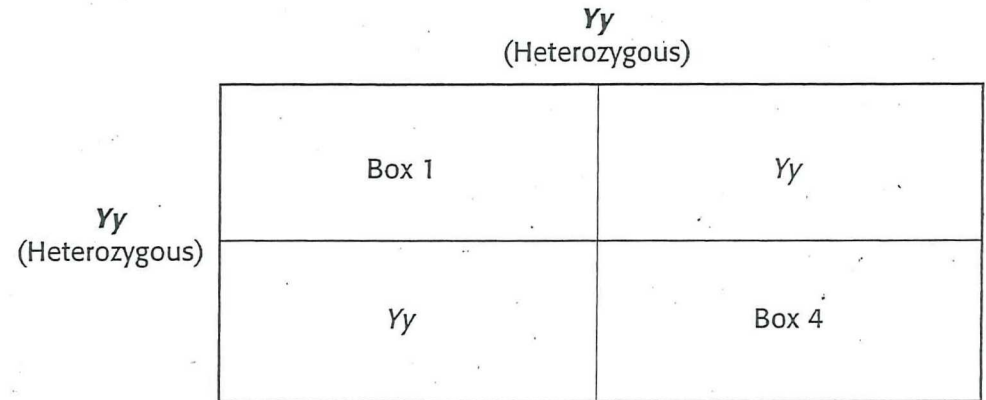
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5. What data did Mendel obtain when he examined each  $F_1$  plant?

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### SKILL: ORGANIZING INFORMATION

The figure below shows a Punnett square. It shows a cross between two pea plants that are heterozygous for seed color. Use the Punnett square to answer the questions that follow. Write your answers in the spaces provided.



6. What pair of letters should appear in Box 1?

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7. What pair of letters should appear in Box 4?

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8. How many homozygous dominant offspring would be produced?

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9. How many homozygous recessive offspring would be produced?

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10. How many heterozygous offspring would be produced?

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11. How many of the offspring would have green seeds?

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12. How many of the offspring would have yellow seeds?

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# Directed Reading

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Complete each statement by writing the correct term or phrase in the space provided.

1. In a test cross to determine if an individual with a dominant phenotype is heterozygous or homozygous for the trait, you always cross the individual with a homozygous \_\_\_\_\_ individual.
2. If the offspring of a test cross all have the dominant trait, then the genotype of the individual being tested is \_\_\_\_\_.
3. If some of the offspring of a test cross have the recessive trait, then the genotype of the individual being tested is \_\_\_\_\_.
4. The probability that a gamete from a plant with a  $Tt$  genotype will carry a  $t$  allele is \_\_\_\_\_.
5. The probability of homozygous recessive offspring resulting from a cross between two homozygous dominant individuals is \_\_\_\_\_.
6. The probability of heterozygous offspring resulting from a cross between two heterozygous individuals is \_\_\_\_\_.

Read each question, and write your answer in the space provided.

7. When studying a pedigree, how do scientists determine if a trait is sex-linked or autosomal?

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8. When studying a pedigree, how do scientists determine if a trait is dominant or recessive?

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