10 Sexual Reproduction and Genetics

2 Mendelian Genetics

TEKS 2(B), 3(F), 6(A), 6(F)

MAIN IDEA

Write the Main Idea for this lesson.

REVIEW VOCABULARY

segregation

Recall the definition of the Review Vocabulary term.

segregation

NEW VOCABULARY

allele

genetics

hybrid

law of independent assortment

law of segregation

dominant

genotype

heterozygous

homozygous

phenotype

recessive

Use terms in the left margin to complete the paragraph below.

_____ is the branch of biology that studies how traits are inherited. _____ offspring result from parents that have different forms of _____ for certain traits. Mendel's _____ states that every individual has two alleles of each gene and when gametes are produced, each gamete receives one of these alleles. Mendel's _____ states that genes for different traits are inherited independently of each other.

Compare and contrast each pair of terms by defining them and/or noting their differences.

dominant trait	**recessive trait**
genotype	**phenotype**
homozygous	**heterozygous**

2 Mendelian Genetics (continued)

Student Edition, pp. 277-282

Reading Essentials, pp. 109-112

Describe how a plant self-pollinates.

GET IT? **Infer** why it is important that Mendel's experiments used a true-breeding plant.

Analyze Mendel's experiment with green-seed and yellow-seed pea plants by completing this summary paragraph.

Mendel used only _____ lines, which consistently produced the same trait in the offspring. To see how these traits are inherited, Mendel _____ When he crossed a green-seed plant with a yellow-seed plant, the F_1 offspring were _____ percent yellow and _____ percent green. He allowed the F_1 plants to _____ to produce _____ plants. The F_2 plants were _____ percent yellow and _____ percent green. Mendel concluded that each trait has two forms, called _____ Mendel called yellow seed color the _____ form and green seed color the _____ form of the trait.

Compare genotypes and phenotypes for pea plants.

Genotype	Homozygous or Heterozygous	Phenotype
	homozygous	
	heterozygous	
yy		

2 Mendelian Genetics (continued)

Demonstrate the law of independent assortment by listing the 4 alleles that are produced when a pea plant with the genotype YyRr produces gametes.

1. _____ **2.** _____ **3.** _____ **4.** _____

GET IT? **Evaluate** How can the random distribution of alleles result in a predictable ratio?

Complete the Punnett squares for seed texture in the F_1 and F_2 generations. Round seeds (R) are dominant over wrinkled seeds (r). Write the expected genotypes and the probability for each.

F_1

	R	R
r		
r		

_____

F_2

	R	r
R		
r		

_____
_____
_____

Identify the genotypes within the Punnett square showing the dihybrid cross of seed color and seed texture. The first row has been done for you. Write the expected phenotypic ratio.

	YR	yR	Yr	yr
YR	YYRR	YyRR	YYRr	YyRr
yR				
Yr				
yr				

Phenotypic ratio: _____

2 Mendelian Genetics (continued)

REVIEW IT!

1. **MAIN**IDEA **Diagram** Use a Punnett square to explain how a dominant allele masks the presence of a recessive allele.

2. **Apply** the law of segregation and the law of independent assortment by giving an example of each.

3. **Use a Punnett square** In fruit flies, red eyes *(R)* are dominant to pink eyes *(r)*. What is the phenotypic ratio of a cross between a heterozygous male and a pink-eyed female?

4. **Evaluate** the significance of Mendel's work to the field of genetics.

5. What is the probability of rolling a 2 on a six-sided die? What is the probability of rolling two 2s on two six-sided die? How is probability used in the study of genetics?