Chapter 10

Mendel and Meiosis

Reinforcement and Study Guide

Section 10.1 Mendel's Laws of Heredity

In your textbook, read why Mendel succeeded.

Complete each statement.

1. Mendel was the first person to succeed in predicting how traits are _____ from generation to generation.
2. Mendel used _____ plants in his experiments.
3. In peas, both male and female sex cells—_____—are in the same flower.
4. _____ occurs when the male gamete fuses with the female gamete.
5. Mendel used the process called _____ when he wanted to breed one plant with another.
6. Mendel carefully _____ his experiments and the peas he used.
7. Mendel studied only one _____ at a time and analyzed his data mathematically.

In your textbook, read about Mendel's monohybrid crosses.

Refer to the table of pea-plant traits on the right. Then complete the table on the left by filling in the missing information for each cross. The first one is done for you.

Parent Plants	F_1 generation	
	Offspring	Appearance
8. round × wrinkled *RR* × *rr*	*Rr*	round
9. yellow × green *YY* × *yy*		
10. axial × terminal *AA* × _____	*Aa*	
11. tall × short _____ × _____	*Tt*	
12. inflated × constricted _____ × *ii*		

Pea-Plant Traits		
Trait	Dominant	Recessive
seed shape	round (*R*)	wrinkled (*r*)
seed color	yellow (*Y*)	green (*y*)
flower position	axial (*A*)	terminal (*a*)
plant height	tall (*T*)	short (*t*)
pod shape	inflated (*I*)	constricted (*i*)

In your textbook, read about phenotypes and genotypes and Mendel's dihybrid crosses.

Determine if the statement is true. If it is not, rewrite the underlined part to make it true.

13. A pea plant with the genotype *TT* has the same phenotype as a pea plant with genotype *tt*. _____

14. When Mendel crossed true-breeding pea plants that had round yellow seeds with true-breeding pea plants that had wrinkled green seeds, some of the offspring had round yellow seeds because round and yellow were the dominant forms of the traits. _____

15. When Mendel allowed heterozygous F_1 plants that had round yellow seed to self-pollinate, he found that some of the F_2 plants had wrinkled green seeds. _____

16. The law of independent assortment states that genes for different traits are inherited independently of each other. _____

In your textbook, read about Punnett squares and probability.

The Punnett square below is for a dihybrid cross between pea plants that are heterozygous for seed shape (*Rr*) and seed color (*Yy*). Complete the Punnett square by recording the expected genotypes of the offspring. Then answer the questions.

	RY	***Ry***	***rY***	***ry***
RY				
Ry				
rY				
ry				

17. Use the chart on the previous page to determine the phenotypes of the offspring. Record the phenotypes below the genotypes in the Punnett square. Is an offspring produced by the cross more likely to have wrinkled seeds or round seeds? _____

18. What is the probability that an offspring will have wrinkled yellow seeds? _____