

Skills Worksheet

# Chapter Review

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## USING KEY TERMS

Complete each of the following sentences by choosing the correct term from the word bank.

sex cells

genotype

sex chromosomes

alleles

phenotype

meiosis

1. Sperm and eggs are known as **sex cells**.
2. The **phenotype** is the expression of a trait and is determined by the combination of alleles called the **genotype**.
3. **Meiosis** produces cells with half the normal number of chromosomes.
4. Different versions of the same genes are called **alleles**.

## UNDERSTANDING KEY IDEAS

### Multiple Choice

- d** \_ 5. Genes carry information that determines
- a. alleles.
  - b. ribosomes.
  - c. chromosomes.
  - d. traits.
- c** \_\_\_ 6. The process that produces sex cells is
- a. mitosis.
  - b. photosynthesis.
  - c. meiosis.
  - d. probability.

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**b** \_ 7. The passing of traits from parents to offspring is called

- a. probability.
- b. heredity.
- c. recessive.
- d. meiosis.

**b** \_\_\_ 8. If you cross a white flower with the genotype  $pp$  with a purple flower with the genotype  $PP$ , the possible genotypes in the offspring are

- a.  $PP$  and  $pp$ .
- b. all  $Pp$ .
- c. all  $PP$ .
- d. all  $pp$ .

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c \_\_\_ 9. For the cross in item 8, what would the phenotypes be?

- a. all white
- b. 3 purple and 1 white
- c. all purple
- d. half white, half purple

c \_ 10. In meiosis,

- a. chromosomes are copied twice.
- b. the nucleus divides once.
- c. four cells are produced from a single cell.
- d. two cells are produced from a single cell.

b \_\_\_ 11. When one trait is not completely dominant over another, it is called

- a. recessive.
- b. incomplete dominance.
- c. environmental factors.
- d. uncertain dominance.

### Short Answer

12. Which sex chromosomes do females have? Which do males have?

Females have two X chromosomes, and males have one X and one Y chromosome.

13. In one or two sentences, define the term *recessive trait* in your own words.

A recessive trait is a genetic trait that is expressed only if there is not a dominant allele present.

14. How are sex cells different from other body cells?

Sex cells have half the number of chromosomes as other body cells.

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15. What is a sex-linked disorder? Give one example of a sex-linked disorder that is found in humans.

A sex-linked disorder is a disorder that is caused by a gene on one of the sex chromosomes and so is expressed in one sex more than the other. Color blindness is a sex-linked disorder found in humans.

### CRITICAL THINKING

16. **Concept Mapping** Use the following terms to create a concept map: *meiosis*, *eggs*, *cell division*, *X chromosome*, *mitosis*, *Y chromosome*, *sperm*, and *sex cells*.

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17. **Identifying Relationships** If you were a carrier of one allele for a certain recessive disorder, how could genetic counseling help you prepare for the future?

A genetic counselor could test my spouse to see if my spouse is also a carrier of the recessive allele. The counselor could then predict what the chances are that we could have a child with the recessive disorder.

18. **Applying Concepts** If a child has blond hair and both of her parents have brown hair, what does that tell you about the allele for blond hair? Explain.

The allele for blond hair is recessive.

19. **Applying Concepts** What is the genotype of a pea plant that is true-breeding for purple flowers?

PP

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**INTERPRETING GRAPHICS**

Use the Punnett square below to answer the questions that follow.

		?	?
<i>T</i>	<i>TT</i>	<i>TT</i>	
<i>t</i>	<i>Tt</i>	<i>Tt</i>	

20. What is the unknown genotype?

*TT*

21. If *T* represents the allele for tall pea plants and *t* represents the allele for short pea plants, what is the phenotype of each parent and of the offspring?

All the parents and offspring are tall pea plants.

22. If each of the offspring were allowed to self-fertilize, what are the possible genotypes in the next generation?

	<i>T</i>	<i>T</i>		<i>T</i>	<i>t</i>
<i>T</i>	<i>TT</i>	<i>TT</i>		<i>TT</i>	<i>Tt</i>
<i>T</i>	<i>TT</i>	<i>TT</i>		<i>Tt</i>	<i>tt</i>

Self-fertilization of *TT* (*TT* × *TT*) will yield offspring that are all *TT*. Self-fertilization of *Tt* (*Tt* × *Tt*) will yield offspring that are *TT*, *Tt*, and *tt*.

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23. What is the probability of each genotype in item 22?

*TT* has a 100% probability with a *TT* parent and a 25% probability with a *Tt* parent. *Tt* has a 50% probability with a *Tt* parent, and a 0% probability with a *TT* parent. The genotype *tt* has a 25% probability with a *Tt* parent, and a 0% probability with a *TT* parent.