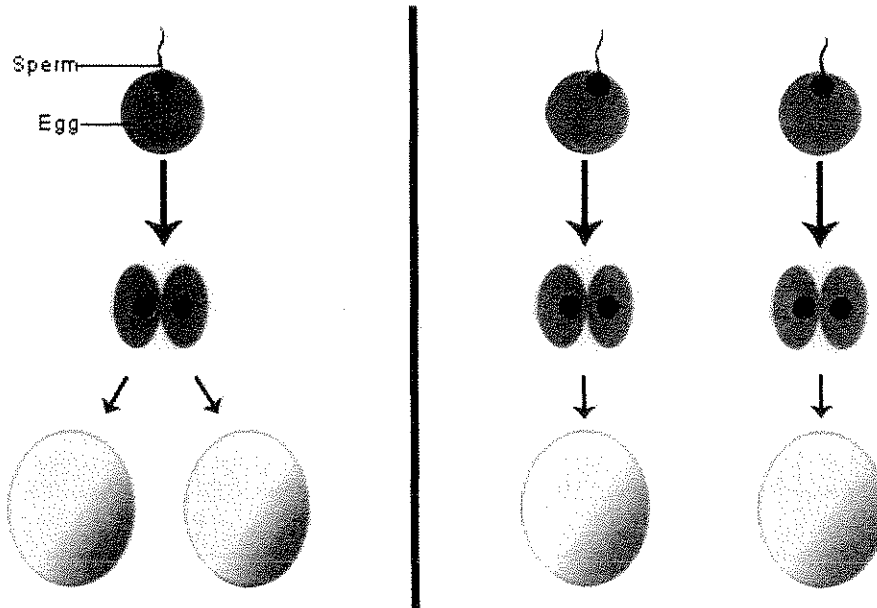


Across

- 8. chromosomes with the same sequence of genes
- 11. one set of instructions or code for an inherited trait
- 12. a family tree that shows a genetic trait being passed on

Down

- 1. an organism's appearance or some physical characteristic
- 2. the trait that can only appear if there are two alleles for it
- 3. the genetic make up of an organism: contains two alleles
- 4. cell division that results in four cells with half the number of original chromosomes
- 5. a form of a gene: half of a genotype
- 6. the chance or likelihood that something will happen
- 7. the trait that always appears if there is at least one allele for it
- 9. chromosome one of the pair of chromosomes that determines the sex of an individual
- 10. the passing of genetic traits from parent to offspring



Which diagram would result in fraternal twins?

The diagram on the right represents fraternal twins. Two eggs with different DNA were fertilized by two sperms with different DNA. The two resulting offspring will have different DNA, but be born at the same time.

Which diagram would result in identical twins?

The diagram on the left would represent identical twins. One egg and one sperm created one zygote. The zygote then split into two different offspring that both had the same DNA.

What is the difference between fraternal and identical twins?

Identical twins have the same DNA produced from the same sperm and egg, while fraternal twins are produced by two different sperms fertilizing two different eggs.

Which twins can be the opposite sex? Why?

Only fraternal twins can be the opposite sex. A sperm carries only one sex chromosome (X or Y). If the sperm has an X sex chromosome then the offspring will be female, if it has a Y sex chromosome then the offspring will be male. If twins are identical, they must have the same DNA and therefore would have the same sex chromosomes.

Can conjoined twins be fraternal twins? Why?

Conjoined twins develop from one zygote. As the zygote goes through mitosis to produce more and more cells it starts to separate. However, it does not fully separate and stays attached. Depending on where the twins are connected and what, if any, organs they share, they can be surgically separated after birth. Conjoined twins that are still connected can still live normal lives

Why are they called fraternal twins?

Fraternal means brother, indicating the twins are still siblings, but do not have the same DNA. They are no more genetically similar than your siblings (unless you are an identical twin). If non-identical twins are sisters, the correct term is sororal twins. Sororal means sister.



Standardized Test Preparation *continued*

Passage 2 Sickle cell anemia is a recessive genetic disorder. # 1

People inherit this disorder only when they inherit the disease-causing recessive allele from both parents. The disease causes the body to make red blood cells that bend into a sickle (or crescent moon) shape. The sickle-shaped red blood cells break apart easily. Therefore, the blood of a person with sickle cell anemia carries less oxygen. Sickle-shaped blood cells also tend to get stuck in blood vessels. When a blood vessel is blocked, the blood supply to organs can be cut off. # 3 But the sickle-shaped blood cells can also protect a person from malaria. # 2 Malaria is a disease caused by an organism that invades red blood cells.

A

1. According to the passage, sickle cell anemia is a
 - A recessive genetic disorder.
 - B dominant genetic disorder.
 - C disease caused by an organism that invades red blood cells.
 - D disease also called *malaria*.

H

2. According to the passage, sickle cell anemia can help protect a person from
 - F blocked blood vessels.
 - G genetic disorders.
 - H malaria.
 - I low oxygen levels.

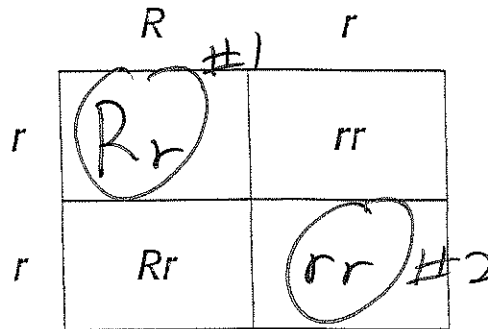
A

3. Which of the following is a fact in the passage?
 - A When blood vessels are blocked, vital organs lose their blood supply.
 - B When blood vessels are blocked, it causes the red blood cells to bend into sickle shapes.
 - C The blood of a person with sickle cell anemia carries more oxygen.
 - D Healthy red blood cells never get stuck in blood vessels.

Standardized Test Preparation *continued*

INTERPRETING GRAPHICS

The Punnett square below shows a cross between two flowering plants. Use this Punnett square to answer the questions that follow.



- B 1. What is the genotype of the offspring represented in the upper left-hand box of the Punnett square?
- A RR
 - B Rr
 - C rr
 - D rrr
- H 2. What is the genotype of the offspring represented in the lower right-hand box of the Punnett square?
- F RR
 - G Rr
 - H rr
 - I rrr
- B 3. What is the ratio of Rr (purple-flowered plants) to rr (white-flowered plants) in the offspring?
- A 1:3
 - B 2:2
 - C 3:1
 - D 4:0

Skills Worksheet

Chapter Review

USING KEY TERMS

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

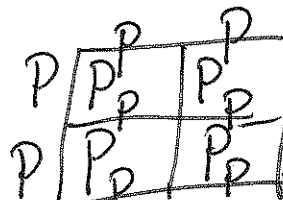
sex cells genotype sex chromosomes
 alleles phenotype meiosis

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.
- 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 .



Chapter Review *continued*

C 9. For the cross in item 8, what would the phenotypes be?

- a. all white
- b. purple and 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: XX

males: XY

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

Recessive traits are not as common as dominant traits. For the recessive trait to show, the organism needs to have two alleles for it.

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

Sex cells are produced by meiosis and have half the number of chromosomes that body cells have. Body cells, also known as germ or gametes, are produced by mitosis.

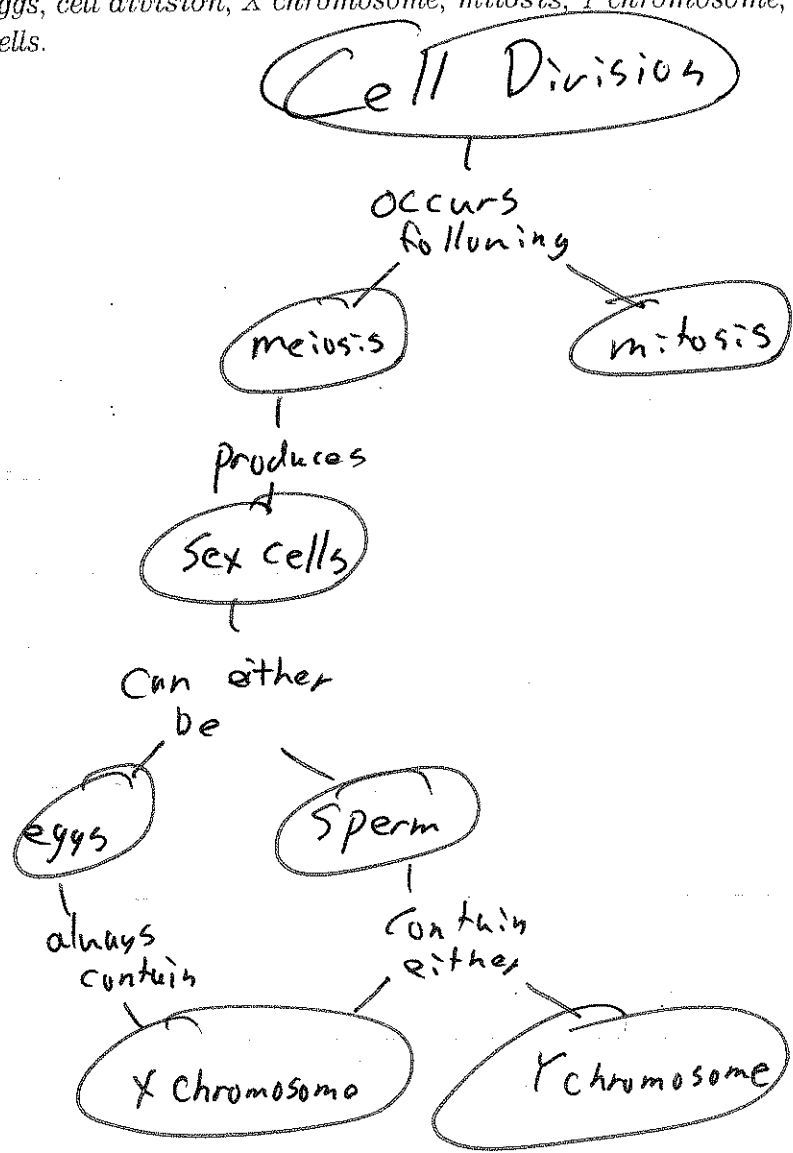
Chapter Review continued

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

A sex-linked disorder is from a gene that is only on the X chromosome. Color-blindness is an example of a sex-linked disorder.

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*.



Chapter Review continued

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?

You would want to know how serious the disorder is and if your partner also had the allele for it. If it was a serious disorder you might want to think about how it could affect your children, or how you would prepare for children.

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.

Brown hair can't be determined by a single recessive gene. If it was the child could only inherit alleles for brown hair and would also have brown hair like their parents.

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

PP

Chapter Review *continued*

INTERPRETING GRAPHICS

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

		?T	?T
T		TT	TT
t		Tt	Tt

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?

parents both tall
 offspring all tall

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

TT, Tt or tt

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

TT → 100% TT
 Tt → 25% TT 50% Tt 25% tt
