

Modern Genetics ▪ *Reading/Notetaking Guide*

Human Inheritance (pp. 192–198)

This section explains some patterns of inheritance in humans. It also describes the functions of the sex chromosomes and the relationship between genes and the environment.

Use Target Reading Skills

As you read, write the main idea—the biggest or most important idea—in the graphic organizer below. Then write three supporting details that further explain the main idea.

Main Idea		
Human traits are controlled by single genes with two alleles, single genes with . . .		
Detail	Detail	Detail
a.	b.	c.

Patterns of Human Inheritance (pp. 193–194)

1. The probability that two heterozygous parents for widow's peak will have a child with a straight hairline is _____ percent.
2. In what three ways are human traits controlled?

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3. A gene with _____ has three or more alleles for a single trait.
4. Is the following sentence true or false? Even though a gene has multiple alleles, a person can carry only two of those alleles. _____
5. Complete the table by writing all possible combinations of alleles for each blood type.

Blood Types	
Blood Type	Combination of Alleles
A	
B	
AB	
O	

6. Why do some human traits, such as height and hair color, show a large number of phenotypes?

7. Is the following sentence true or false? Skin color is controlled by more than one gene. _____

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Human Inheritance *(continued)*

The Sex Chromosomes (pp. 195–197)

8. Is the following sentence true or false? Genes on the sex chromosomes determine whether a baby is a boy or a girl. _____
9. Females have two _____ chromosomes. Males have one _____ chromosome and one _____ chromosome.
10. Circle the letter of each sentence that is true about human sex chromosomes.
 - a. All eggs carry one X chromosome.
 - b. Half of a male's sperm cells have an X chromosome.
 - c. None of a male's sperm cells have a Y chromosome.
 - d. The egg determines the sex of the child.
11. Genes on the X and Y chromosomes are called _____.
12. Why are males more likely than females to have a sex-linked trait that is controlled by a recessive allele?

13. Is the following question true or false? A carrier for colorblindness is colorblind. _____
14. Why is a son who receives the allele for colorblindness from his mother always colorblind?

The Effect of Environment (p. 198)

15. The effects of genes are often altered by the _____.
16. List one environmental factor that can affect a person's height.

Modern Genetics ▪ *Reading/Notetaking Guide***Human Genetic Disorders** (pp. 199–203)

This section describes how changes in the DNA of some genes have affected certain traits in humans.

Use Target Reading Skills

As you read, compare and contrast the types of genetic disorders by completing the table below.

Disorder	Description	Cause
Cystic fibrosis	Abnormally thick mucus	Loss of three DNA bases
Sickle-cell disease		
Hemophilia		
Down syndrome		

Introduction (p. 199)

1. An abnormal condition that a person inherits through genes or chromosomes is called a(n) _____.

Causes of Genetic Disorders (p. 200)

2. What causes genetic disorders?

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3. What is cystic fibrosis?

4. Is the following sentence true or false? Cystic fibrosis is caused by a mutation that is the dominant allele of a gene. _____

5. Circle the letter of the protein that is not normal in people with sickle-cell disease.

- | | |
|--------------------|---------------------|
| a. mucus | b. hemoglobin |
| c. red blood cells | d. clotting protein |

6. The allele for the sickle-cell trait is _____ with the normal allele.

7. Is the following sentence true or false? Hemophilia is caused by a dominant allele on the X chromosome. _____

8. Hemophilia occurs more often in _____.

9. Circle the letter of the cause of Down syndrome.

- a. recessive allele
- b. dominant allele
- c. too many chromosomes
- d. too few chromosomes

10. Down syndrome most often occurs when _____ fail to separate properly during meiosis.

Pedigrees (p. 201)

11. A chart or "family tree" that tracks which members of a family have a certain trait is called a(n) _____.

12. Is the following sentence true or false? On a pedigree, a circle represents a male. _____

Managing Genetic Disorders (pp. 202–203)

13. How can people be helped when they have a genetic disorder?

14. A _____ is a picture of all the chromosomes in a cell.

15. What is a karyotype used for? What can it reveal?

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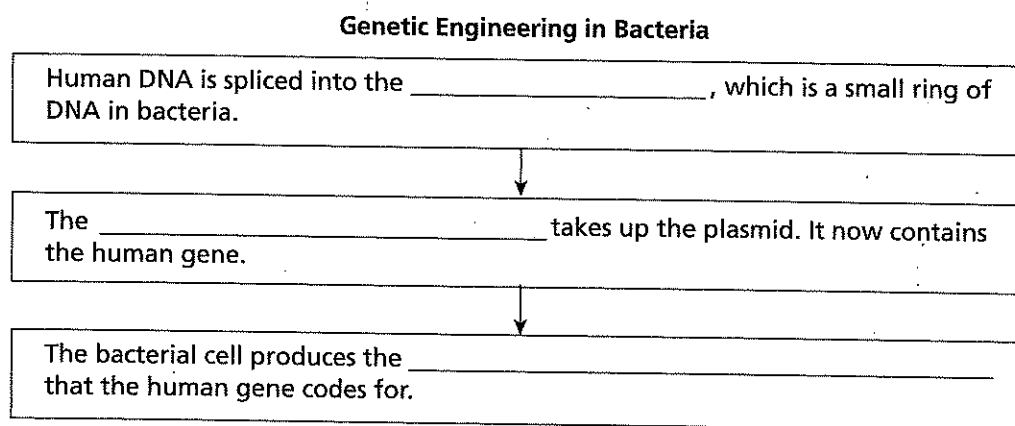
Advances in Genetics (continued)

Cloning (p. 207)

5. Circle the letter of each sentence that is true about cloning.
 - a. A clone has exactly the same genes as the organism from which it was produced.
 - b. A cutting is one way to make a clone of an animal.
 - c. It's easier to clone an animal than it is to clone a plant.
6. Is the following sentence true or false? Cloning can be done only in animals. _____

Genetic Engineering (pp. 208–209)

7. In genetic engineering, genes from one organism are transferred into the _____ of another organism.
8. Complete this flowchart about genetic engineering in bacteria.



9. What is gene therapy?

Learning About Human Genetics (p. 210)

10. All the DNA in one cell of an organism is a(n) _____.
11. What has been the goal of the Human Genome Project?

12. How is a DNA fingerprint produced?
