



## Chapter Review

# Heredity

### Part A. Vocabulary Review

**Directions:** Complete the following sentences using the terms listed below.

<b>alleles</b>	<b>dominant</b>	<b>genetic engineering</b>	<b>recombinant DNA</b>
<b>genotype</b>	<b>heredity</b>	<b>heterozygous</b>	<b>homozygous</b>
<b>incomplete dominance</b>	<b>multiple alleles</b>	<b>pedigree</b>	<b>phenotype</b>
<b>polygenic inheritance</b>	<b>gene therapy</b>	<b>recessive</b>	<b>sex-linked gene</b>

- The allele for hemophilia is on the X chromosome and is a \_\_\_\_\_.
- \_\_\_\_\_ is the passing of traits from one generation to another.
- The different forms a gene may have for a trait are called \_\_\_\_\_.
- In \_\_\_\_\_ both alleles are expressed in offspring.
- \_\_\_\_\_ is made by inserting a useful segment of DNA from one organism into a bacterium.
- A \_\_\_\_\_ trait covers up other traits.
- In a Punnett square, a small letter (t) stands for a \_\_\_\_\_ allele.
- In \_\_\_\_\_, a normal allele is placed into a virus.
- The genetic makeup of an organism is called its \_\_\_\_\_.
- \_\_\_\_\_ is the way an organism looks and behaves a result of its gene type.
- In \_\_\_\_\_ there are more than two alleles possible for a trait.
- A \_\_\_\_\_ show patterns of genetic inheritance in a family.
- Through \_\_\_\_\_ scientists are experimenting to change the arrangement of DNA in a gene.
- An organism with two alleles that are exactly the same is \_\_\_\_\_.
- \_\_\_\_\_ occurs when a group of gene pairs acts together to produce a single trait.
- An organism that has two different alleles for a trait is \_\_\_\_\_.

## Chapter Review (continued)

**Directions:** Study the meanings of the prefixes listed below. Then write a word that contains a prefix from the list next to its definition.

**hetero—different**

**homo—same**

**poly—many**

17. \_\_\_\_\_ an organism whose two genotype alleles are exactly the same
18. \_\_\_\_\_ an organism with two different alleles for a trait
19. \_\_\_\_\_ a type of inheritance where more than one set of genes controls a trait

### Part B. Concept Review

**Directions:** Answer the following questions using complete sentences.

In questions 1, 2, and 3 below, state the three main points of how traits are inherited.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

4. Give an example of multiple alleles. \_\_\_\_\_

5. Give an example of polygenic inheritance. \_\_\_\_\_

6. Describe a genetic disorder.

\_\_\_\_\_

\_\_\_\_\_

7. Describe genetic engineering and give one example of it.

\_\_\_\_\_

\_\_\_\_\_

8. a. How could two parents with blood types A and B have a child with blood type O?

\_\_\_\_\_

b. What would be used to represent the genotypes of these parents?

\_\_\_\_\_

**Directions:** Complete the Punnett square by writing the parental genotypes in the correct places and determining the possible genotypes of the offspring.

Dominant gene: curly hair (H)

Recessive gene: straight hair (h)

Parents: Hh × hh


9. What are the phenotypes of the offspring? \_\_\_\_\_



## Chapter Test

# Heredity

## I. Testing Concepts

**Directions:** Match the description in the first column with the term in the second column by writing the correct letter in the space provided. Some items in the second column may not be used.

- |                                                           |                          |
|-----------------------------------------------------------|--------------------------|
| _____ 1. passing of traits from one generation to another | a. recombinant DNA       |
| _____ 2. inserting DNA into bacteria                      | b. dominant              |
| _____ 3. study of inheritance                             | c. genetics              |
| _____ 4. an allele inherited on a sex chromosome          | d. genotype              |
| _____ 5. a trait that is hidden                           | e. heredity              |
| _____ 6. the chance that an event will take place         | f. heterozygous          |
| _____ 7. genetic makeup of an organism                    | g. gene therapy          |
| _____ 8. a normal allele is placed into a virus           | h. incomplete dominance  |
| _____ 9. physical appearance resulting from genotype      | i. pedigree              |
| _____ 10. both alleles are expressed in offspring         | j. phenotype             |
| _____ 11. more than one set of genes controls a trait     | k. polygenic inheritance |
|                                                           | l. probability           |
|                                                           | m. recessive             |
|                                                           | n. sex-linked gene       |

**Directions:** For each of the following, write the letter of the term or phrase that best completes each sentence.

- \_\_\_\_\_ 12. In a Punnett square, a capital letter (T) stands for a \_\_\_\_\_ allele.  
 a. dominant      b. heterozygous      c. recessive      d. sex-linked
- \_\_\_\_\_ 13. The combination Tt represents a \_\_\_\_\_ genotype.  
 a. heterozygous      b. homozygous      c. purebred      d. sex-linked
- \_\_\_\_\_ 14. Experiments with four o'clock flowers produced examples of \_\_\_\_\_ dominance.  
 a. heterozygous      b. homozygous      c. incomplete      d. recessive
- \_\_\_\_\_ 15. Blood type is an example of \_\_\_\_\_.  
 a. multiple alleles      c. polygenic inheritance  
 b. a pair of genes      d. sex-linked genes
- \_\_\_\_\_ 16. Color blindness is an example of \_\_\_\_\_.  
 a. a sex-linked disorder      c. a genetic disorder  
 b. incomplete dominance      d. polygenic inheritance
- \_\_\_\_\_ 17. Genetic engineering has already helped people by \_\_\_\_\_.  
 a. altering pedigrees      c. eliminating infant deaths  
 b. curing Down Syndrome      d. producing medicine
- \_\_\_\_\_ 18. Through recombinant DNA, scientists have been able to \_\_\_\_\_.  
 a. cure color blindness      c. alter viruses  
 b. manufacture insulin      d. improve tomatoes

**Chapter Test (continued)****II. Understanding Concepts**

**Directions:** Use the information given to answer the following questions.

**Skill: Observing and Inferring**

Fur length is an inherited trait in guinea pigs. Short fur is dominant (F) and long fur is recessive (f).

1. From your study of Mendel's experiments, infer how two parents with short fur could have offspring with long fur.

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2. What letters would be used to represent the genotype of these parents?

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3. Describe the phenotype of these parents.

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**Directions:** Complete the statements by filling in the blanks.

4. Gregor Mendel's work can be summed up in three main ideas:

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_

**Skill: Comparing and Contrasting**

5. Compare and contrast phenotypes and genotypes.

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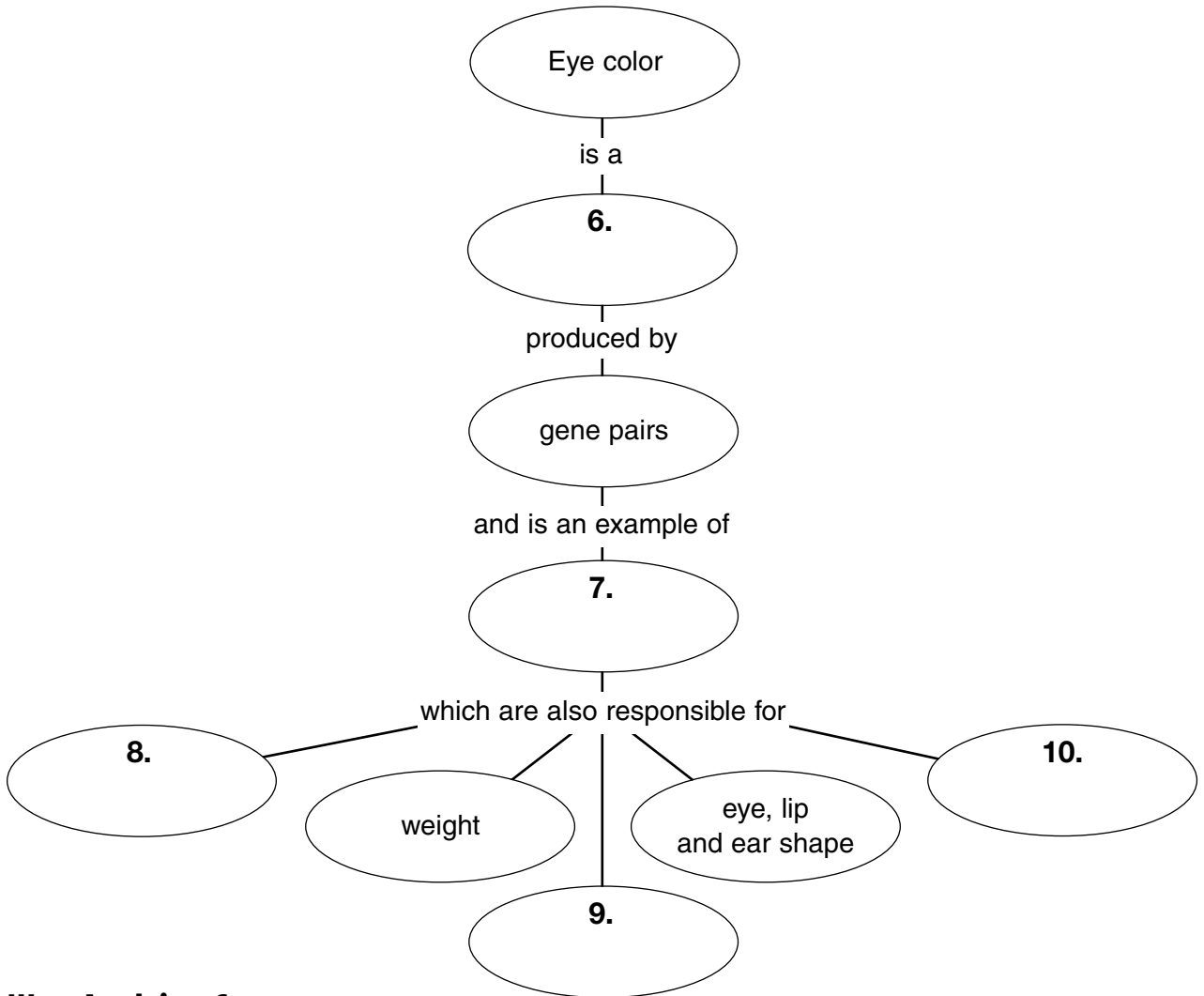
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## Chapter Test (continued)

### Skill: Concept Mapping

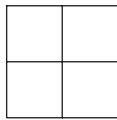
**Directions:** Complete the following concept map.



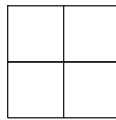
### III. Applying Concepts

**Directions:** Study the genetics problems below. Complete the Punnett squares by writing the parent genotypes in the correct place and determining the offspring genotypes. Then, describe each phenotype.

1. Dominant: chin cleft (C)  
 Recessive: no cleft (c)  
 Parents: CC x cc



2. Dominant: dimples (D)  
 Recessive: no dimples (d)  
 Parents: Dd x Dd



3. phenotype 1: \_\_\_\_\_

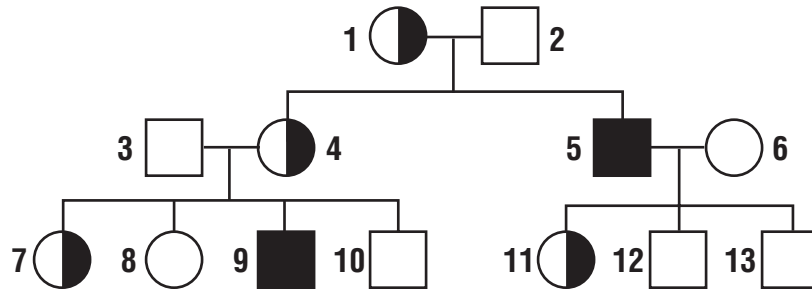
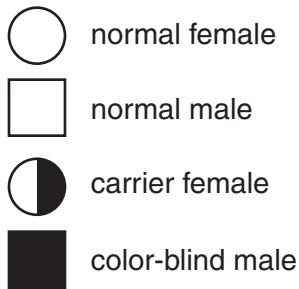
4. phenotype 2: \_\_\_\_\_

## Chapter Test (continued)

**Directions:** One sex-linked trait occurring on the X chromosome is color blindness ( $X^c$ ). Study the pedigree below that shows the occurrence of color blindness in three generations of a family. Use the following to help answer questions 5–9.

X=X chromosome

Y=Y chromosome

 $X^C$ =normal vision $X^c$ =color-blind trait

5. What is the genotype of the first generation female?

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6. What is the genotype of the first generation male?

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7. What is the probability in percent of person 6 passing the color-blind trait?

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8. What is the probability in percent of person 7 passing the color-blind trait?

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9. Person 5 is color-blind. However, his sons do not have this condition. What accounts for this?

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### IV. Writing Skills

**Directions:** Using complete sentences, answer the following question.

10. Explain how scientists have attempted to improve crop plants.

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