

**Chapter 14 The Human Genome**

**Section 14-1 Human Heredity (pages 341-348)**

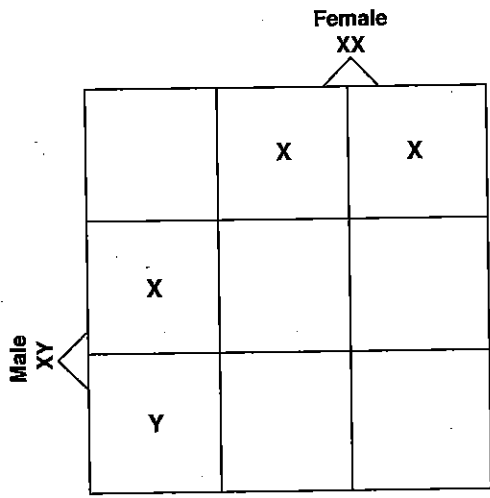
*This section explains what scientists know about human chromosomes, as well as the inheritance of certain human traits and disorders. It also describes how scientists study the inheritance of human traits.*

**Human Chromosomes (pages 341-342)**

1. How do biologists make a karyotype? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

2. Circle the letter of each sentence that is true about human chromosomes.
- a. The X and Y chromosomes are known as sex chromosomes because they determine an individual's sex.
  - b. Males have two X chromosomes.
  - c. Autosomes are all the chromosomes, except the sex chromosomes.
  - d. Biologists would write 46,XY to indicate a human female.

3. Complete the Punnett square below to show how the sex chromosomes segregate during meiosis.



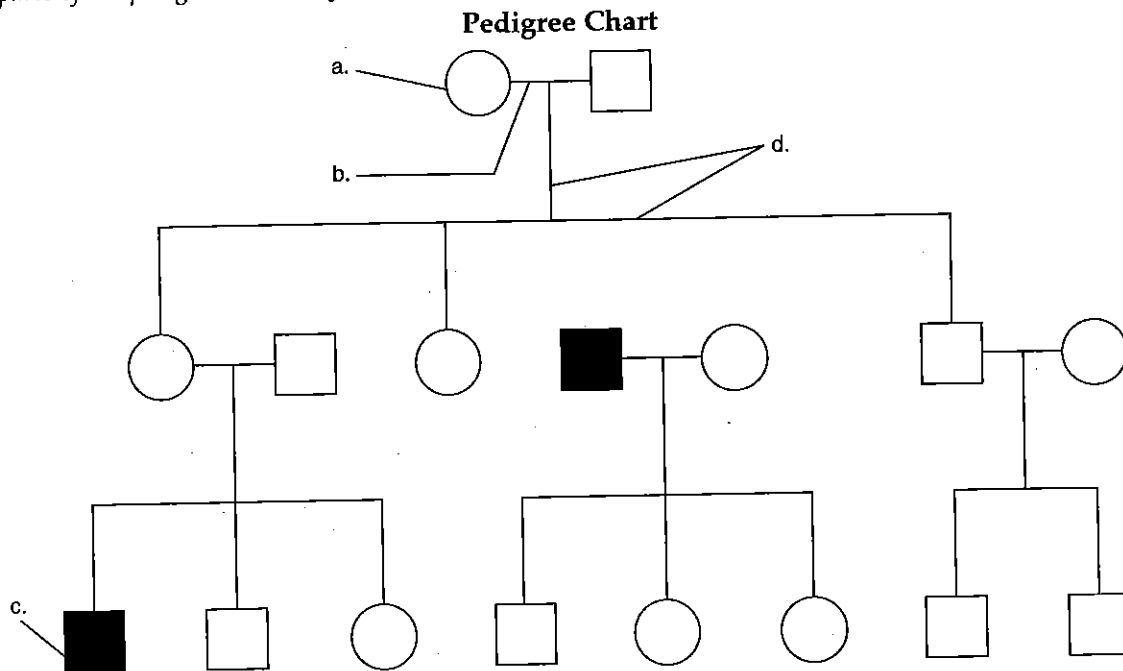
4. Why is there the chance that half of the zygotes will be 46,XX and half will be 46,XY?  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**Human Traits (pages 342-343)**

5. What does a pedigree chart show? \_\_\_\_\_

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Match the labels to the parts of the pedigree chart shown below. Some of the parts of the pedigree chart may be used more than once.



- |  |  |
|--|--|
| ___ 6. A person that expresses the trait       | ___ 9. Represents a marriage               |
| ___ 7. A male                                  | ___ 10. A female                           |
| ___ 8. A person who does not express the trait | ___ 11. Connects parents to their children |

12. Give two reasons why it is impossible to associate some of the most obvious human traits with single genes.

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

**Human Genes (pages 344-346)**

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13. Why is it difficult to study the genetics of humans? \_\_\_\_\_

14. Circle the letter of each sentence that is true about human blood group genes.

- a. The Rh blood group is determined by a single gene.
- b. The negative allele (Rh<sup>-</sup>) is the dominant allele.
- c. All of the alleles for the ABO blood group gene are codominant.
- d. Individuals with type O blood are homozygous for the *i* allele (*ii*) and produce no antigen on the surface of red blood cells.

15. Is the following sentence true or false? Many human genes have become known through the study of genetic disorders. \_\_\_\_\_

**Chapter 14, The Human Genome** (continued)

Match the genetic disorder with its description.

Description	Genetic Disorder
_____ 16. Nervous system breakdown caused by an autosomal recessive allele	a. Phenylketonuria (PKU)
_____ 17. A form of dwarfism caused by an autosomal dominant allele	b. Tay-Sachs disease
_____ 18. A buildup of phenylalanine caused by an autosomal recessive allele	c. Achondroplasia
_____ 19. A progressive loss of muscle control and mental function caused by an autosomal dominant allele	d. Huntington's disease

**From Gene to Molecule** (pages 346-348)

20. What is the normal function of the protein that is affected in cystic fibrosis?
- \_\_\_\_\_
- \_\_\_\_\_
21. A change in just one DNA base for the gene that codes for the protein \_\_\_\_\_ causes sickle-shaped red blood cells.
22. What is the advantage of being heterozygous for the sickle cell allele?
- \_\_\_\_\_
- \_\_\_\_\_
23. What makes an allele dominant, recessive, or codominant? \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_