Chapter 14.The Human Genome.Biology.Landis

Appellation _____

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 46XY to indicate a human female

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

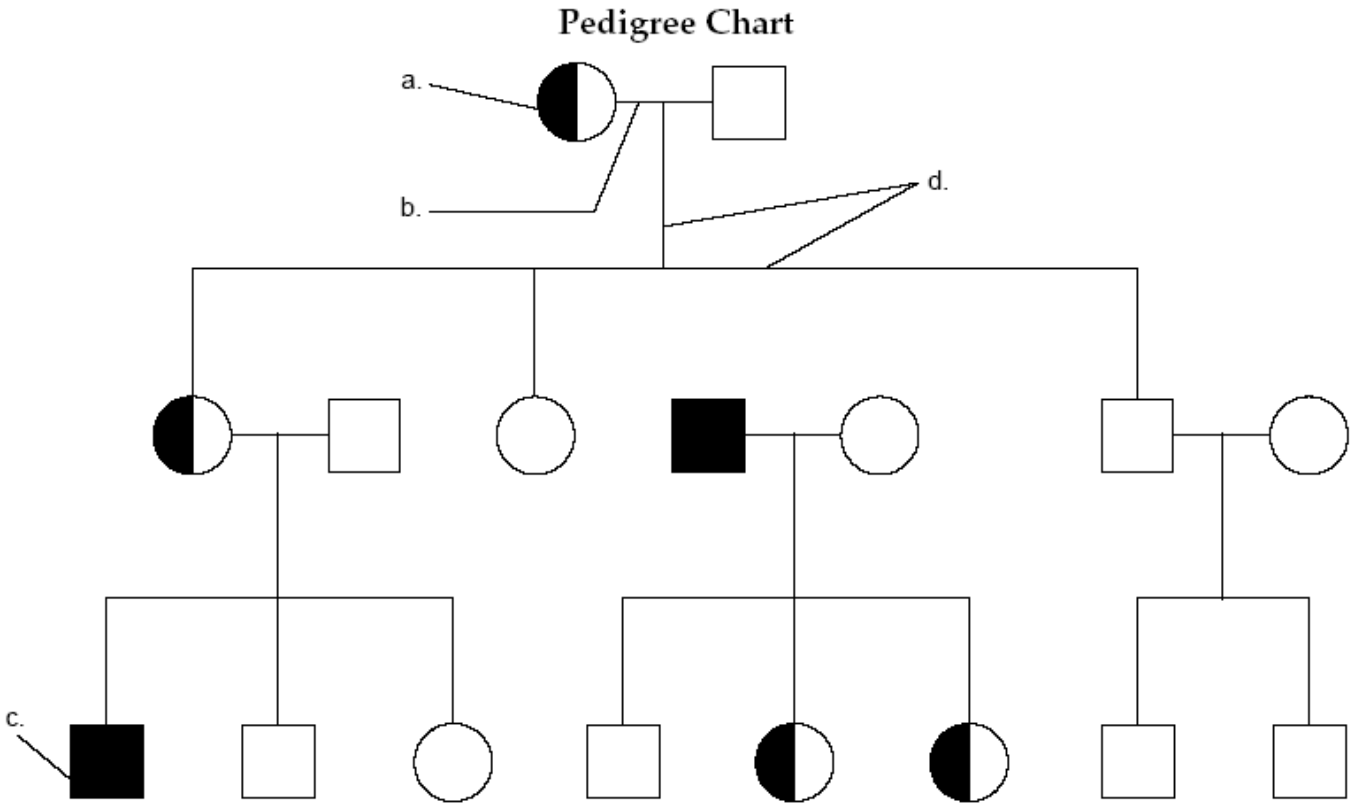
Male (XY) × Female (XX)

	X	X
X		
Y		

Human Traits (pages 342–343)

6. What does a pedigree chart show?

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.



_____ 7. A person that has the trait

_____ 8. A male

_____ 9. A carrier of the trait

_____ 10. Represents a marriage

_____ 11. A female

_____ 12. Connects parents to their children

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

Human Genes (pages 344–346)

14. Why is it difficult to study the genetics of humans?

15. 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–) 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.

Section 14–2 Human Chromosomes (pages 349–353)

This section describes the structure of human chromosomes. It also describes genetic disorders that are sex-linked, as well as disorders caused by nondisjunction.

Human Genes and Chromosomes (page 349)

1. Circle the letter of each sentence that is true about human genes and chromosomes.

a. Chromosomes 21 and 22 are the largest human chromosomes.

b. Chromosome 22 contains long stretches of repetitive DNA that do not code for proteins.

c. Biologists know everything about how the arrangements of genes on chromosomes affect gene expression.

d. Human genes located on the same chromosome tend to be inherited together.

Sex-Linked Genes (pages 350–351)

2. What are sex-linked genes?

3. Is the following sentence true or false? The Y chromosome does not contain any genes at all.

5. Is the following sentence true or false? All X-linked alleles are expressed in males, even if they are recessive.

6. Complete the Punnett square to show how colorblindness is inherited.

$X^CX^c \times X^CY$

	X^C	Y
X^C		
X^c		

10. If you saw a white cat with orange and black spots, could it be a male or a female? **Explain.**

Chromosomal Disorders (pages 352–353)

11. What occurs during nondisjunction?

12. If nondisjunction occurs, what might happen to gametes?

13. The condition in which an individual has three copies of a chromosome is known as _____ , which means "three bodies."

14. What is the cause of Down syndrome?

16. Why does an extra copy of one chromosome cause so much trouble?

17. Circle the letter of each sentence that is true about sex chromosome disorders.

a. A female with the genotype XO has inherited only one X chromosome and is sterile.

b. Females with the genotype XXY have Klinefelter's syndrome.

c. Babies have been born without an X chromosome.

d. The Y chromosome contains a sex-determining region that is necessary for male sexual development.