

Chapter 12

Patterns of Heredity and Human Genetics

Reinforcement and Study Guide

Section 12.1 Mendelian Inheritance of Human Traits

In your textbook, read about making a pedigree.

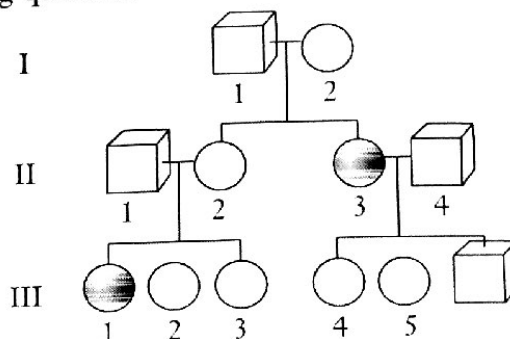
Examine the pedigree to the right. Then answer the following questions.

1. Is the trait being studied in the pedigree recessive or dominant? How do you know?

2. Are II-1 and II-2 carriers of the trait? How do you know?

3. What is the probability that II-1 and II-2 will produce an individual with the trait being studied? Draw a Punnett square to show your work.

4. What is the likely genotype of II-4 for the trait being studied in the pedigree?



In your textbook, read about simple recessive heredity and simple dominant heredity.

For each item in Column A, write the letter of the matching item from Column B.

Column A

Column B

5. Recessive disorder that results from the absence of an enzyme required to break lipids down

a. cystic fibrosis

6. Lethal genetic disorder caused by a dominant allele

b. simple dominant traits

7. Most common genetic disorder among white Americans

c. Tay-Sachs disease

8. Recessive disorder that results from the absence of an enzyme that converts one amino acid into another one

d. Huntington's disease

9. Widow's peak and hitch hiker's thumb

e. phenylketonuria

Chapter 12

Patterns of Heredity and Human Genetics, *continued*

Reinforcement and Study Guide

Section 12.2 When Heredity Follows Different Rules

In your textbook, read about complex patterns of inheritance.

Answer the following questions.

- Complete the Punnett square for a cross between a homozygous red-flowered snapdragon (RR) and a homozygous white-flowered snapdragon ($R'R'$). Give the genotype and phenotype of the offspring in the F_1 generation.

Key

RR - red

$R'R'$ - white

RR' - pink

F_1

genotype: _____

phenotype: _____

- When traits are inherited in an incomplete dominance pattern, what is true of the phenotype of the heterozygotes?

- Complete the Punnett square for a cross between two pink-flowered (RR') F_1 plants. Give the phenotype ratio of the offspring in the F_2 generation.

F_2

phenotype ratio: _____

- In what type of inheritance are both alleles expressed equally?

- Complete the Punnett square for a cross between a black chicken (BB) and a white chicken (WW). Give the phenotype of the offspring in the F_1 generation.

Key

BB - black

WW - white

BW - checkered

F_1

phenotype: _____

**Chapter
12****Patterns of Heredity and
Human Genetics, *continued*****Reinforcement and Study Guide****Section 12.2 When Heredity Follows Different Rules**

For each statement below, write true or false.

- _____ 6. Traits controlled by more than two alleles are said to have multiple alleles.
- _____ 7. Multiple alleles can be studied only in individuals.
- _____ 8. In humans, there are 23 pairs of matching homologous chromosomes called autosomes.
- _____ 9. Two chromosomes called the sex chromosomes determine the sex of an individual.
- _____ 10. The sex chromosomes of a human male are XX, and the sex chromosomes of a human female are XY.
- _____ 11. Traits controlled by genes located on sex chromosomes are called sex-linked traits.
- _____ 12. The first known example of sex-linked inheritance was discovered in pea plants.

In your textbook, read about environmental influences.

Answer the following questions.

- 13.** What characteristics of an organism can affect gene function?

- 14.** Do the internal environments of males and females differ? Explain.

- 15.** What are some environmental factors that can influence gene expression?

- 16.** Give two examples of how an environmental factor can affect the expression of a phenotype.

Chapter
12Patterns of Heredity and
Human Genetics, *continued*

Reinforcement and Study Guide

Section 12.3 Complex Inheritance of Human Traits

In your textbook, read about multiple alleles in humans.

Complete the table by filling in the missing information.

Genotypes	Human Blood Groups Surface Molecules	Phenotypes
1. $I^A I^A$ or $I^A i$	A	
2. $I^B I^B$ or $I^B i$		B
3.	A and B	AB
4.	none	

Complete each statement.

- Blood groups are a classic example of _____ inheritance in humans.
- The alleles _____ are always both expressed.
- The alleles I^A and I^B are _____, meaning they are always both expressed.
- I^A and I^B are dominant to _____.
- Blood typing is necessary before a person can receive a _____.
- A child who inherits I^A from his mother and I^B from his father will have type _____ blood.
- A child whose parents both have type O blood will have type _____ blood.
- If a woman with blood type A has a baby with blood type AB, a man with blood type O _____ be the father.
- Blood tests _____ be used to prove that a certain man is the father of a child.