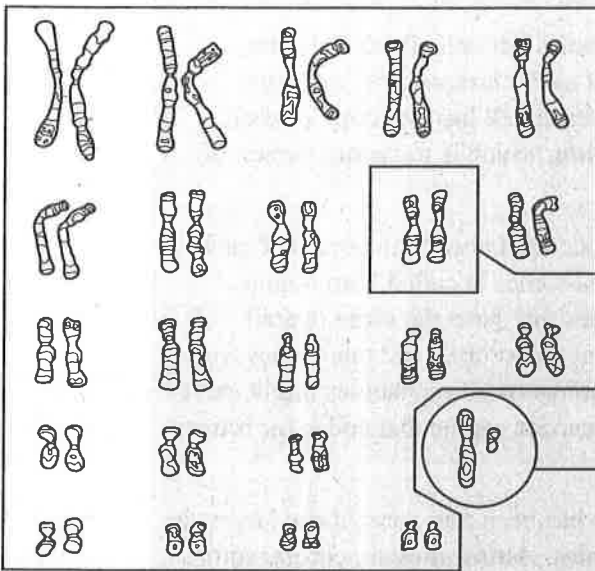


SECTION
6.1

CHROMOSOMES AND MEIOSIS
Power Notes

<p>Somatic cells:</p> <ul style="list-style-type: none"> • also called body cells • make up most of the body tissues & organs • Not passed on to children 	<p>Gametes:</p> <ul style="list-style-type: none"> • sex cells • passed on to children
--	--

Identify the items in the karyotype and explain their characteristics.

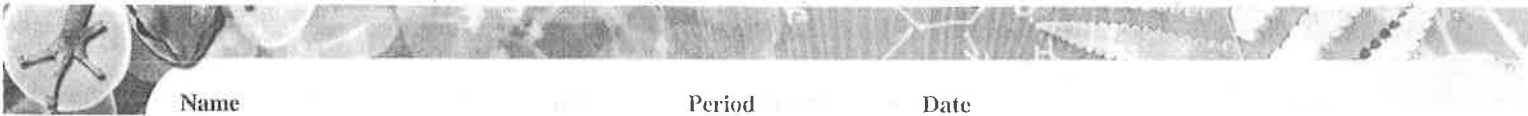


1. Autosomes... chromosomes that contain genes not directly related to the sex of an organism
2. Homologous chromosomes pair of chromosomes, inherit one from each parent, carry the same genes although the genes may code for different traits
3. Sex chromosomes contain genes that directly control the development of sexual characteristics

Diploid cell:
has 2 copies of each chromosome one from mother one from father body cells typically diploid, result from mitosis

Haploid cell:
has one copy of each chromosome gametes typically haploid result from meiosis

<p>Mitosis</p> <ul style="list-style-type: none"> • makes genetically identical cells • makes diploid cells • takes place throughout an organism's lifetime • involved in asexual reproduction 	<p>Meiosis</p> <ul style="list-style-type: none"> • makes genetically unique cells • makes haploid cells • takes place at certain times in life cycle • involved in sexual reproduction
--	---



Name _____

Period _____

Date _____

SECTION

6.1

CHROMOSOMES AND MEIOSIS

Reinforcement

CHAPTER 6
Meiosis and Mendel

KEY CONCEPT Gametes have half the number of chromosomes that body cells have.

Your body is made of two basic cell types. One basic type are **somatic cells**, also called body cells, which make up almost all of your tissues and organs. The second basic type are germ cells, which are located in your reproductive organs. They are the cells that will undergo meiosis and form gametes. **Gametes** are sex cells. They include eggs and sperm cells.

Each species has a characteristic number of chromosomes per cell. Body cells are **diploid**, which means that each cell has two copies of each chromosome, one from each parent. Gametes are **haploid**, which means that each cell has one copy of each chromosome. Gametes join together during **fertilization**, which is the actual fusion of egg and sperm, and restores the diploid number.

The diploid chromosome number in humans is 46. Your cells need both copies of each chromosome to function properly. Each pair of chromosomes is called homologous. **Homologous chromosomes** are a pair of chromosomes that have the same overall appearance and carry the same genes. One comes from the mother, and one comes from the father. Thus, one chromosome from a pair of homologous chromosomes might carry a gene that codes for green eye color, while the other carries a gene that codes for brown eye color.

For reference, each pair of homologous chromosomes has been numbered, from largest to smallest. Chromosome pairs 1 through 22 are autosomes. **Autosomes** are chromosomes that contain genes for characteristics not directly related to sex. The two other chromosomes are **sex chromosomes**, chromosomes that directly control the development of sexual characteristics. In humans, a woman has two X chromosomes, and a man has an X and a Y chromosome. The Y chromosome is very small and carries few genes.

Meiosis is a form of nuclear division that reduces chromosome number from diploid to haploid. Each haploid cell produced by meiosis has 22 autosomes and 1 sex chromosome.

1. How do gametes differ from somatic cells?

2. The prefix *homo-* means “the same.” Explain how this meaning relates to the definition of homologous chromosomes.

3. How does meiosis relate to haploid cells? How does fertilization relate to diploid cells?

Copyright © McDougal Littell/Houghton Mifflin Company

SECTION

6.1

CHROMOSOMES AND MEIOSIS

Study Guide

KEY CONCEPT

Gametes have half the number of chromosomes that body cells have.

VOCABULARY

somatic cell	autosome	fertilization
gamete	sex chromosome	diploid
homologous chromosome	sexual reproduction	haploid
		meiosis

MAIN IDEA: You have body cells and gametes.

1. What are the two major groups of cell types in the human body?

Somatic / body cells germ cells / gametes

2. Where are gametes located?

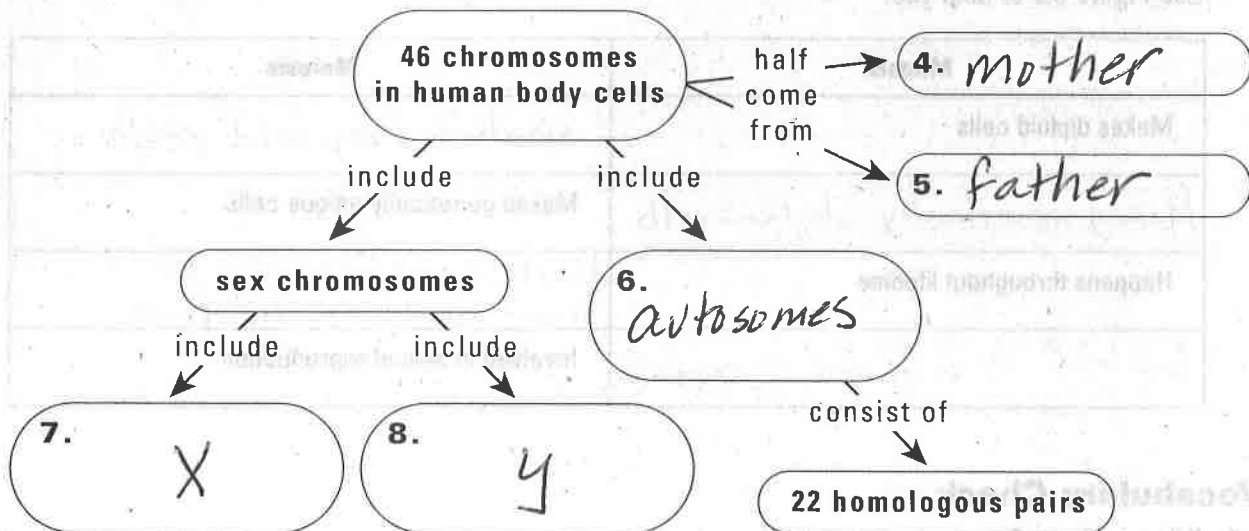
in the reproductive organs ; ovaries and testis

3. How many chromosomes are in a typical human body cell?

46

MAIN IDEA: Your cells have autosomes and sex chromosomes.

Fill in the concept map below to summarize what you know about chromosomes.



STUDY GUIDE, CONTINUED

9. What is the sex of a person with two X chromosomes?

female

10. Which chromosome carries the fewest number of genes?

y chromosome

MAIN IDEA: Body cells are diploid; gametes are haploid.

11. What happens to the nuclei of the egg and sperm during fertilization?

they fuse together

12. What type of cells are haploid?

gametes

13. What is the haploid chromosome number in humans?

23

14. How many autosomes are present in each human gamete? How many sex chromosomes?

22

1

15. Complete the following table to summarize the differences between mitosis and meiosis. Use Figure 6.2 to help you.

Mitosis	Meiosis
Makes diploid cells	makes haploid cells
Makes genetically identical cells	Makes genetically unique cells
Happens throughout lifetime	happens at specific times in an organisms lifetime
Involved in asexual reproduction	Involved in sexual reproduction

Vocabulary Check

16. What are homologous chromosomes?

a pair of chromosomes, one from each parent, have the same genes, length, and overall appearance

17. The word
- soma*
- means "body." How does this relate to the meanings of
- autosome*
- and
- somatic cell*
- ?

directs body traits ; body cell

SECTION

6.2

PROCESS OF MEIOSIS

Study Guide

KEY CONCEPT

During meiosis, diploid cells undergo two cell divisions that result in haploid cells.

VOCABULARY

gametogenesis	egg
sperm	polar body

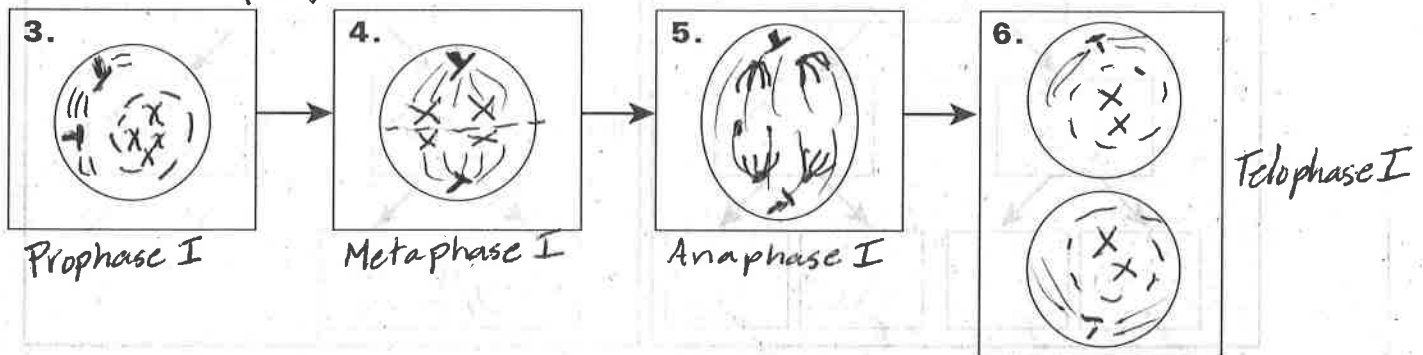
MAIN IDEA: Cells go through two rounds of division in meiosis.

1. After a chromosome is replicated, each half is called a sister chromatid.
2. Two chromosomes that are very similar and carry the same genes are called homologous chromosome.

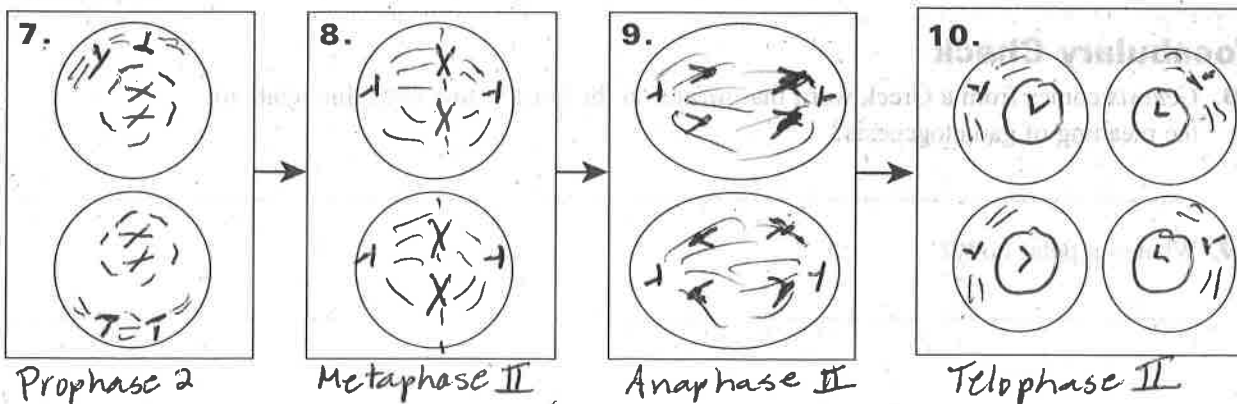
In the space below, sketch the phases of meiosis I and II and write the name of each phase below it. Use Figure 6.5 to help you.

Meiosis I

page 174-175



Meiosis II



11. During which phase do homologous chromosomes separate?

Anaphase I

12. During which phase do sister chromatids separate?

anaphase II

STUDY GUIDE, CONTINUED

MAIN IDEA: Haploid cells develop into mature gametes.

13. What does a sperm cell contribute to an embryo?

DNA

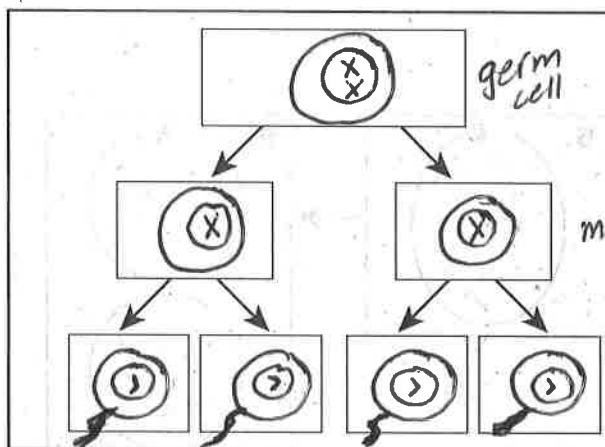
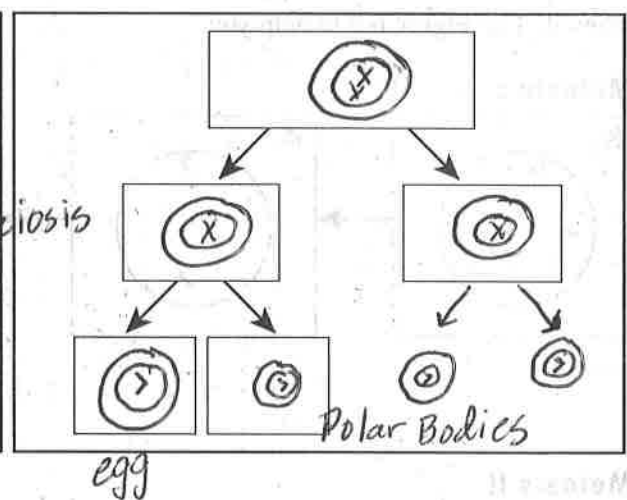
14. What does an egg contribute to an embryo?

DNA, cytoplasm, organelles

15. Where are polar bodies made, in the male or in the female?

female

Complete the diagram of gametogenesis in the boxes below. Use Figure 6.6 to help you.

Sperm Formation**Egg Formation****Vocabulary Check**

- 16.
- Genesis*
- comes from a Greek word that means "to be born." How does this relate to the meaning of gametogenesis?

birth of gametesformation of gametes

17. What is a polar body?

cells produced by meiosis in the female body that contain little more than DNA and are eventually broken down