CHAPTER 7, STUDY GUIDE

CELLULAR REPRODUCTION

Section 7.1 Life from Life - Cells from Cells

In your textbook, read about debating and disproving spontaneous generation.

Use each of the terms below just once to complete the passage:

microorganisms	nonliving	life	Francisco Redi	organisms
Louis Pasteur	biogenesis	air	cell theory	spontaneous generation

Many early scientists performed faulty experiments that convinced them that (1)_____things could give rise to living things. This idea is called (2)_____. In 1668, (3)_____disproved this theory. However, in 1675, the world of (4)_____was discovered, reopening the split between scientists over spontaneous generation.

An experiment performed by (5)_____in 1864 ended the debate. At the time, (6)_____was believed to be necessary for spontaneous generation. Pasteur proved that microorganisms are not spontaneously generated. This work led to the theory of (7)_____, which stated that all organisms are produced from other (8)_____. This tied in with the (9)_____ formulated about the same time. By the late 19th century, scientists worked with these two theories that indicated that all life must come from (10)_____

In your textbook, read about reproduction of body cells.

Answer the following questions.

11. How does the ongoing production of new cells benefit any multicellular organism?

12. What would happen to a cell if it continued to grow unchecked?

13. What is replication? With what does it provide the cell?

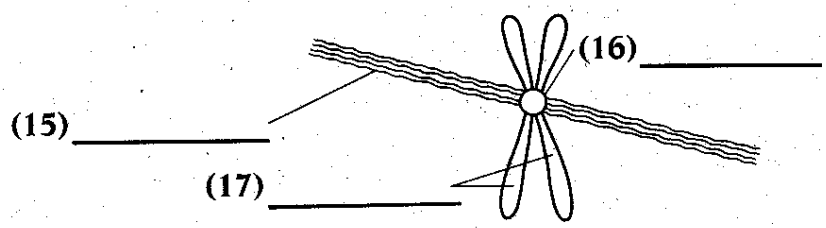
14. What makes up the cell cycle?

CELLULAR REPRODUCTION

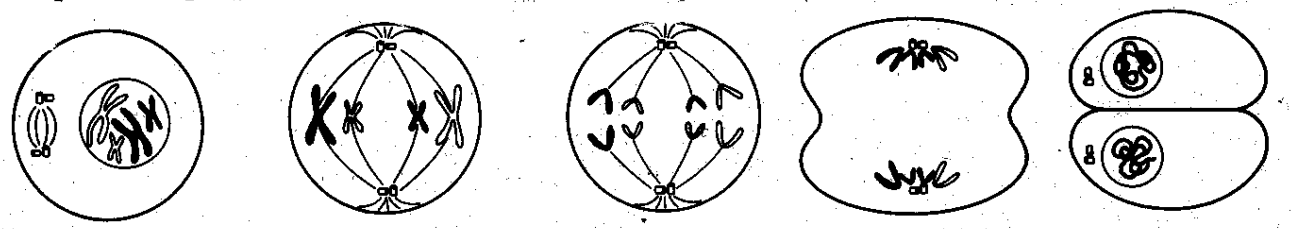
Section 7.1 Life from Life – Cells from Cells continued

In your textbook, read about mitosis.

Label the diagram below of a chromosome during metaphase. Use these choices: centromere, chromatids, microtubules



18. Identify the following stages of cell mitosis. Use these choices:
anaphase prophase telophase metaphase



_____ _____ _____ _____ **daughter cells**

19. Refer to the diagrams in Exercise 18. Is the cell undergoing mitosis an animal cell or a plant cell?

How do you know?

Examine each group of descriptions. Write a name for each group. Use these choices:
anaphase prophase telophase metaphase

20. _____
final stage of mitosis
nucleoli reappear
nuclear membrane forms around
each new set of chromosomes in plants,
cell plate appears

21. _____
chromosomes become attached to the spindle
chromosomes become aligned along the equator

22. _____
nucleoli disappear
nuclear membrane disintegrates
chromosomes become distinct spindle is formed

23. _____
centromeres split
poles move farther apart
sister chromatids are pulled to opposite poles

CELLULAR REPRODUCTION

Section 7.1 Life from Life - Cells from Cells continued

In your textbook, read about control of the cell cycle and cell reproduction in prokaryotes.

Circle the letter of the choice that best completes the statement.

24. Different types of cells divide at
    a. different rates. b. the same rates. c. equal rates. d. different times.

25. Cells that reproduce rapidly are found in the
    a.. nerves. b. muscles. c. bone marrow. d. liver.

26. Rapid division of a cell that invades and disrupts other cells is typical of
    a. interphase. b. cancer. c. biogenesis. d.spontaneous generation.

27. A factor that influences cell division is
    a. time of day. b. size of chromosomes.
    c. number of chromosomes. d. cell-to-cell contact.

28. Cells stop dividing at the point in the cell cycle
    a. before DNA replication. b. after DNA replication.
    c. during prophase. d. during metaphase.

29. A protein that controls the onset of mitosis in frog eggs is present during
    a. interphase. b. prophase. c. metaphase. d. telophase.

30. Once the control protein in frog eggs is activated, it acts as a(n)
    a. inhibitor. b. shunt. c. enzyme. d. energy source.

31. The separation of chromatids does not take place until all chromosomes
a. are in the nucleus. b. have disappeared.
c. are attached to the spindle fibers. d. are lined up with the cell plate.

32. Order the steps in binary fission from 1 to 7.

_____A duplicate chromosome is formed.

_____More new membrane and cell wall form and push inward at the midpoint of the length of the cell.

_____Two separate daughter cells are produced.

_____The single chromosome is attached to the inside of the cell membrane.

_____The new chromosome attaches to the cell membrane.

_____The two chromosomes become separated.

_____Growth of new cell membrane and cell wall material separates the two copies of the chromosome and elongates the cell.

CELLULAR REPRODUCTION

Section 7.2 Production of Reproductive Cells

In your textbook, read about chromosome numbers and characteristics, and meiosis rather than mitosis.

Determine if the statement is true. If it is not, rewrite the italicized part to make it true.

1. The number of chromosomes in an organism *changes* from generation to generation.
2. All the body cells of an organism have a *different* number of chromosomes.
3. Ani*mals and flowering plants* have paired chromosomes.
4. Human body cells have 46 *pairs* of chromosomes.
5. Cells having two of each chromosome are *haploid* cells.
6. The diploid number of chromosomes is represented by *the letter n*.
7. The *diploid* number of chromosomes in humans is 23.
8. Two members of a pair of chromosomes are *haploid* chromosomes.
9. When two organisms mate, they produce a single fertilized egg called a *zygote*.
10. A zygote results from the union of sex cells, or *eggs*.
11. Meiosis occurs in *all body cells*

Complete the table by answering each of the following questions about the egg, sperm, and zygote in human fertilization

	Egg	Sperm	Zygote
12. Is it a gamete or a fertilized egg?			
13. What is the number of chromosomes it contains?			
14. Is the number of chromosomes the haploid or diploid number?			
15. Is the cell represented by *n* or *2n?*			
16.Is it produced as the result of meiosis?			
17. Is it produced as the result of fertilization?			

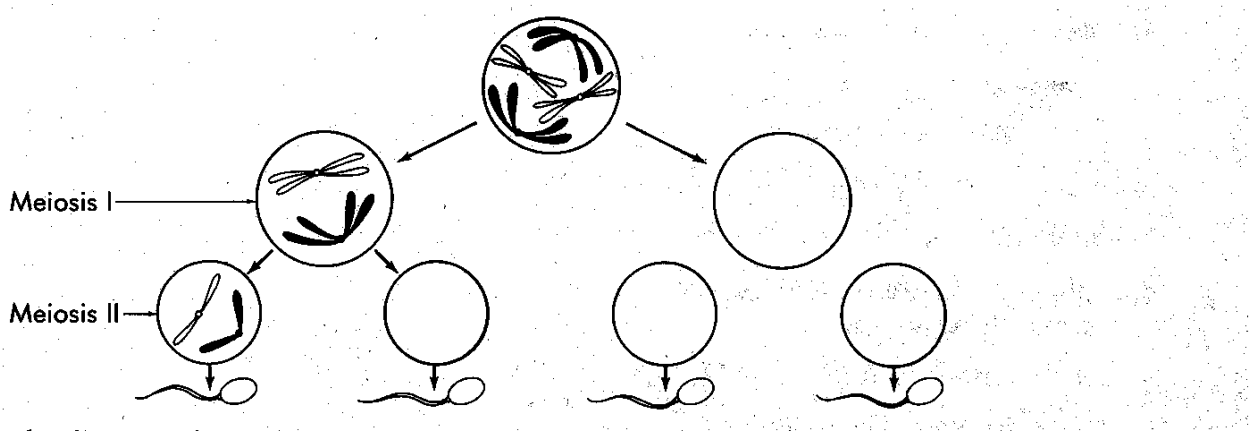
CELLULAR REPRODUCTION

Section 7.2 Production of Reproductive Cells continued

In your textbook, read about meiosis in male animals, meiosis in female animals, and the importance of meiosis.

Examine the diagram below that shows a cell undergoing meiosis.

18. Draw the missing chromosomes in the empty circles.



19. Does the diagram above show meiosis in a male or in a female? What type of gametes are produced?

Write the name of the type of cell division the statement describes. Use these choices:

mitosis meiosis mitosis and meiosis

20. Produces haploid cells.
21. Occurs in all body cells.
22. Produces diploid cells.
23. Allows for genetic continuity.
24. Results in the production of four sperm cells.
25. Results in the production of one egg cell.
26. Occurs in animals and flowering plants.
27. Involves two cell divisions.

Answer the following questions.

28. How is variation important to a species?

29. What determines how chromosomes are combined in gametes?

CELLULAR REPRODUCTION

Chapter 7 Vocabulary

Review the new words in Chapter 7 of your textbook.

Use the clues at the left to write each numbered term. Then identify the boxed term.

1. fertilized egg

2. second stage of mitosis

3. region where two chromatids join

4. final stage of mitosis

5. fusion of egg and sperm

6. non-reproducing stage of the cell cycle

7. interphase and mitosis, together

8. either of two strands that together form a chromosome

9. result of meiosis in plants and fungi

10. forms the plasma membrane of two new plant cells

11. first stage of mitosis

12. either of the two kinds of sex cells

13. cell reproduction in prokaryotes

14. process by which gametes are formed from diploid nuclei

15. structure located between the centrioles of a cell

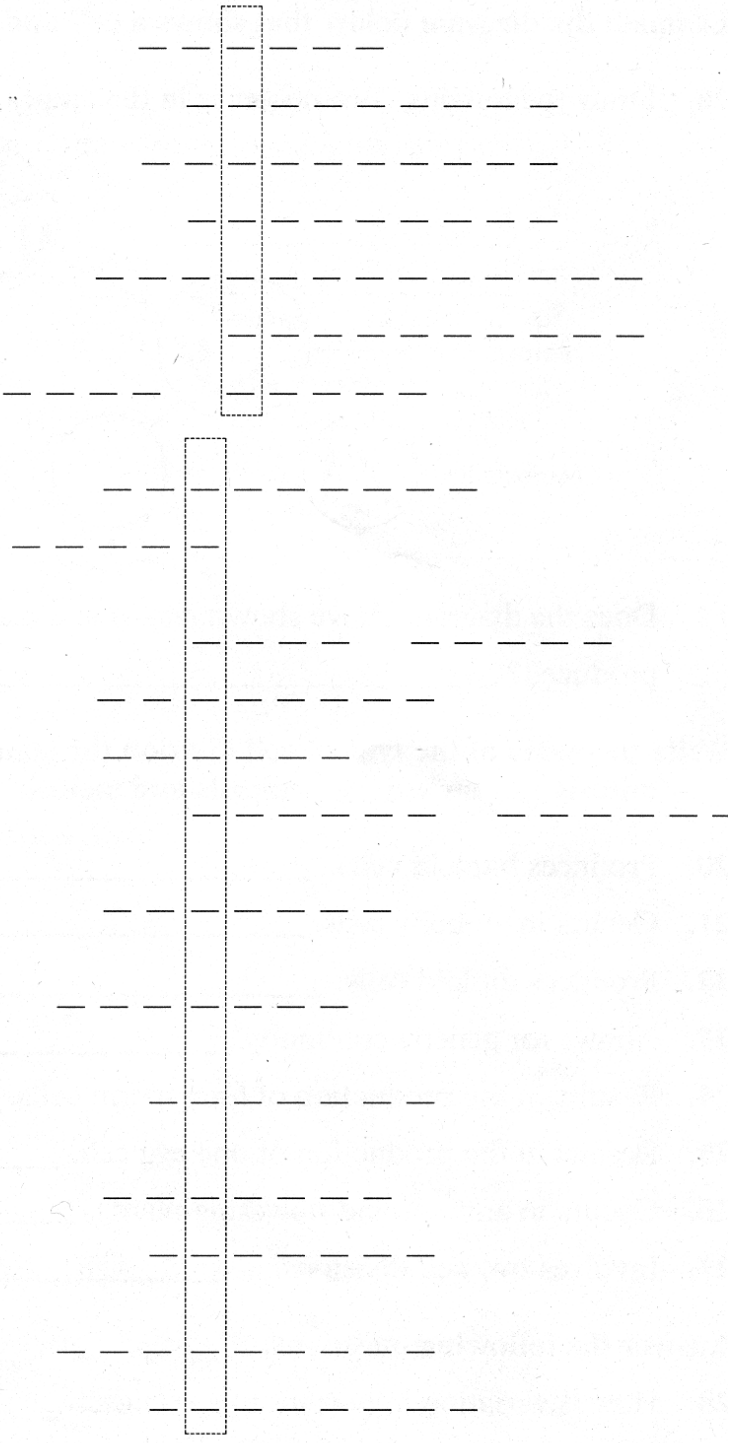
16. containing one chromosome of each homologous pair

17. part of the cell cycle usually accompanied by cell division

18. having two of each chromosome

19. each of two chromosomes with identical structures

20. third stage of mitosis



Write the boxed term. _____

What does the boxed term mean? _____