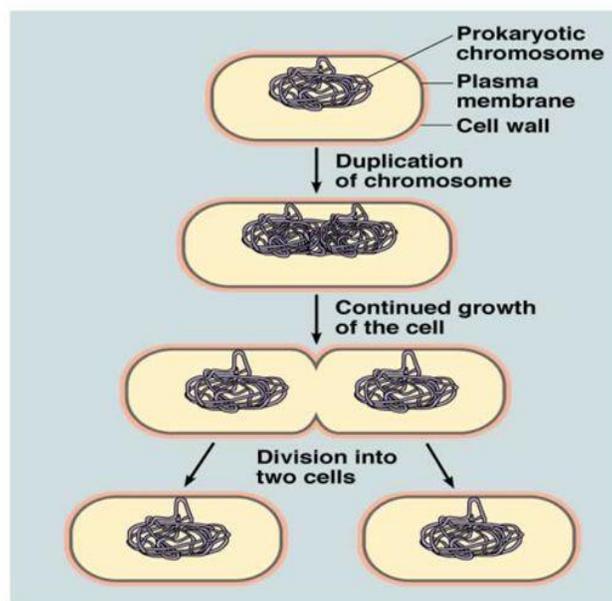




LESSON 2

Results of cell Division:

The cell cycle results in two new cells. These daughter cells are genetically identical to each other and to the original cell that no longer exists. This is how organisms grow and develop. Even when an organism stops growing, cells still divide at times. When a bone is broken, bone cells divide and make new cell that mend the break. When skin is cut, skin cells divide and make new cells to heal the wound. When you are ill, your body makes special cells to fight the infection. The new cells are made by the process of cell division.



The cell cycle is important for reproduction in some organisms, growth in multicellular organisms, replacement of worn out or damaged cells, and repair of damaged tissues. In some unicellular organisms, cell division is a form of reproduction. Cell division is also important in other methods of reproduction in which the offspring are identical to the parent organism. Cell division allows multicellular organisms, such as humans, to grow and develop from one cell (a fertilized egg). In humans, cell division begins about 24 hours after fertilization and continues rapidly during the first few years of life. It is likely that during the next few years you will go through another period of rapid growth and development. This happens in number as you grow and develop. Even after an organism is fully grown, cell division continues. It replaces cells that wear out or are damaged. The outermost layer of the skin is always rubbing or flaking off. A layer of cells below the skin's surface is constantly dividing. This produces millions of new cells daily to replace the ones that are rubbed off. Cell division is also critical for repairing damage. When a bone breaks, cell division produces new bone cells that patch the broken pieces back together. Not all damage can be repaired, however, because not all cells continue to divide. Injuries to nerve cells often cause permanent damage.

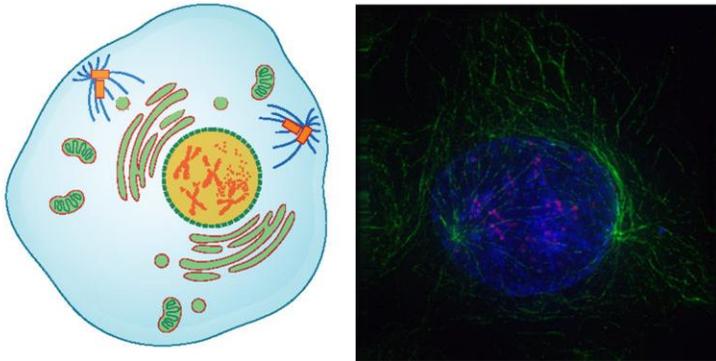
Diploid cells: following fertilization, a zygote goes through mitosis and cell division. These processes produce nearly all the cells in a multicellular organism. Organisms that reproduce sexually form two kinds of body cells and sex cells. In body cells of most organisms, similar chromosomes occur in pairs. Diploid cells are cells that have pairs of chromosomes. Homologous are pairs of chromosomes that have genes for the same traits arranged in the same order.

Haploid cells: organisms that reproduce sexually also form egg and sperm cells, or sex cells have cells have only one chromosomes from each pair of chromosomes.

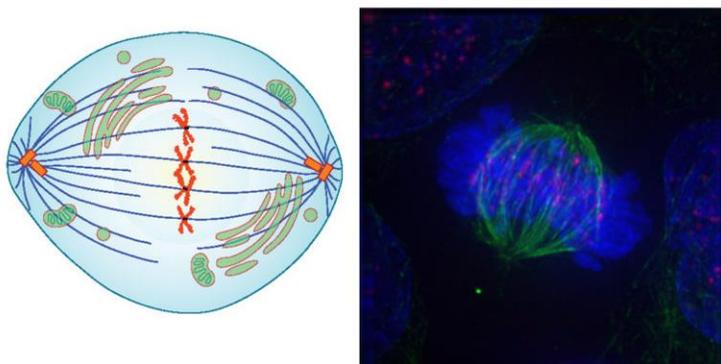
Haploid cells are cells that have only one chromosome from each pair. In meiosis, one diploid cell divides and makes four haploid sex cells. Meiosis occurs only during the formation of sex cells. Organisms produce sex cells using a special type of cell division called meiosis.

The phases of meiosis: the phases of meiosis I a reproductive cell goes through interphase before beginning meiosis I

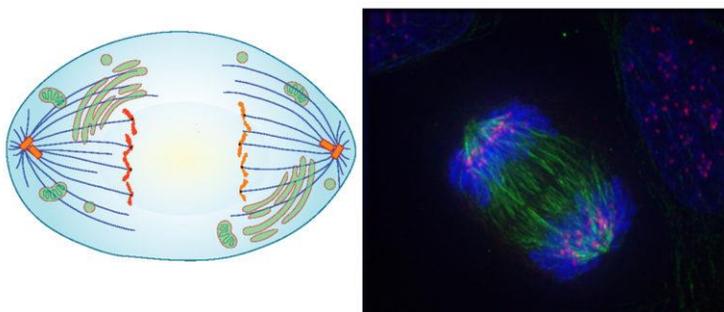
Prophase I- nuclear membrane breaks apart. Chromosomes condense and form homologous pairs.



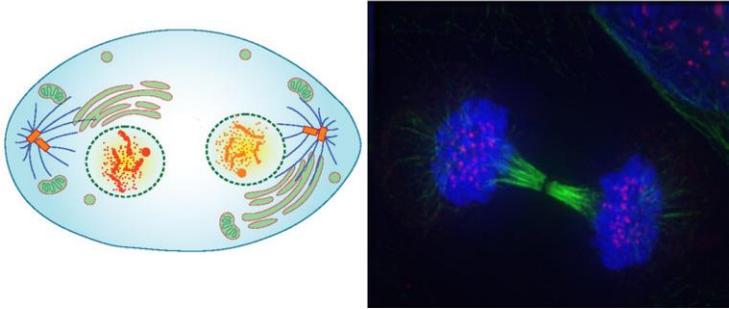
Metaphase I homologous chromosome pair line up along the center of the cell. Spindle fibers attach to each chromosome.



Anaphase I chromosomes pairs separate and are pulled toward the opposite ends of the cell. Notice that the sister chromatids stay together.



Telophase I a nuclear membrane forms around each group of duplicated chromosomes. The cytoplasm divides, forming two daughter cells.



CHECK YOUR UNDERSTANDING

A. Encircle the letter of the correct answer.

1. _____ happens when pairs of sister chromatids align at the center of the cell.

- a. prophase
- b. Anaphase
- c. Telophase
- d. Metaphase

2. which of the following is NOT part of mitosis?

- e. anaphase
- f. interphase
- g. prophase
- h. telophase

3. A nuclear envelope forms around each set of sister chromatids in _____.

- i. prophase
- j. anaphase
- k. telophase
- l. metaphase

B. answer the following questions:

1. what are sister chromatids? (2points)

2. How do the events in the cell cycle ensure that each new cell will be genetically identical to the original cell? (5points)

3. How does the DNA content of the cell change from prophase to telophase? Does the number of chromatids change? Explain. Does the number of chromosomes change? Explain. (10points)
