



Mitosis

- Define “cell division.” Cell division is a process that gives rise to new cells from a single mother cell.
- What are the two types of cell division that occur in humans?
 - Mitosis
 - Meiosis

Mitosis and its functions

- Define “mitosis.” Mitosis is the process of cell division through which two genetically identical somatic cells are created from the original somatic cell (mother cell).
- Summary table of the functions of mitosis

Functions	Benefits
Ensures <u>growth of the organism</u>	<ul style="list-style-type: none"> <u>For our bodies to grow, the number of cells contained in our bodies must increase.</u> <u>Growth occurs through mitosis as the number of cells multiplies.</u>
Ensures <u>cellular regeneration</u>	<ul style="list-style-type: none"> <u>Replacement of cells that have died or are worn down</u> <u>Repair areas of the body that have been accidentally damaged</u>

- Some cells do not have the ability to reproduce. What are they called? Amitotic cells
 - Provide an example of cells that are unable to reproduce. Neurons that make up nerves, as well as the nerve cells of the spinal cord and brain

The process of mitosis

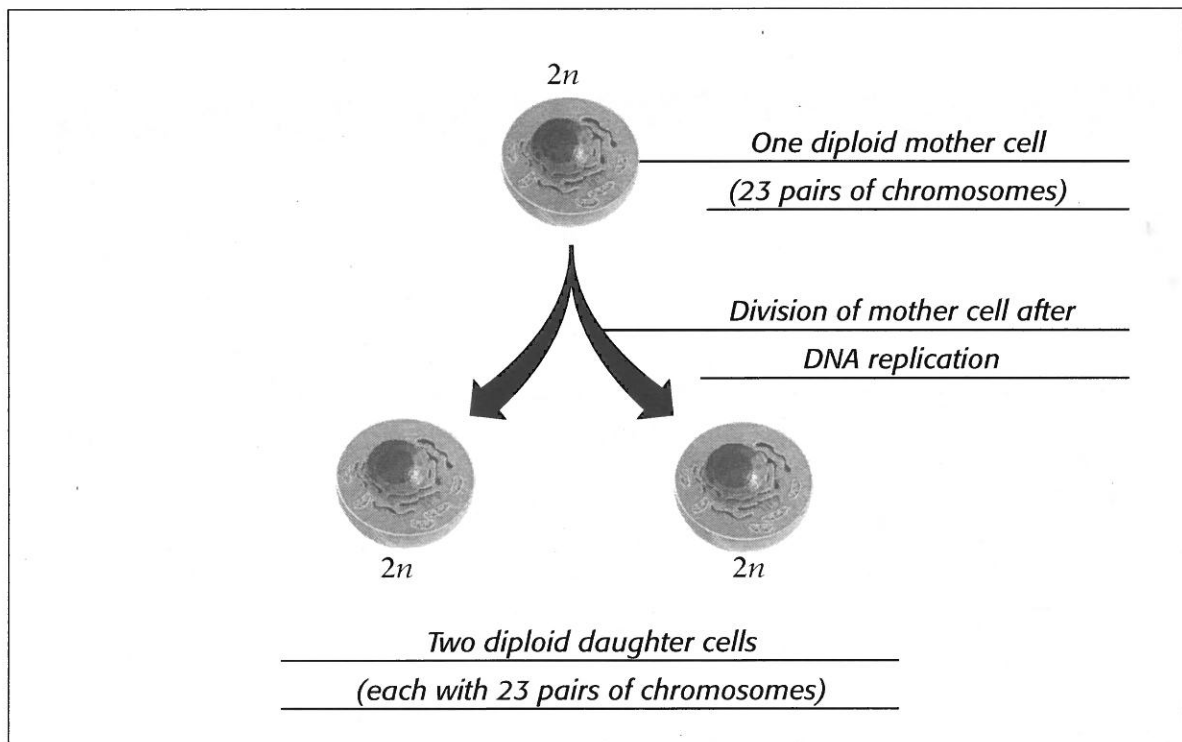
6. During which process does the mother cell make a copy of the DNA in its nucleus?

DNA replication

7. Complete the following sentences:

During replication, the DNA molecule uncoils and the ladder separates into two pieces, like a zipper. New nitrogen bases manufactured in the cytoplasm attach to each of the separated strands. Two new DNA molecules are formed, identical to the original. After DNA replication occurs, the cell has a copy of each of the 46 chromosomes that were present at the beginning.

8. Complete the following simplified diagram of mitosis:



9. During mitosis, the genetic information divides in two and forms two new nuclei. The mother cell divides in two to form two new cells. Each daughter cell possesses 23 pairs of chromosomes that are genetically identical to those of the mother cell.



Meiosis and Sexual Development

Meiosis and its function

1. Define “meiosis.” A form of cell division producing four reproductive cells that are genetically different from the original somatic cell
2. Fill in the words missing from the following paragraph:
Following meiosis, each of the four daughter cells contains half of the genetic information of the mother cell. Meiosis therefore produces cells that have only one chromosome from each pair, which, in the case of humans, is 23 chromosomes.
3. Organs of the human body in which meiosis occurs: Ovaries and testicles
4. Function of meiosis: The production of reproductive cells allowing for sexual reproduction
5. The male gamete (reproductive cell) is called: A spermatozoon
6. The female gamete (reproductive cell) is called: An ovum

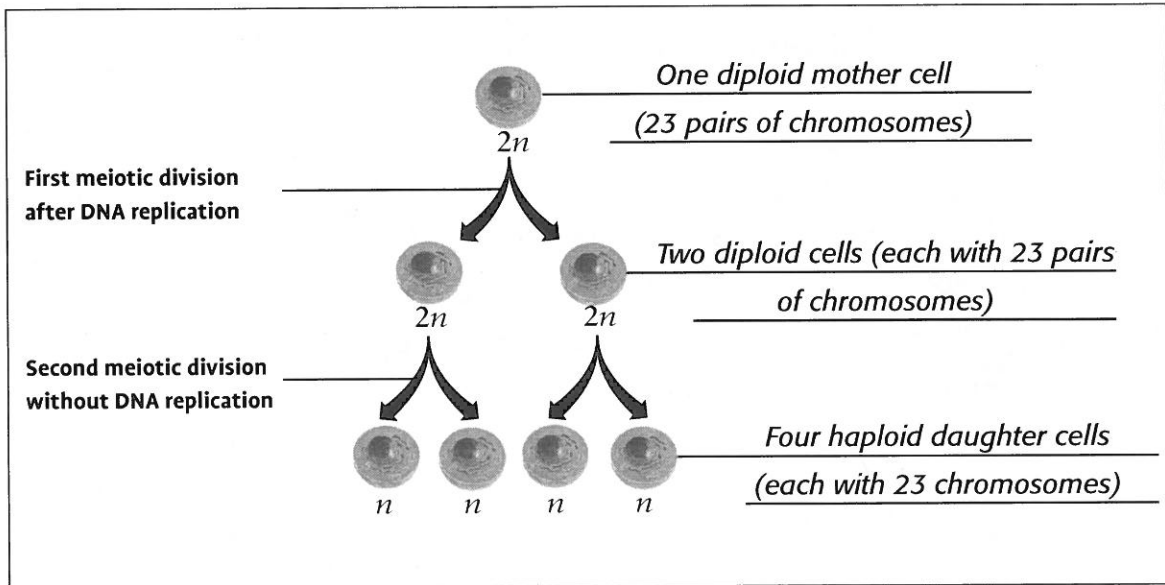
The process of meiosis

7. Complete the following sentences:

In order to produce daughter cells containing 23 chromosomes, the mother cell must divide twice. The first division is very similar to mitosis. After replication of the DNA contained in the nucleus, two cells are formed, each containing 23 pairs of chromosomes.

Next, each cell divides a second time, but without DNA replication. Each cell randomly distributes a single set of chromosomes from each of its 23 pairs to its two daughter cells. The process results in four daughter cells that are genetically different from each other, each containing 23 chromosomes.

8. Complete this simplified diagram of meiosis:



Sexual development in humans

9. Define "fertilization." Fusion of genetic material from a spermatozoon with that of an ovum

10. Complete the following simplified diagram of sexual development in humans:

