

Chapter 2:

Meiosis and the production of gametes

TB - Ch. 12, p. 275

Sep 12-2:03 PM

Meiosis

Meiosis is a form of cell division during which the number of chromosomes is reduced by half, resulting in a specialized cell called a gamete.

Gametes are an organism's sex cells. Two cells from separate parents will fuse and create a new cell that contains double the amount of chromosome than the gametes, otherwise known as the "full set".

Human male gamete: sperm cell
Human female gamete: egg cell

Sep 12-2:36 PM

The role of chromosomes

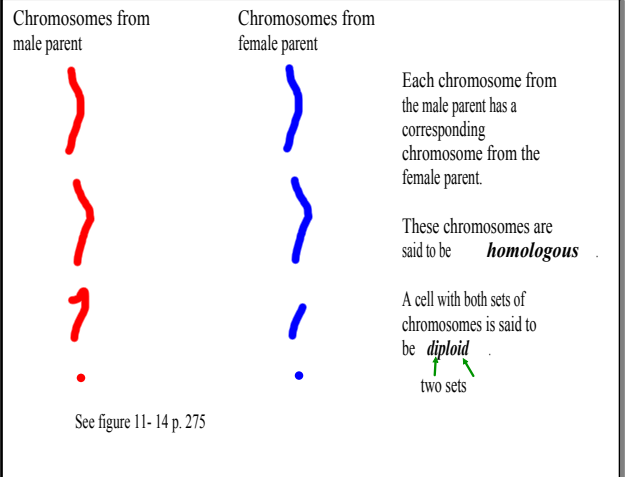
Each species has a specific number of chromosomes in it's cells. Humans, for example, have 46 chromosomes.

A closer look at the fruit fly:

Fruit flies have 8 chromosomes, which makes them ideal as simple study objects.

4 chromosomes come from the male parent
4 chromosomes from from the female parent. } Total: 8

Sep 12-2:06 PM



Sep 12-2:13 PM

Diploid cells are represented by the expression $2n$, meaning 2 sets of chromosomes. This is a full set of genes.

In fruit flies, $2n = 8$.
In humans, $2n = 46$.

Organisms need to be able to create a specialized cell for reproduction. These cells are called **gametes** and contains only 1 set of chromosomes. This is a **haploid** cell.

Haploid cells are represented by the expression n , meaning one set of chromosomes. This is a half a set of genes.

In fruit flies, $n = 4$
In humans, $n = 23$.

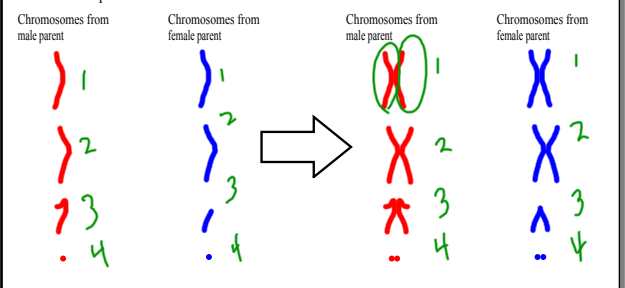
Sep 12-2:24 PM

Phases of meiosis

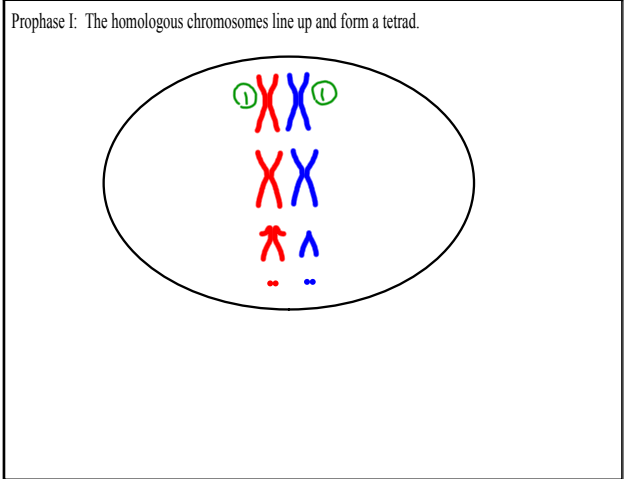
See figure 11 - 15, p. 276 for a summary of the following steps.

Meiosis happens in 2 distinct phases:

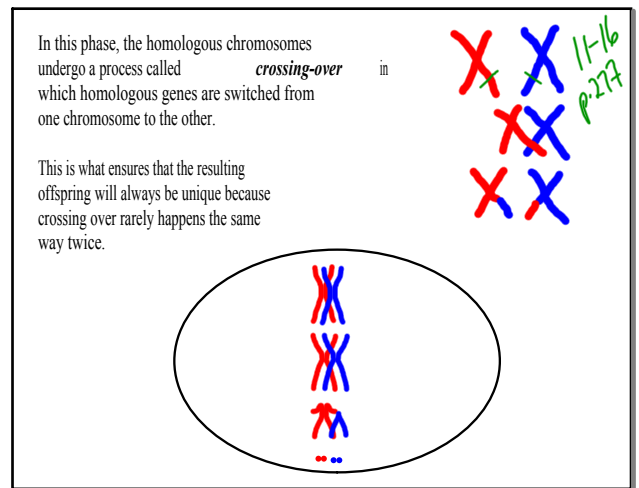
In meiosis I, the cell goes through each step of cell cycle, beginning with DNA replication.



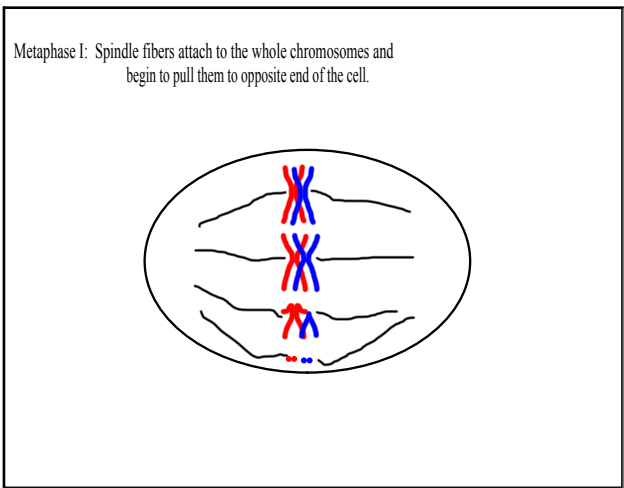
Sep 12-2:47 PM



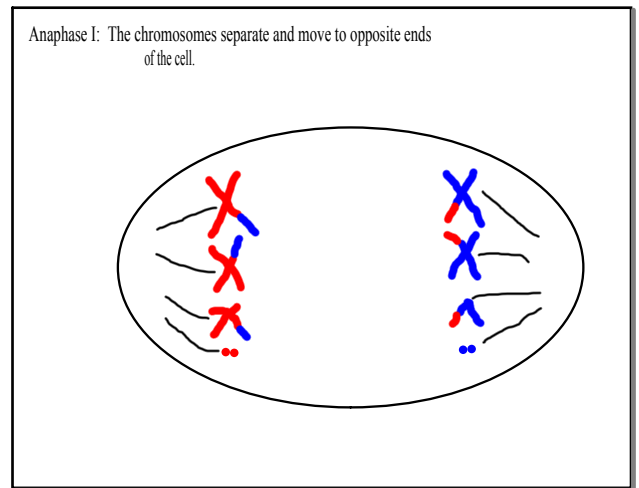
Sep 12-2:52 PM



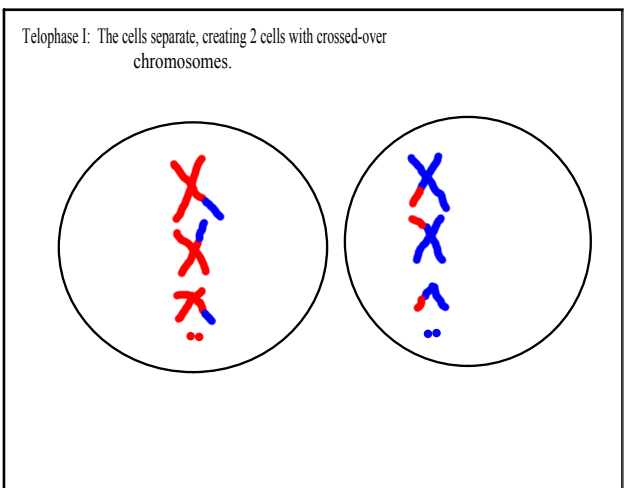
Sep 12-2:55 PM



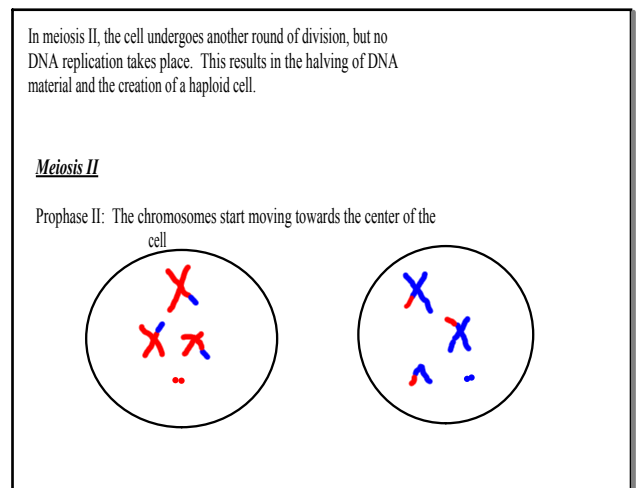
Sep 12-3:01 PM



Sep 12-3:20 PM

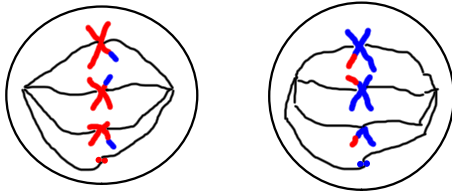


Sep 12-3:21 PM



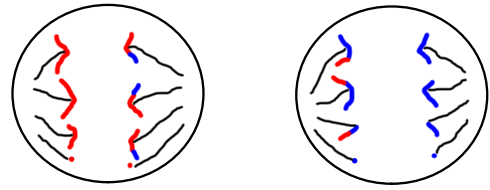
Sep 12-3:04 PM

Metaphase II: The chromosomes line up in the center of the cell and the spindle fibers attach to the centromeres of each chromosome.



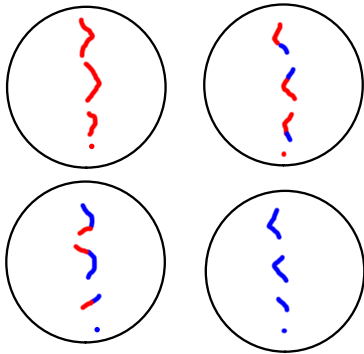
Sep 12-3:32 PM

Anaphase II: The individual chromatids are separated from one another, and move to opposite ends of the cell.



Sep 12-3:34 PM

Telophase II: The cells separate, resulting in four haploid cells, each containing different genetic information than each other and the original cell.



Sep 12-3:36 PM

Interactive meiosis diagram

<http://www.phschool.com/webcodes10/index.cfm?fuseaction=home.gotoWebCode&wcprefix=cbp&wcsuffix=4114>

Sep 12-7:38 PM

Assignment:

Read through the section titled: "Comparing mitosis and meiosis" on page 278. Make your own notes (2 - 3 sentences max.)

Sep 12-3:46 PM