Meiosis

Somatic Cells – A majority of the cells in your body; they are referred to as Diploid (2n), meaning that they have a full set of DNA

Gametes – These are the sex cells. They are the sperm and egg cells.; They are referred to as Haploid(n), meaning they have only half the DNA. This is to allow for a full complement of DNA after fertilization.

Homologous Chromosomes - 2 chromosomes that are the same size, shape, and physical appearance. They have copies of the same genes; one is from the mother and the other from the father.

Autosomes – all the chromosomes except for the sex chromosomes (x or y) which determine the sex of the individual. Autosomes are assigned a number for identification.

Sexual Reproduction – fusion of two gametes that results in the formation of offspring that has a genetic mixture of both parents. This fusion of gametes is a process specifically called: Fertilization

Meiosis happens in 2 stages of cell division; Meiosis I & Meiosis II

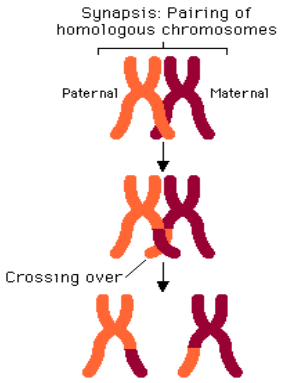
In Meiosis I, The division results in 2 cells that are each haploid. In Meiosis II, those 2 cells from meiosis I are further divided to separate sister chromatids, resulting in a total of 4 daughter cells from 1 original cell.

<u>Spermatogenesis</u> – Formation of sperm; the 2 divisions produce 4 equally sized cells.

<u>Oogenesis</u> – Formation of the egg cell. Egg cells are Large cells. To make these cells, the divisions do not separate the cytoplasm equally, producing 3 <u>polar bodies</u> and 1 egg cell by the end of the process.

<u>Genetic Variation in Meiosis:</u>

1. **<u>Crossing Over</u> – When Homologues align next to each other During Prophase, a structure called a <u>tetrad</u> is formed; genetic Material from non-sister Chromatids is exchanged , and the 2 sister chromatids of 1 chromosome are no longer identical**



2. **<u>Independent Assortment</u> – The Order in which the maternal and paternal homologous chromosomes align on the equator during metaphase I is random, and each pair orders itself independently of the others. This produces gametes that each have a random grouping of maternal and paternal chromosomes.**
   a. **The number of possible combinations of gametes can be calculated as $2^{(\text{\# of homologous pairs})}$**
      1. **EX: for a cell with 6 chromosomes, there are 3 pairs. $2^3 = 8$; so there are 8 possible combinations of gametes that can be formed.**