Concept 9.5

Meiosis functions in sexual reproduction.

Homologous Chromosomes:

Meiosis - a type of cell division that produces four cells, each with half the number of chromosomes as the parent cell.

Karyotype - a display of the chromosomes of an individual.

Homologous chromosomes - The two chromosomes of each matching pair. One chromosome of each pair comes from the mother and the other from the father.

Sex chromosomes - 23rd pair of chromosomes, which determines the person's sex.

X X = Female
X Y = Male

Diploid and Haploid Cells:

Diploid - cells that contain two homologous sets of chromosomes

Diploid number = 2n (as in 2n = 46)

The exceptions are egg and sperm cells, known as

sex cells, or **gametes**. Each gamete has a single set of chromosomes called a **haploid** cell.

Haploid number = n (as in n = 23)

These haploid cells are produced through the process of meiosis.

Fertilization - The fusion of the nuclei and cytoplasm of an haploid sperm and egg cell.

Zygote - the fertilized egg which is diploid and has two homologous sets of chromosomes, one from each parent.

The Process of Meiosis:

Original diploid cell

2n

n n Meiosis I

n n n n Meiosis II

4 haploid cells

Meiosis Versus Mitosis

Meiosis
- Produces four new offspring cells with one set of chromosomes.
- involves exchange of genetic material between homologous chromosomes. (crossing over)

Mitosis
- produces two offspring cells, each with the same number of chromosomes as the parent cell.