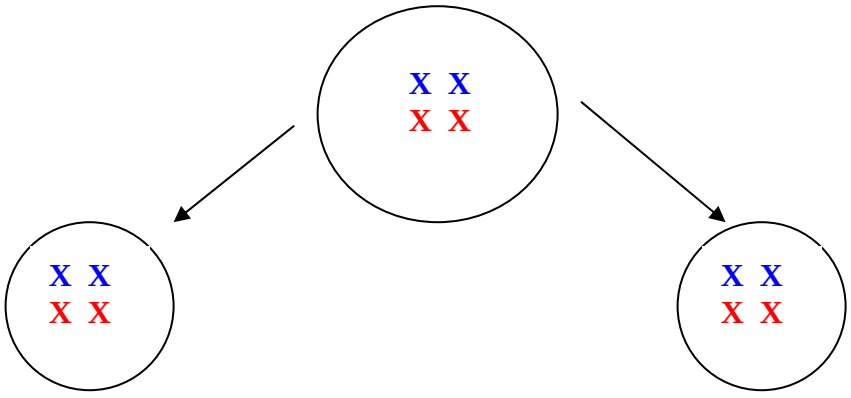
Mitosis and Meiosis

- All cells produced through mitosis have the ***same number of chromosomes*** as their parent cells.
- In addition, the genetic material is ***identical*** in these daughter cells.
- Most of the cells in our body are called ***somatic*** cells.
- Every somatic cell in the body of a multicellular organism has the same number of chromosomes.
- The chromosomes in somatic cells occur in pairs called ***homologous chromosomes***.
- ***Homologous*** means "the same".
- Humans have ***46*** chromosomes in their somatic cells, forming ***23 homologous pairs.***
- Cells that have homologous chromosomes are said to have the ***diploid*** number of chromosomes, (2n).



➔ A gamete, however, has only ONE member from each pair of homologous chromosomes of its parent cell.

➔ Gametes (egg and sperm cells) have half the diploid number, or the ***haploid*** number, (n).

➔ Gametes are formed by a type of division called **MEIOSIS.**

➔ ***Meiosis reduces the number of chromosomes to half the number found in somatic cells.***

Phases of Meiosis

☺ In meiosis, there are TWO successive cell divisions, meiosis I and meiosis II.

☺ During meiosis I, the homologous chromosomes separate.

☺ During meiosis II, the chromatids of each chromosome separate.

	Cell Division	**# of daughter cells**	**Parent cell type**	**Daughter cell type**	**Genetic likeness of daughter cells to parent**
MITOSIS	1	2	Diploid	Diploid	identical
MEIOSIS	2	4	diploid	haploid	different

MEIOSIS I

- ✪ Just like in mitosis, meiosis I is preceded by the synthesis of DNA and replication of the chromosomes.

- ✪ During meiosis I, the homologous chromosomes come together. This is called ***synapsis.***

- ✪ They lie next to each other, forming a structure called a ***tetrad.***

- ✪ Meiosis I can be divided into the same four phases as mitosis.

- ✪ At the end of meiosis I, each daughter cell contains HALF the number of chromosomes found in the parent cell.

- ✪ One chromosome of each homologous pair is present in each daughter cell.

- ✪ Meiosis I is ***REDUCTIVE DIVISION***; it reduces the number of chromosomes from the diploid (2n) to the haploid (n).

MEIOSIS II

- ✪ Each daughter cell produced in meiosis I undergoes another division in meiosis II.

- ✪ Meiosis II is similar to mitosis but is NOT preceded by the replication of DNA.

- ✪ Meiosis II also has four stages

- ✪ Each of the daughter cells formed in meiosis I has divided in two

- ✪ This results in a total of FOUR daughter cells produced in meiosis II.

- ✪ Each of the daughter cells produced in meiosis II is haploid.