

MISTAKES IN MEIOSIS

SBI 3C: NOVEMBER

MISTAKES IN SEPARATION:

- ▶ **Aneuploidy:**

- ▶ Error during meiosis
- ▶ Separation of chromosomes doesn't take place properly resulting in cells have too many or too few chromosomes
- ▶ Caused by: **NONDISJUNCTION**
 - ▶ Failure of homologous chromosomes to separate in meiosis I
 - ▶ Failure of sister chromatids to separate in meiosis II



EXAMPLES:

▶ MONOSOMY:

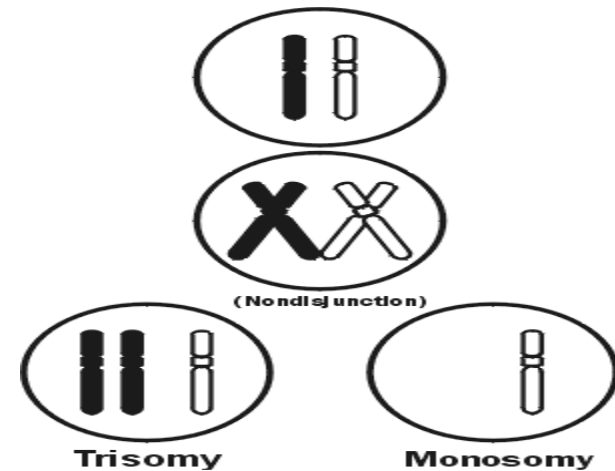
- ▶ Sex cell missing one chromosome (in place of a homologous pair)

▶ POLYSOMY:

- ▶ Condition where there are more chromosomes than required (in place of a homologous pair)

▶ POLYPLOIDY:

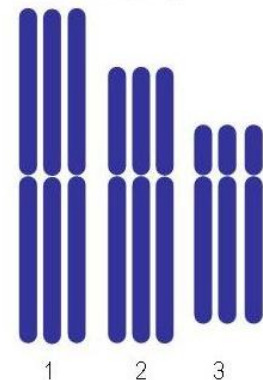
- ▶ Non-disjunction of all of the chromosomes in a gamete that unites with a haploid gamete to produce 3 sets of chromosomes ($3n$)



$2n = 6 = 2x$ (diploid)

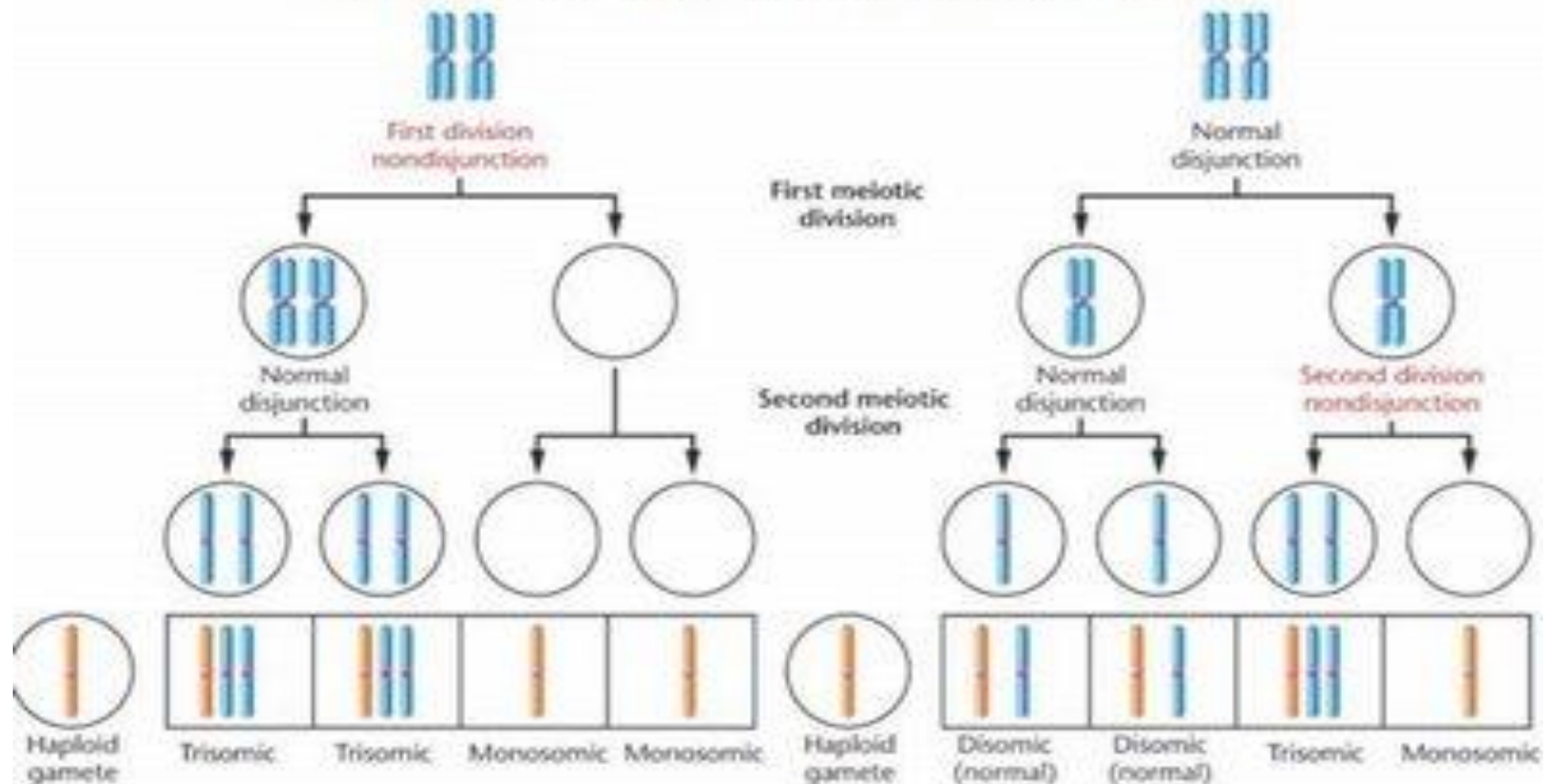


$2n = 9 = 3x$ (triploid)



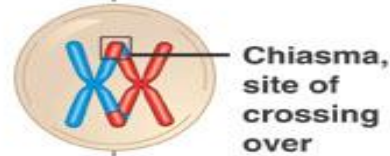
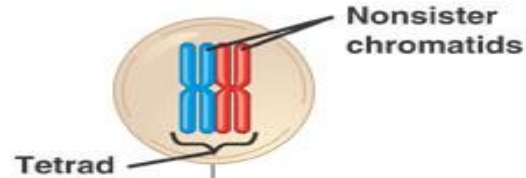
NONDISJUNCTION:

Nondisjunction results in variations in chromosome number

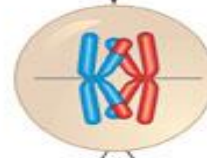


CROSSING OVER IN MEIOSIS:

Prophase I
of meiosis



Metaphase I



Metaphase II



Daughter
cells



Recombinant
chromosomes

MISTAKES IN CROSSING OVER:

- ▶ Pieces of genetic information are exchanged but do not reattach properly
- ▶ Deletion:
 - ▶ When exchanged information does not reattach to the chromosome
 - ▶ Inversion:
 - ▶ Segment of DNA reattaches to chromosome but in the reverse order
 - ▶ Duplication:
 - ▶ The exchanged information is repeated on the chromosome
 - ▶ Translocation:
 - ▶ Movement of information from one chromosome to a non-homologous chromosome

