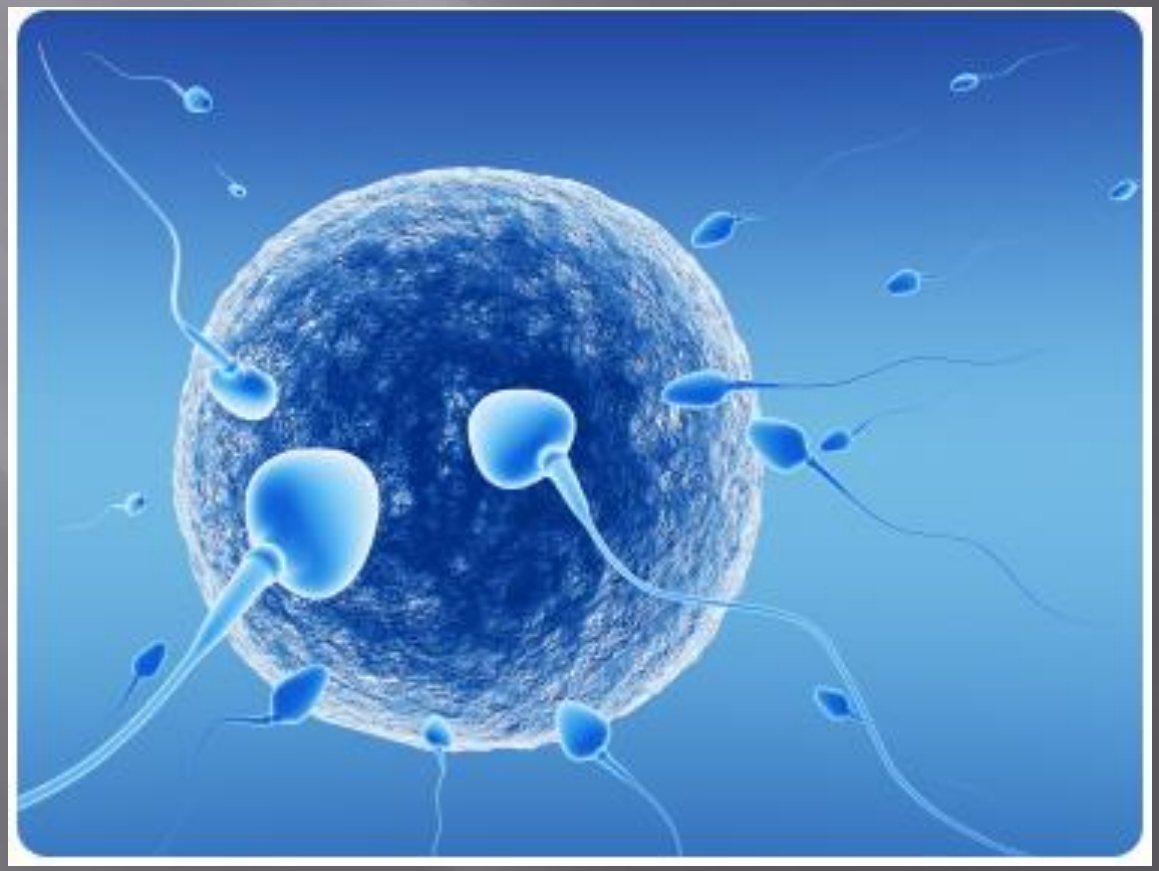
Sexual Reproduction

- The process of producing offspring by means of two parents each contributing half the genetic information to the offspring.

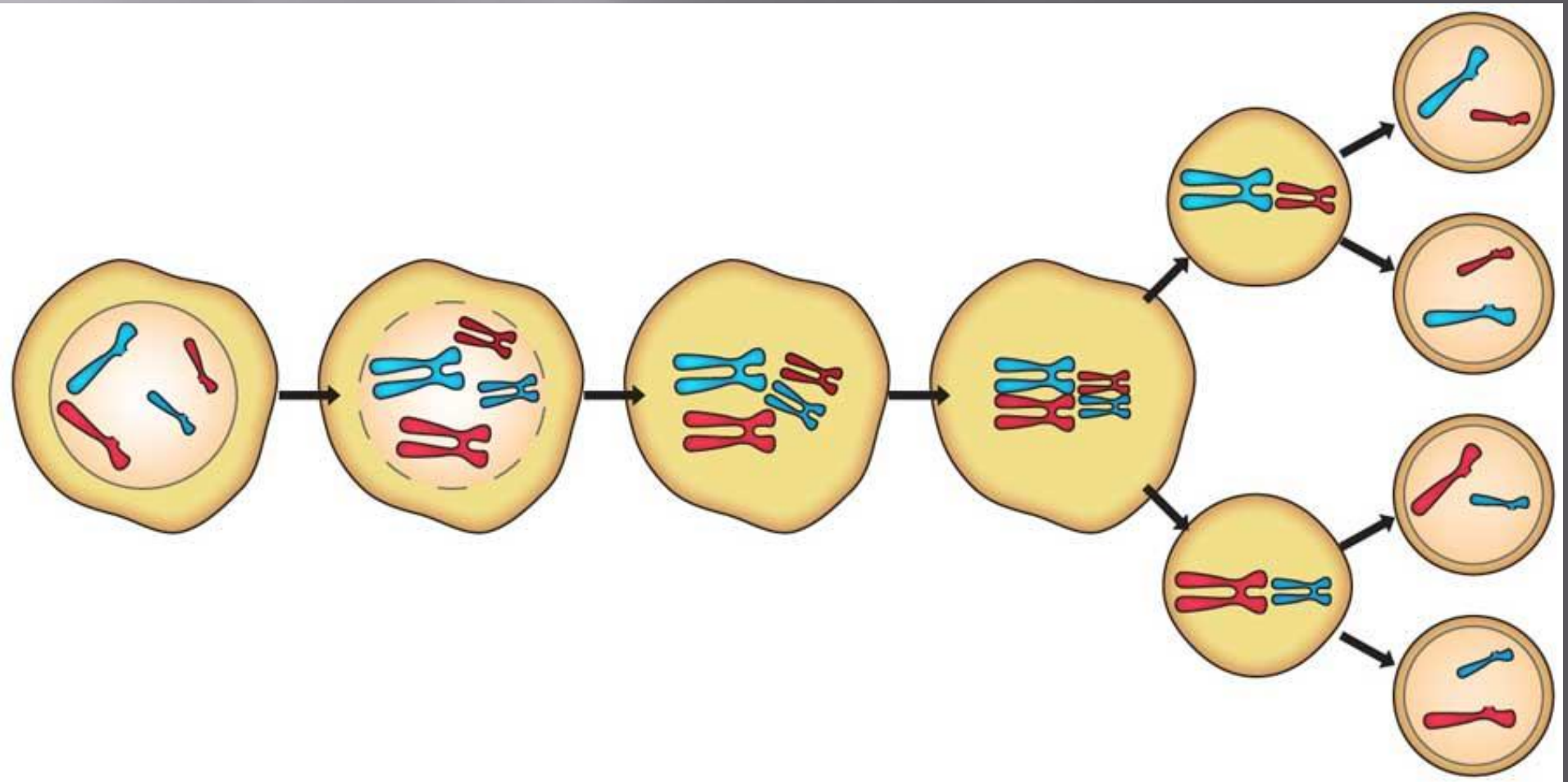


Sexual Reproduction

- Involves the union (fertilization) of two sex cells (called gametes).
- The female gamete (egg in humans) and the male gamete (sperm in humans) unite to form a zygote (a fertilized egg).

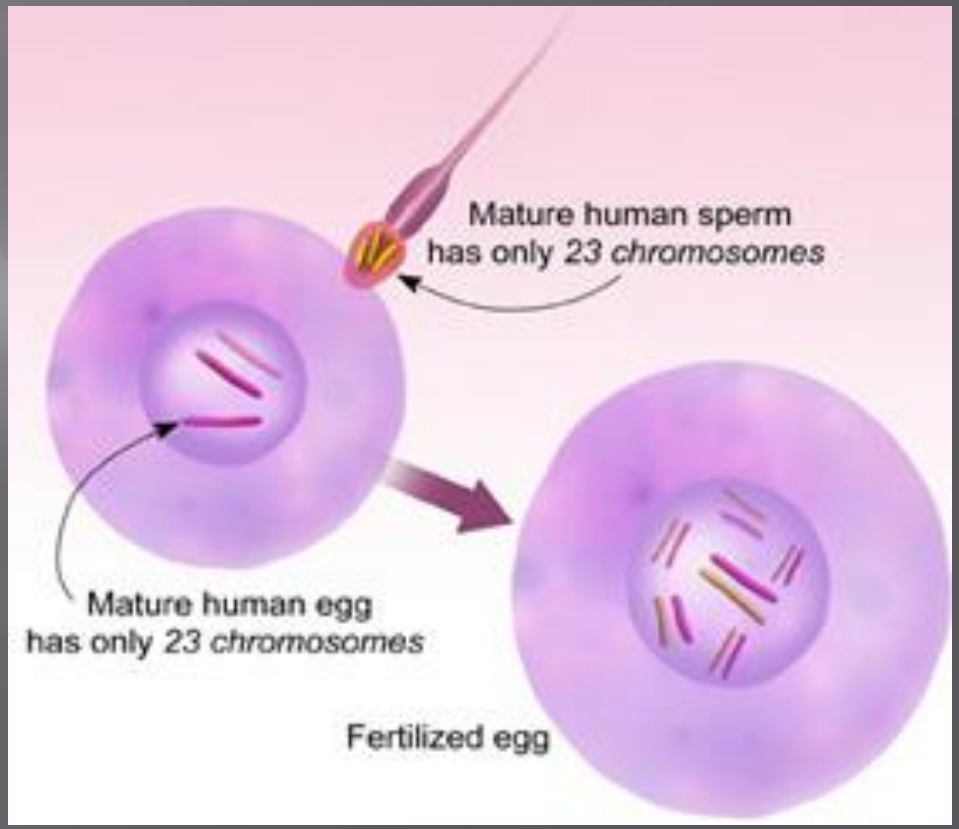
Meiosis

- A special type of cell division necessary for sexually reproducing organisms.



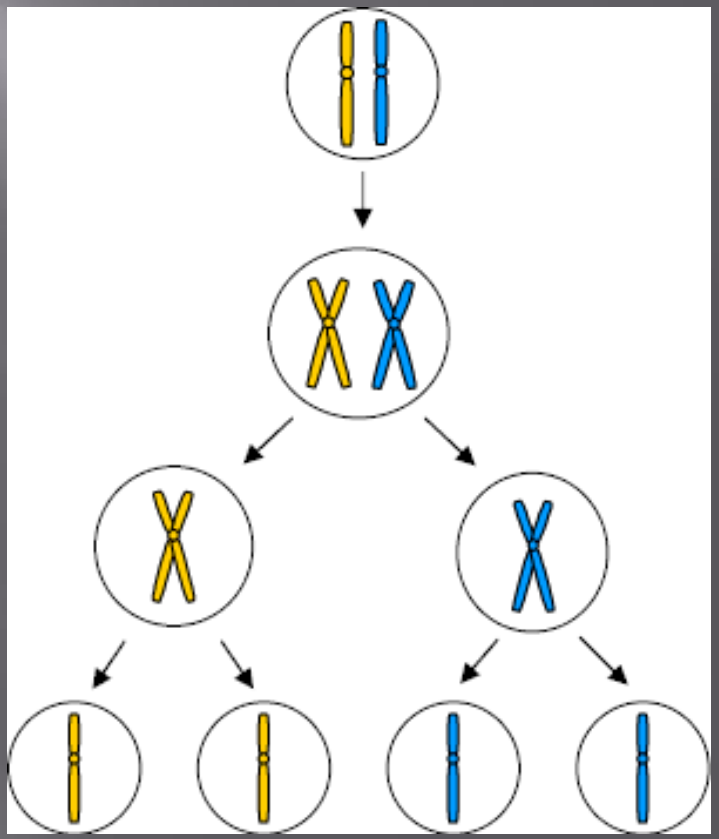
Meiosis

- Cells (gametes) produced via meiosis contain half the number of chromosomes as the parent cell and are therefore referred to as haploid cells (in humans n=23).
- Cells that have the full set of chromosomes are said to be diploid (in humans 2n=46).

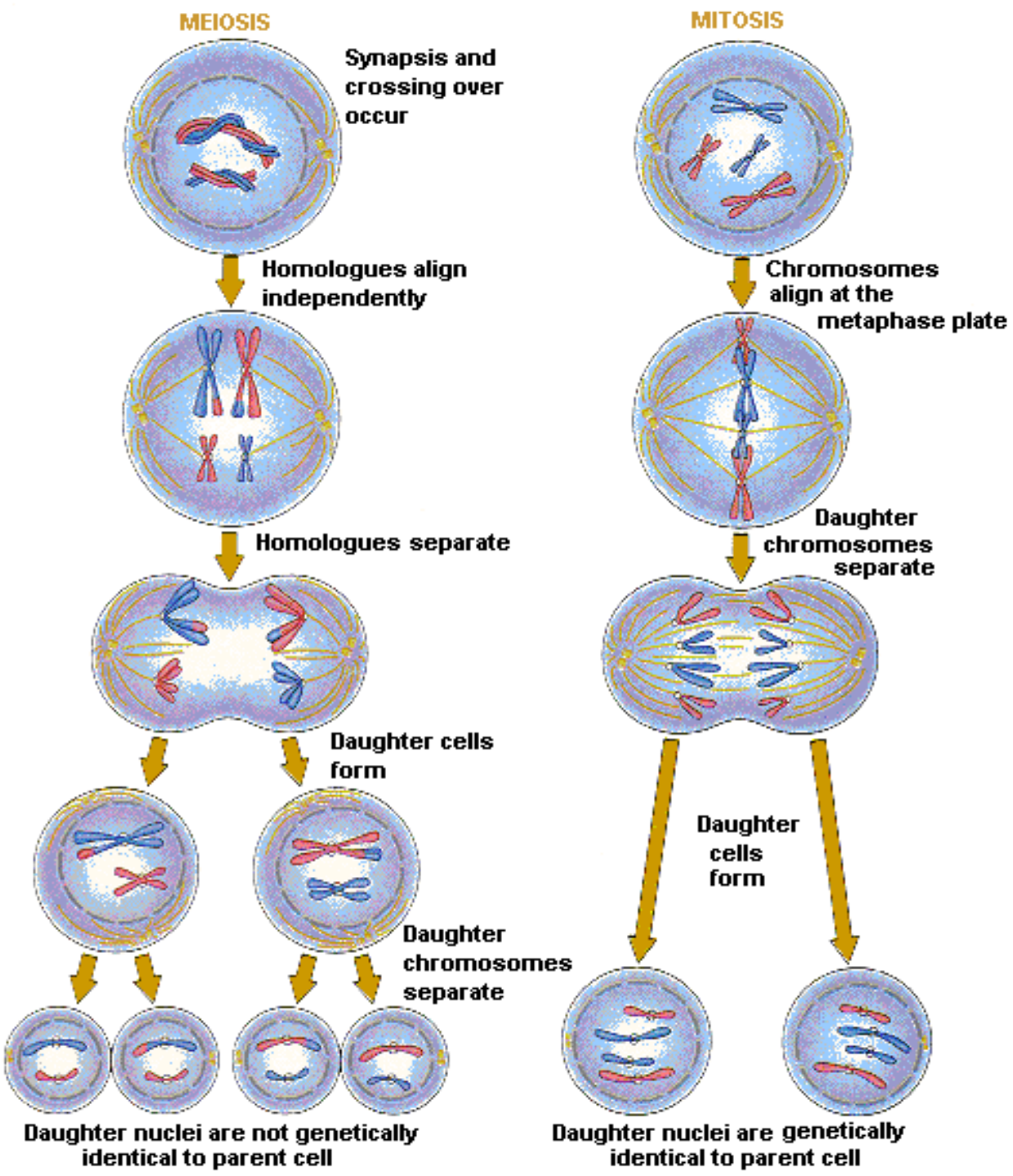


Meiosis

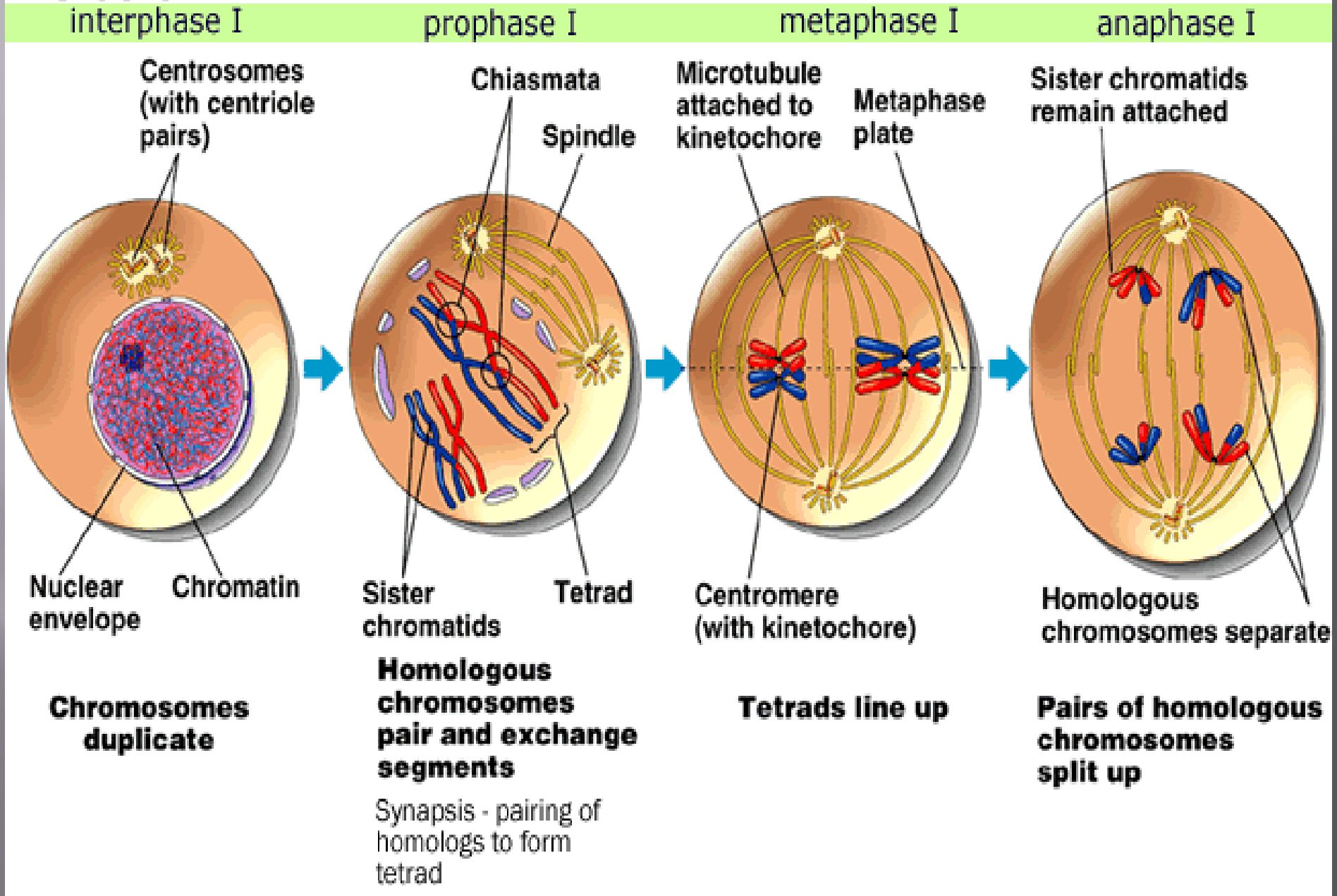
- Cells that have the full set of chromosomes are said to be diploid (in humans 2n=46).
- So we can define Meiosis as a special type of cell division which produces haploid cells called gametes.

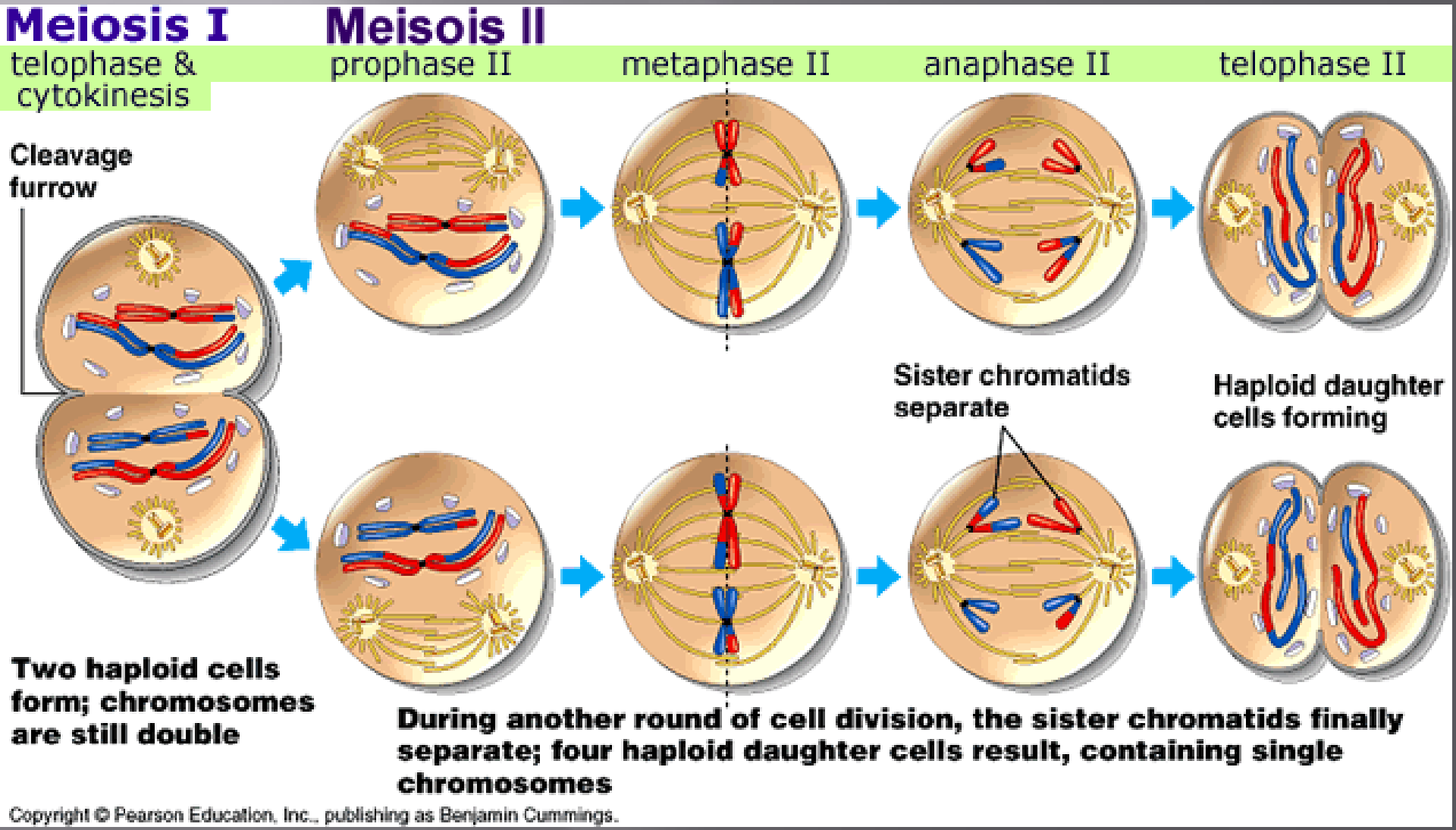


Comparing Mitosis to Meiosis



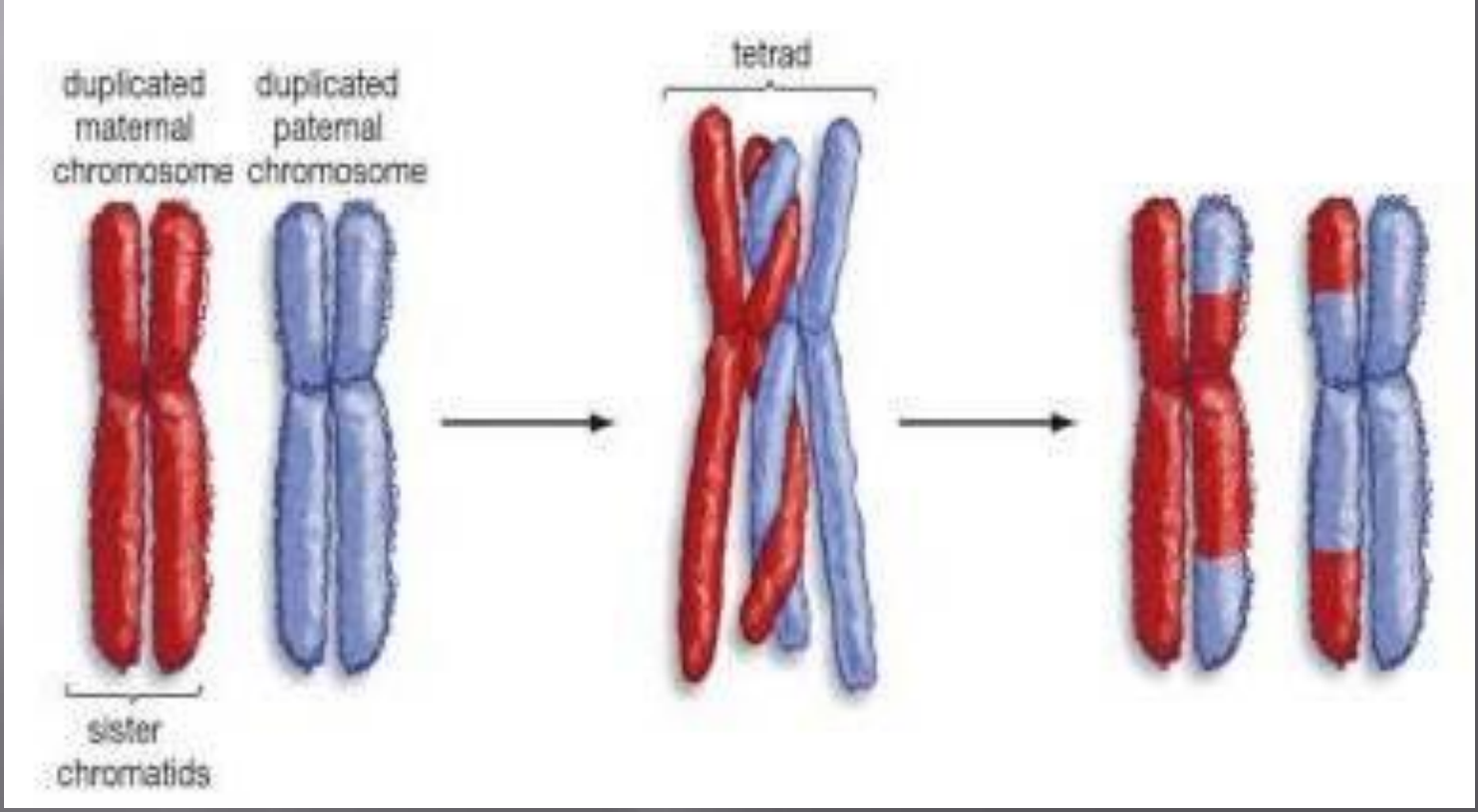
Meiosis I


interphase I
prophase I
metaphase I
anaphase I
Centrosomes (with centriole pairs)
Nuclear envelope
Chromatin
Chromosomes duplicate
Chiasmata
Spindle
Sister chromatids
Tetrad
Homologous chromosomes pair and exchange segments
Synapsis - pairing of homologs to form tetrad
Microtubule attached to kinetochore
Metaphase plate
Centromere (with kinetochore)
Tetrads line up
Sister chromatids remain attached
Homologous chromosomes separate
Pairs of homologous chromosomes split up

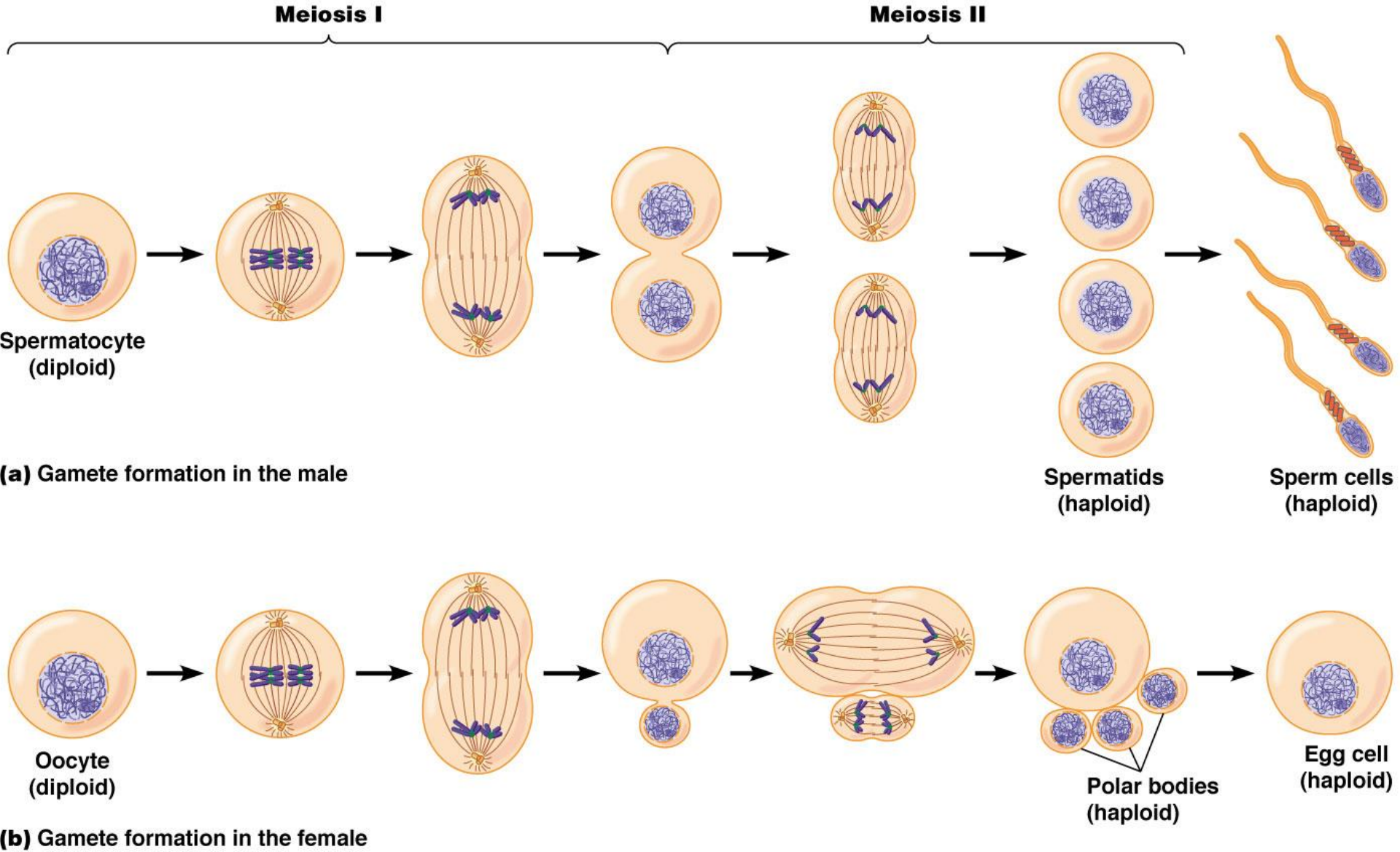


Crossing Over

- The process of homologous chromosomes exchanging sections of DNA during Prophase I of Meiosis.
- This dramatically increases the variability of the gametes produced by any given individual.



Spermatogenesis and Oogenesis



Human Genome