

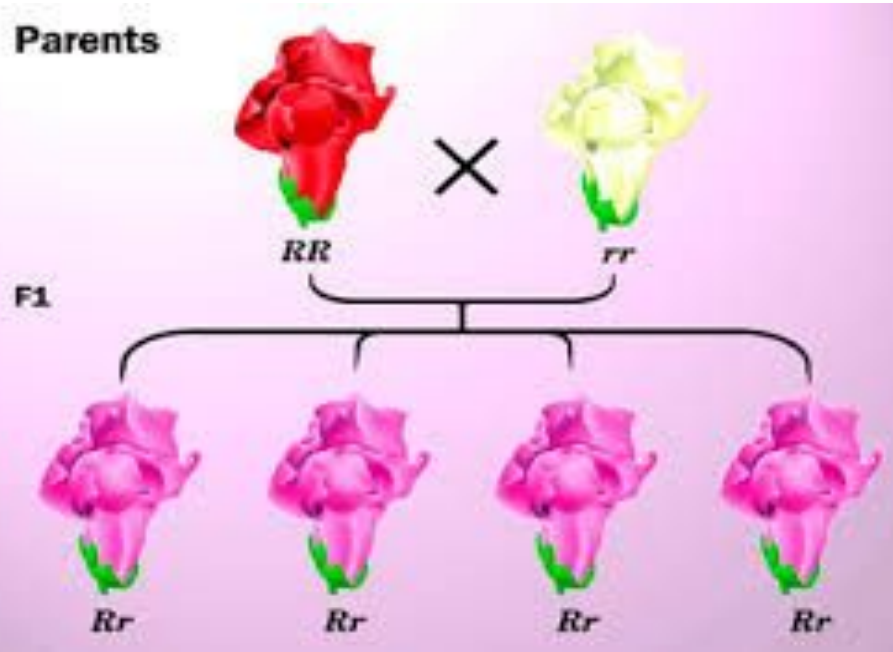
Chapter 11.3: Exploring Mendelian Genetics

LET'S REVIEW MENDEL'S PRINCIPLES:

- **The principle of inheritance**
- **The principle of dominance**
- **The principle of segregation**
- **The principle of independent assortment**

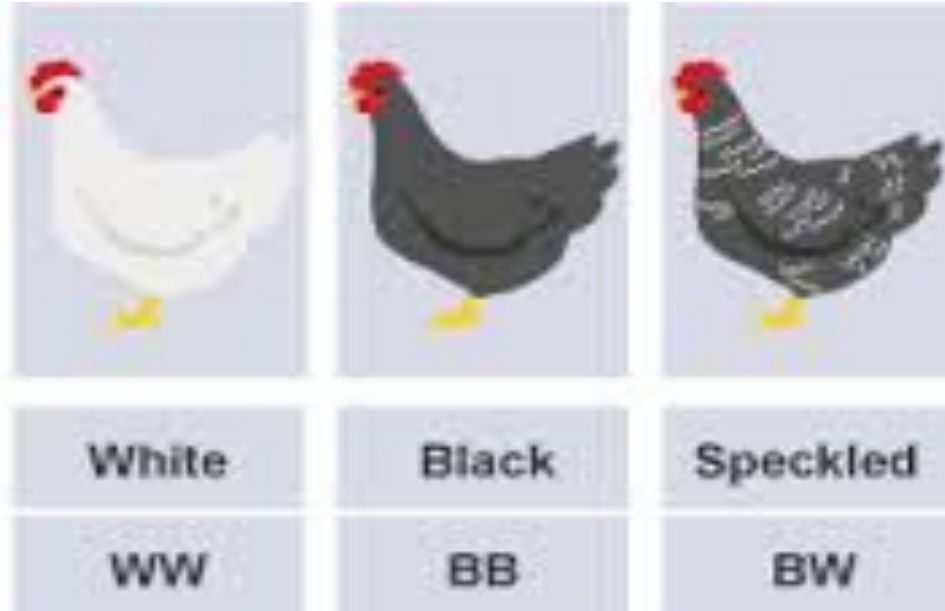
Incomplete dominance:

the heterozygous phenotype is a blended combination of the two homozygous phenotypes.







Codominance:

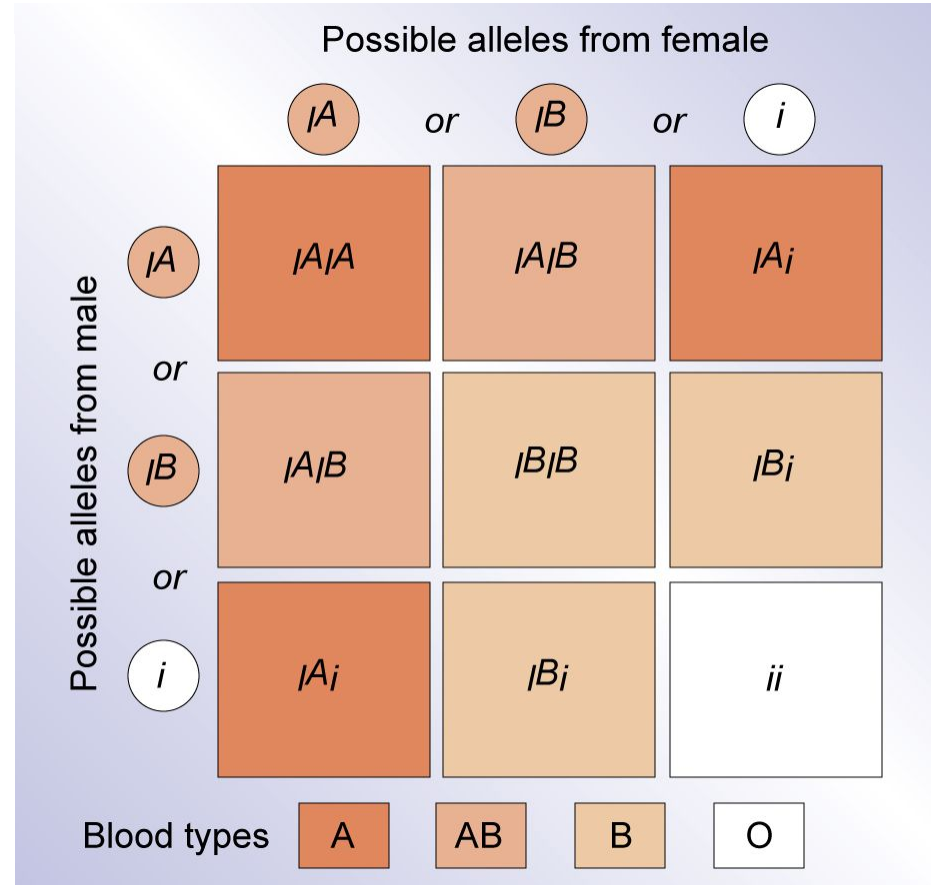
both alleles contribute to the phenotype and a mixing of the the phenotypes is observed.



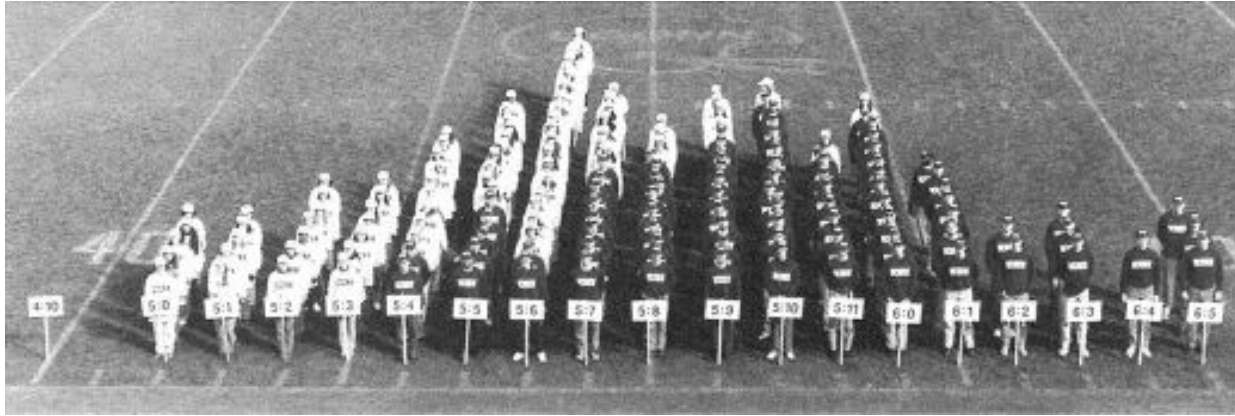
Multiple alleles: genes that have more than 2 alleles.

	<u>Genotype</u>	<u>Phenotype</u>
 Albino	cc	White hairs over the entire body
 Himalayan	$c^h c^h$	Black hairs on the extremities; white hairs everywhere else
 Chinchilla	$c^{ch} c^{ch}$	White hair with black tips on the body
 Wild-type	$c^+ c^+$	Colored hairs over the entire body

[Amoeba sisters video](#)



Polygenic traits: traits controlled by more than two genes.
poly= many genic= genes



- Height
- Skin color
- Eye color

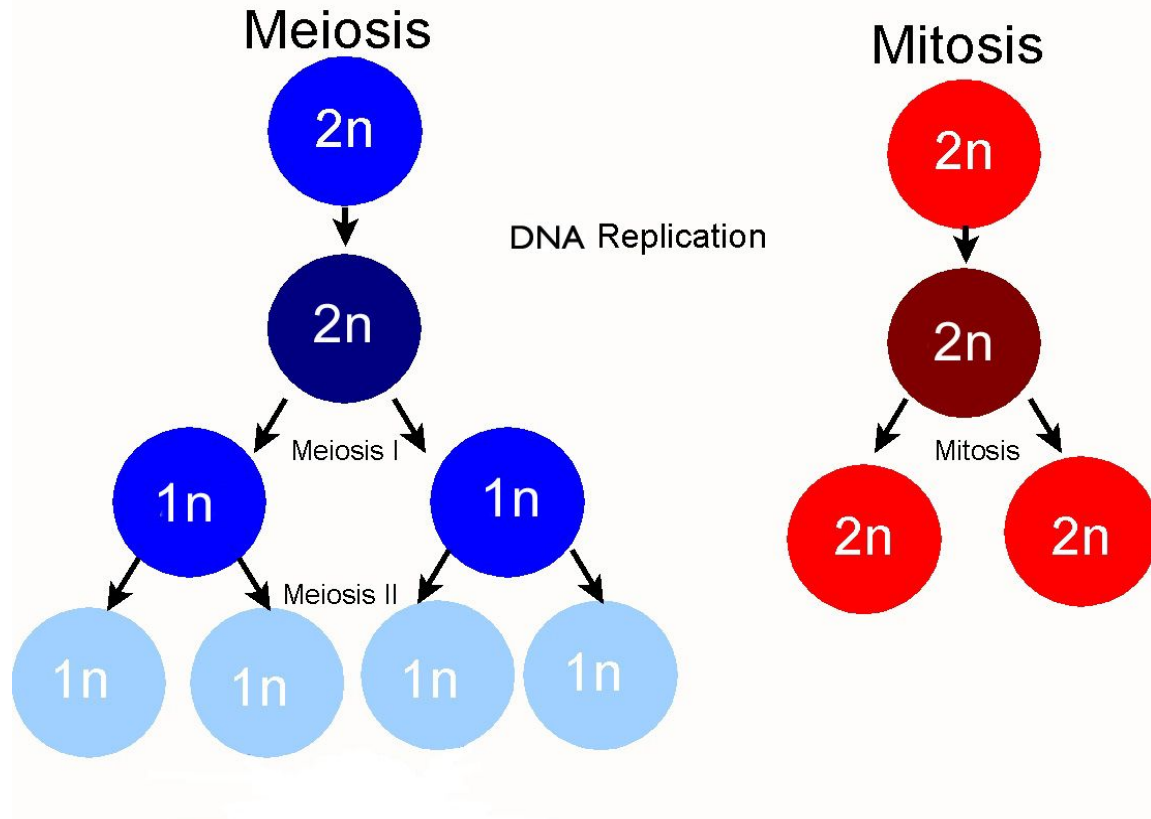
Controlled by more than 4 alleles, but all have not been identified

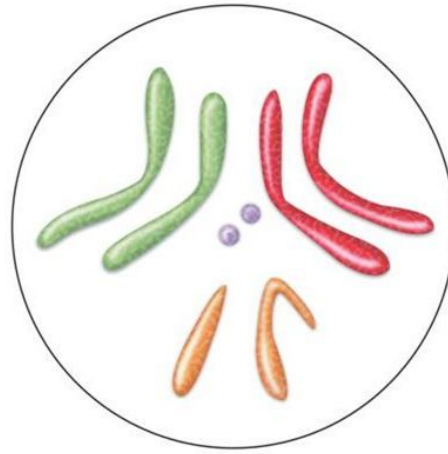


11.4 Meiosis

Sex cells do **not** undergo mitosis.

Meiosis: a type of cell division that results in 4 daughter cells with half the number of chromosomes.





Homologous chromosomes:

paired, have the same structure and position.

$$2N = 8$$

Diploid: A cell that contains a homologous set of chromosomes



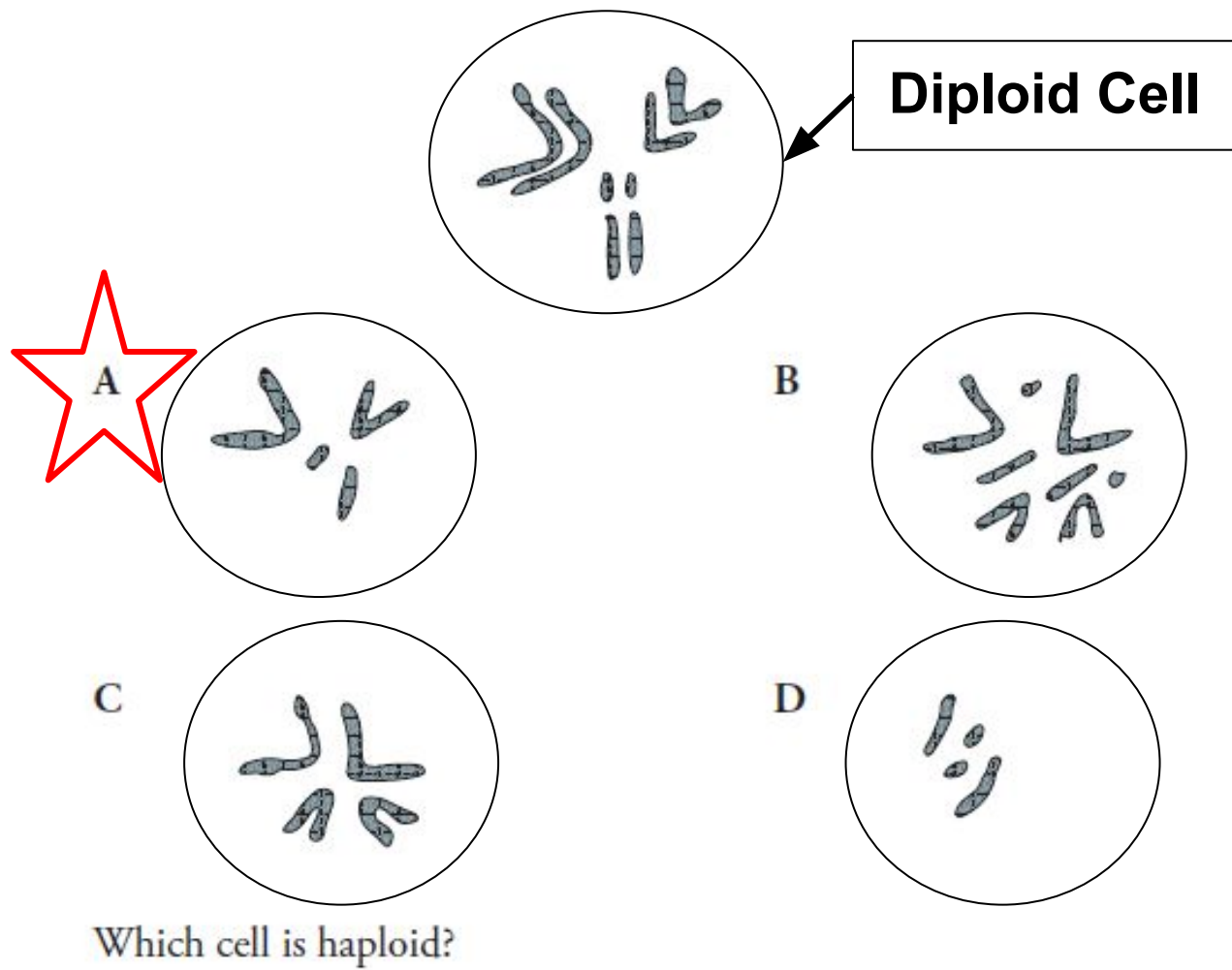
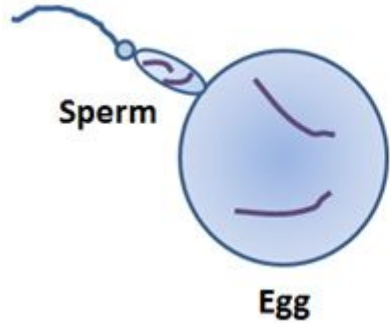
$$N = 4$$

Haploid: A gamete (sex cell) which contains only one set of chromosomes

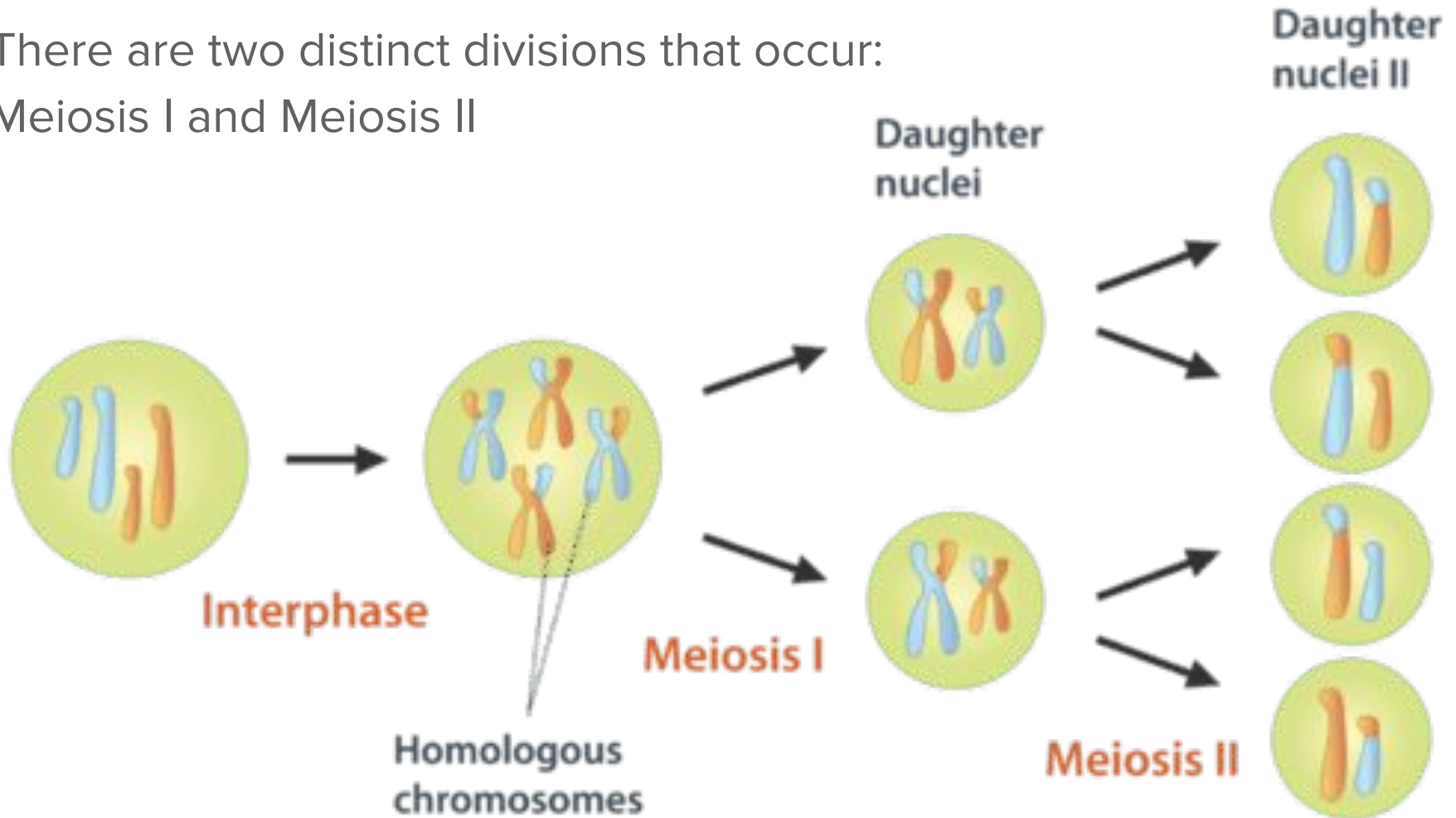
Gametes: mature male or female haploid cells

Sperm: male gamete

Egg: female gamete



There are two distinct divisions that occur:
Meiosis I and Meiosis II

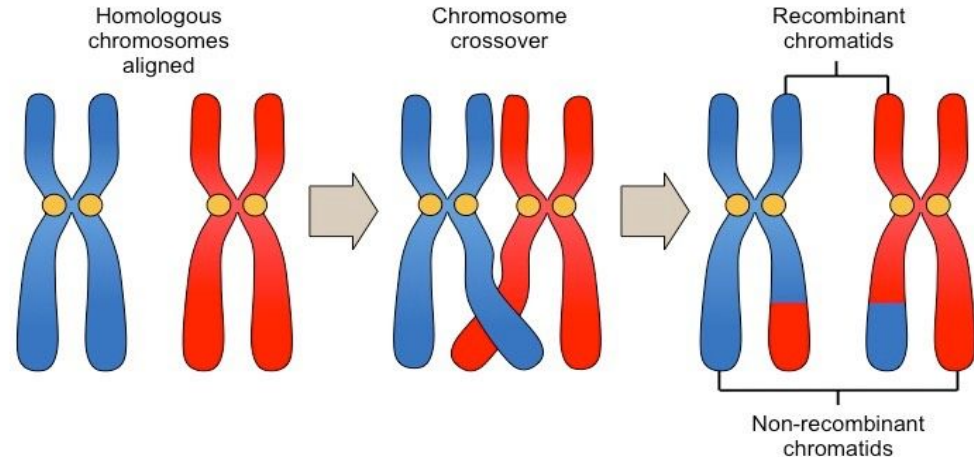
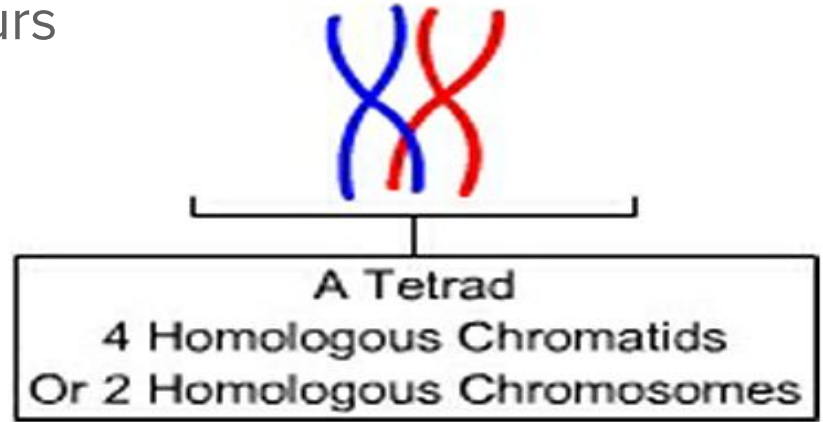


Meiosis I: the first cell division occurs

Prophase I

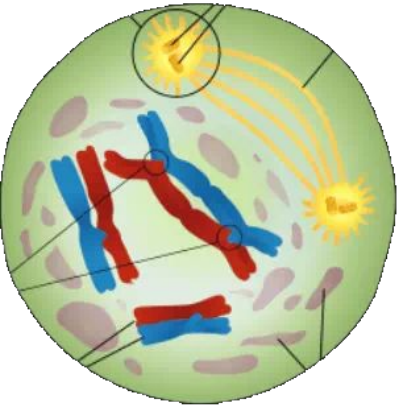
Tetrads form and crossing over occurs.

- **Tetrad:** attached pair of homologous chromosomes
- **Crossing-over:** homologous chromosomes exchange portions of their chromatids, *increases genetic variation!*

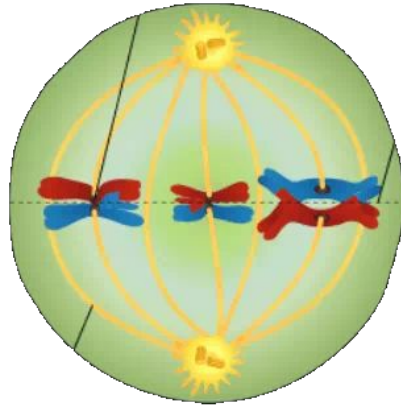


The newly recombined chromatids will continue through Meiosis I

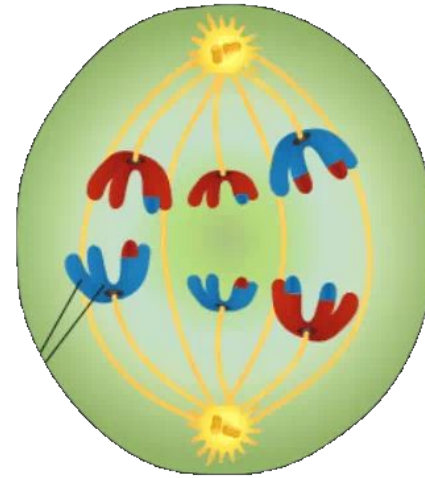
Prophase I



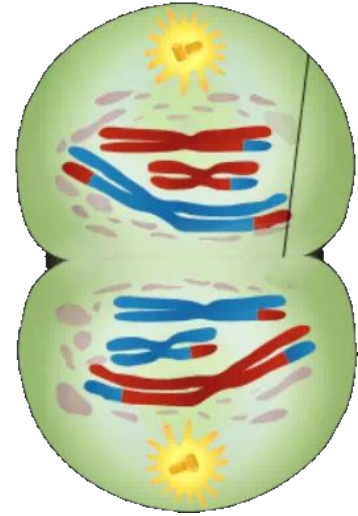
Metaphase I



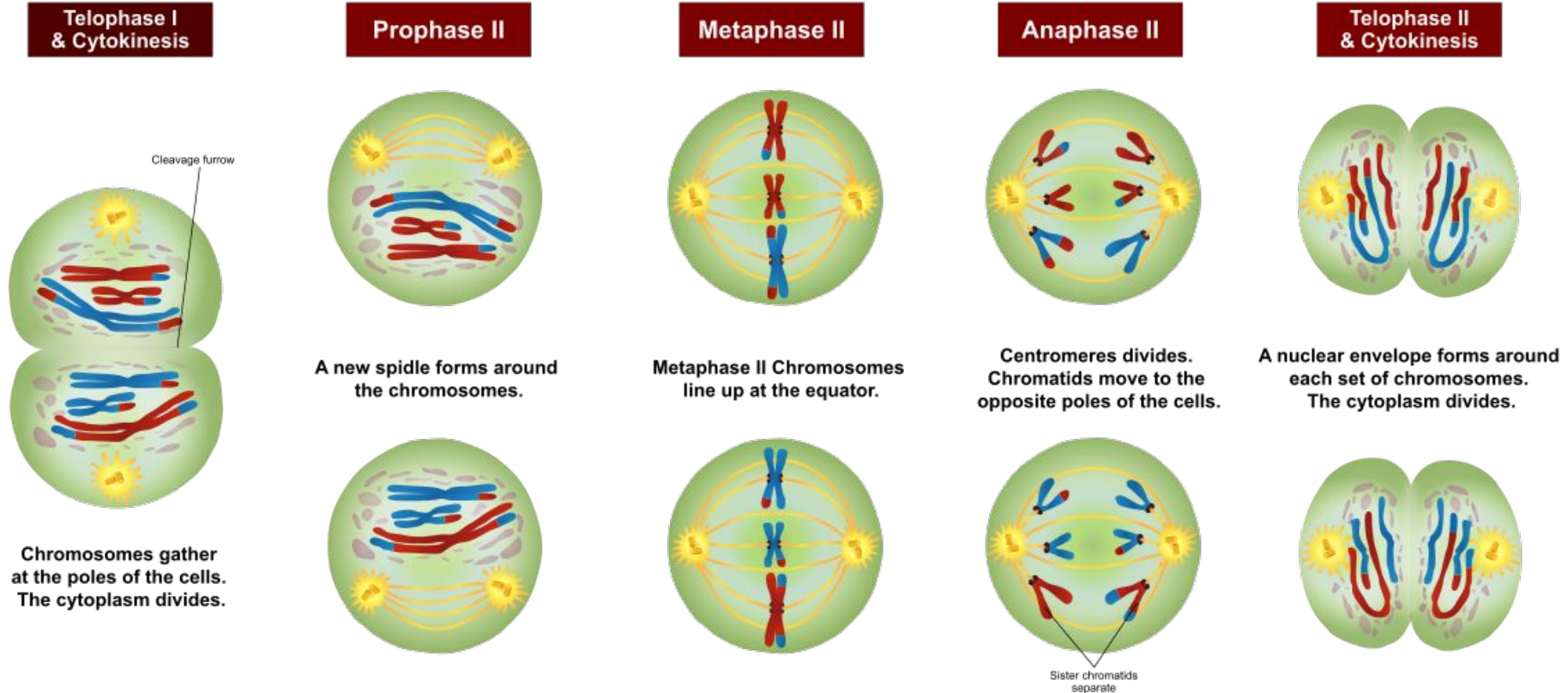
Anaphase I



**Telophase I
& cytokinesis**

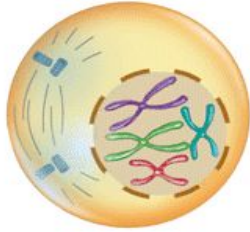


Meiosis II: Second cell division occurs (without DNA replication), ends with 4 haploid daughter cells.

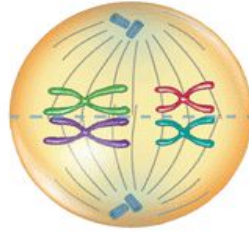


Meiosis I

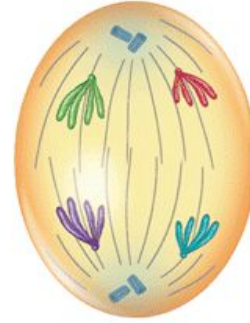
1 Prophase I



2 Metaphase I



3 Anaphase I



4 Telophase I

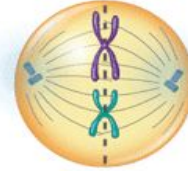
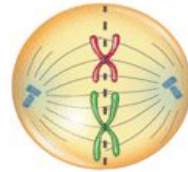


Meiosis II

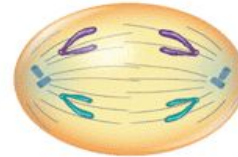
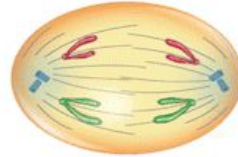
5 Prophase II



6 Metaphase II



7 Anaphase II



8 Telophase II



Let's Review!