


MEIOSIS

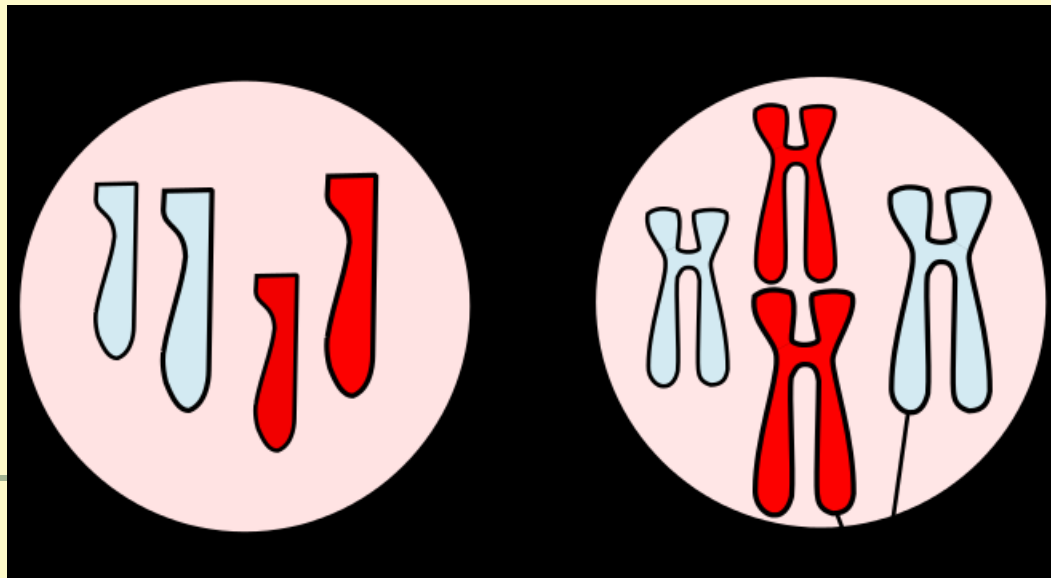
EQ: How are gametes produced?

Meiosis

- the process by which "gametes" (sex cells) , with half the number of chromosomes, are produced.
 - Meiosis occurs with two cell divisions
 - called meiosis I and meiosis II
 - Chromosomes only duplicate once
-
- 

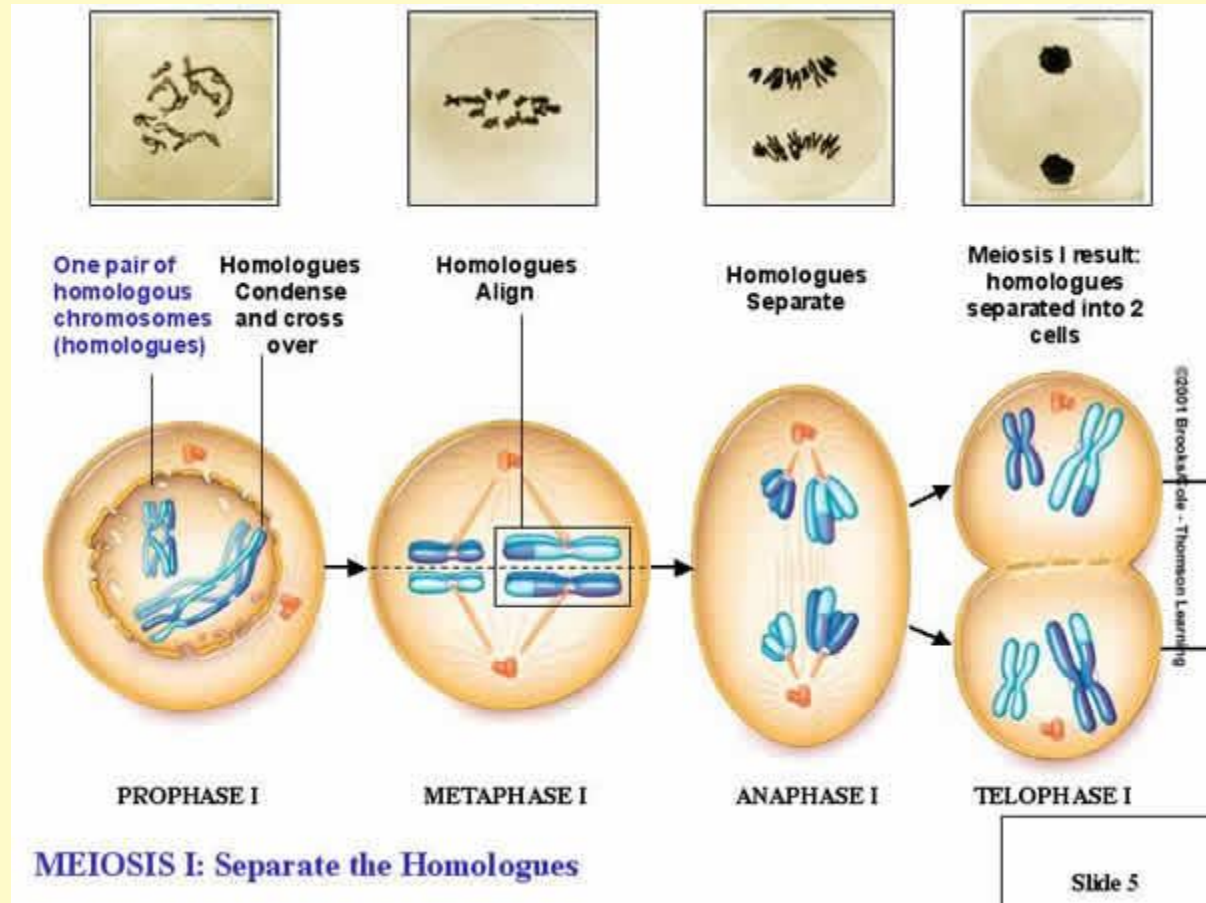
Interphase I

- Similar to mitosis interphase.
- Chromosomes replicate.
- Each duplicated chromosome consist of two identical sister chromatids attached at their centromeres (the middle)




Meiosis I (four phases)

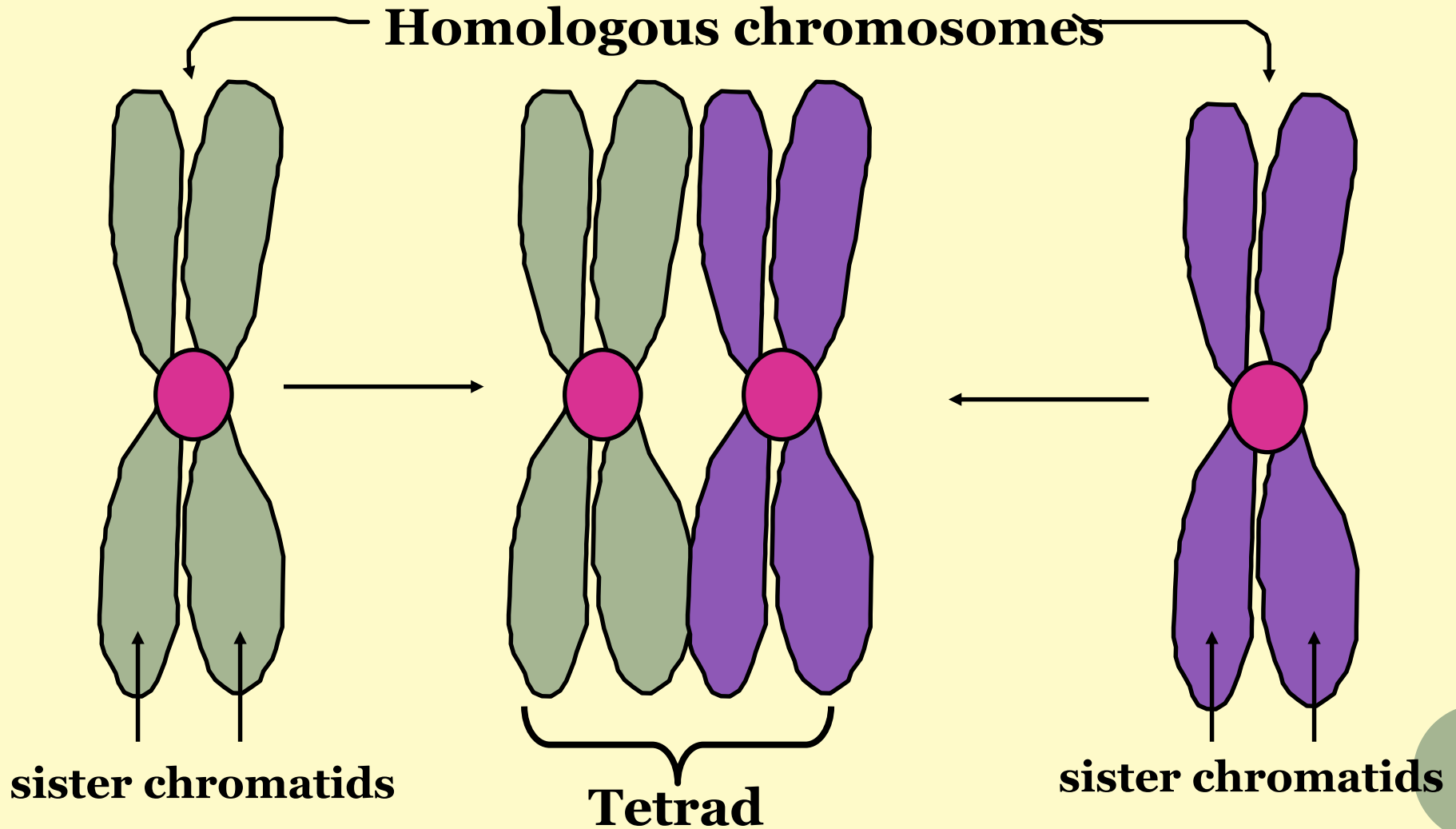
- a. prophase I
- b. metaphase I
- c. anaphase I
- d. telophase I



Prophase I

- Synapsis occurs: homologous chromosomes come together to form a tetrad.
 - Tetrad is two chromosomes or four chromatids (sister and nonsister chromatids).
-
- 

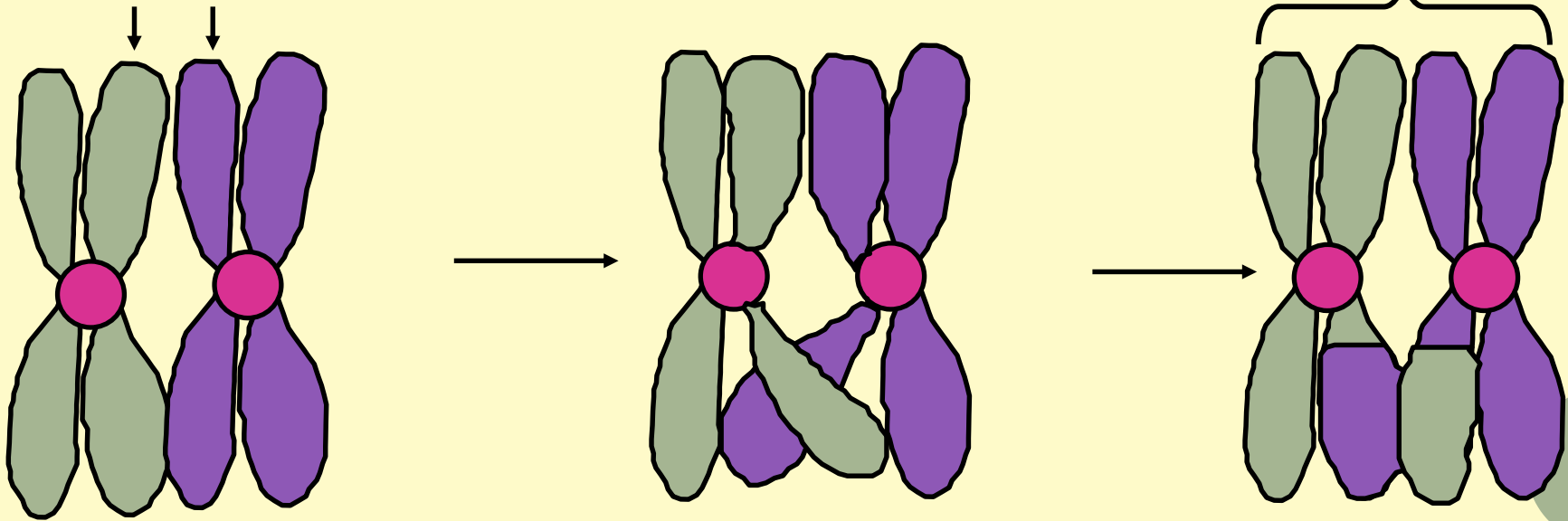
Prophase I - Synapsis



During Prophase I “Crossing Over” occurs.

- During Crossing over, segments of nonsister chromatids break and reattach to the other chromatid.
- This creates genetic variation within the gametes

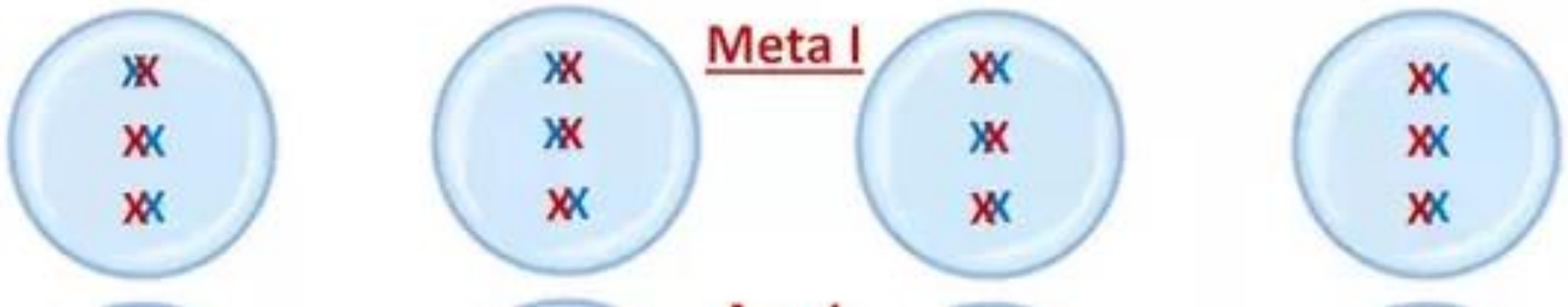
nonsister chromatids



Metaphase I

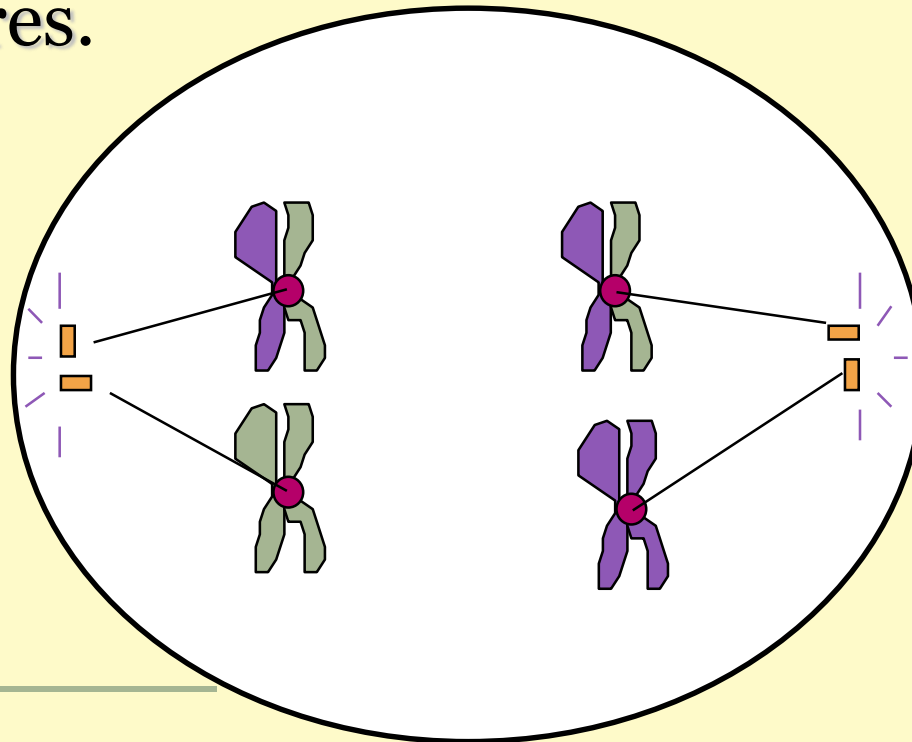
- Tetrads align on the metaphase plate.
- **INDEPENDENT ASSORTMENT OCCURS:**
 - homologous pairs line up randomly.
 - Another source of variation in the gametes

leads to different combinations of chromosomes in gametes



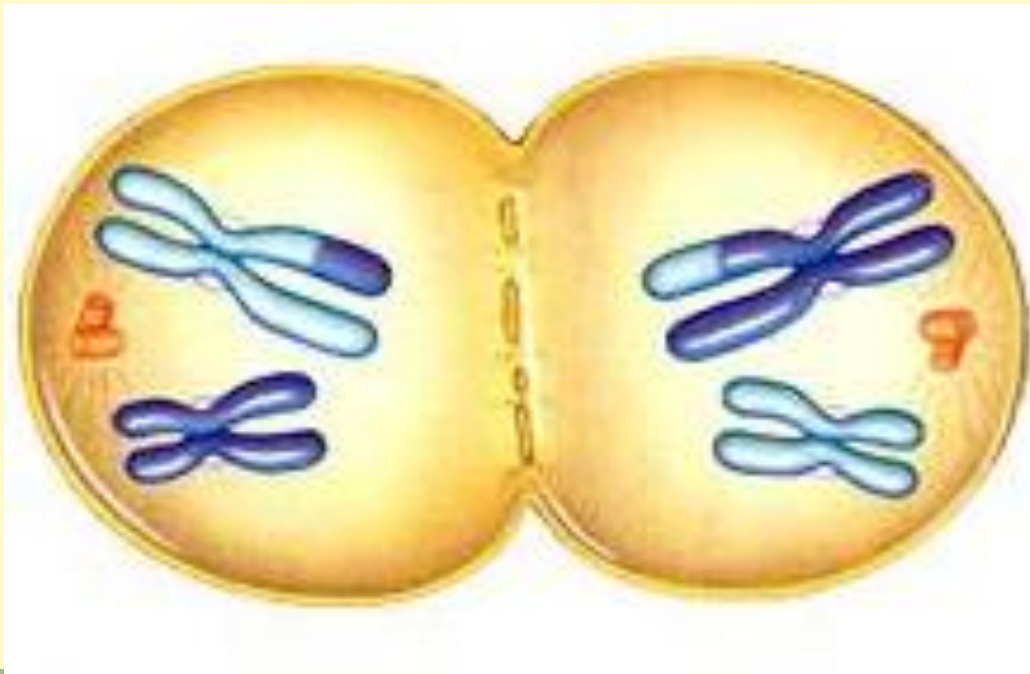
Anaphase I

- Homologous chromosomes separate and move towards the poles.
- Sister chromatids remain attached at their centromeres.




Telophase I

- Each pole now has haploid set of chromosomes.
- Cytokinesis occurs and two haploid daughter cells are formed.

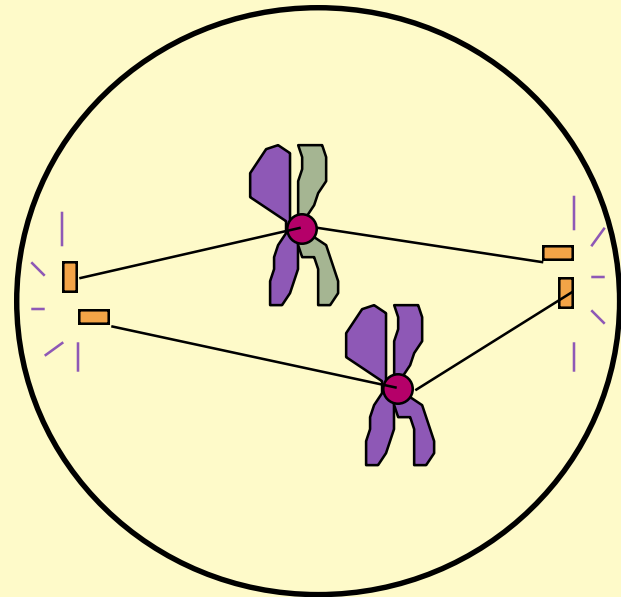
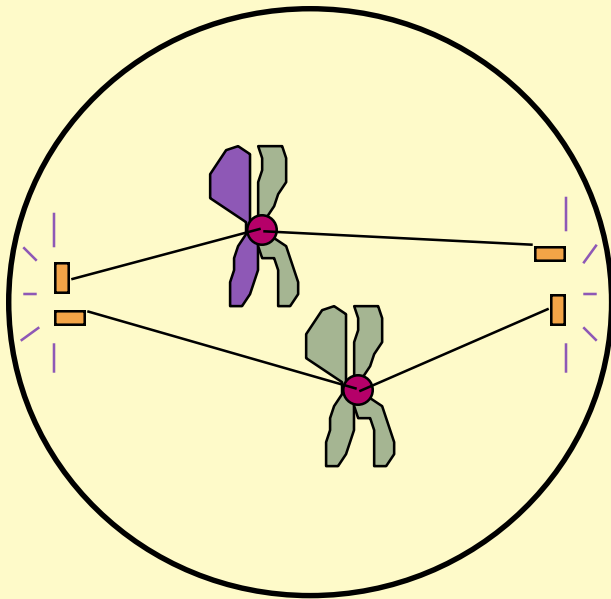


Meiosis II

- No interphase II
 - no more DNA replication
 - Remember: Meiosis II is similar to mitosis
-
- 

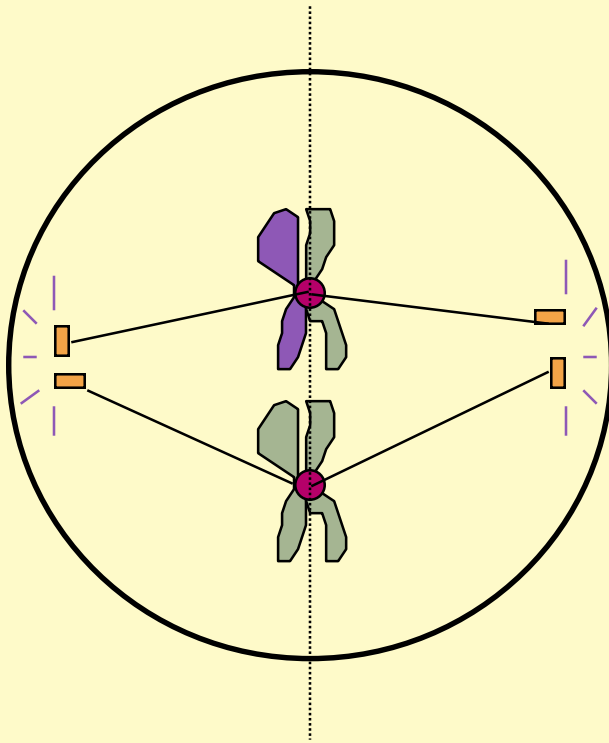
Prophase II

- Sister chromatids attach at the centromere

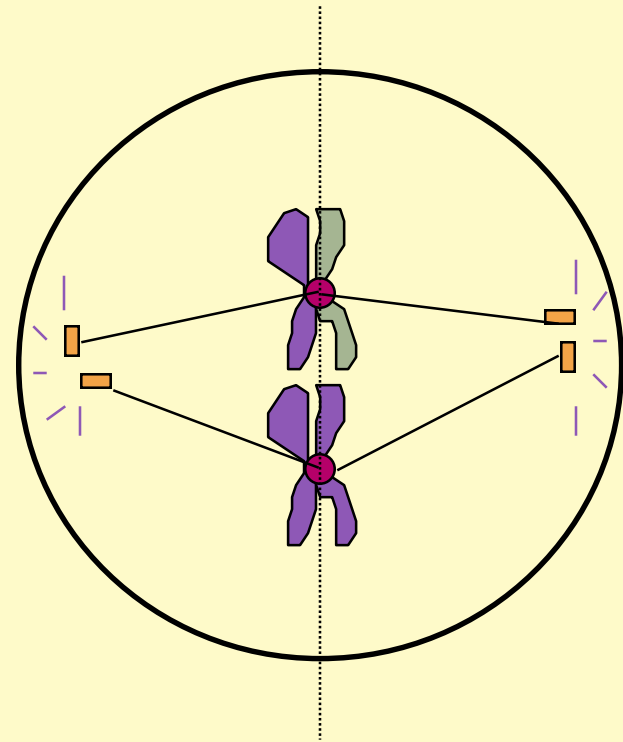


Metaphase II

- Sister chromatids line up at the metaphase plate



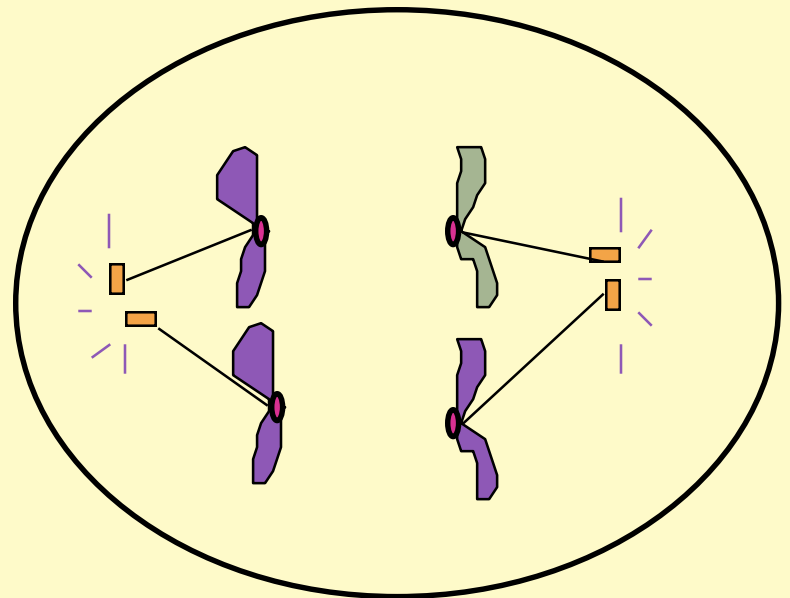
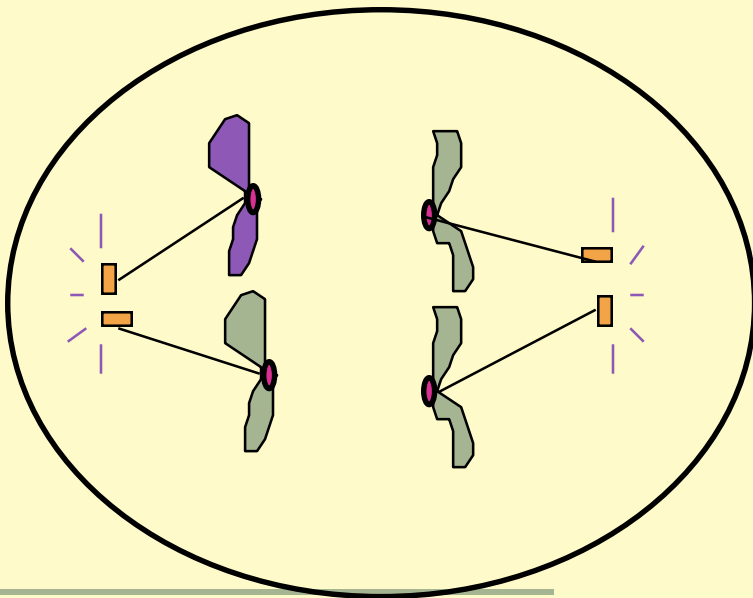
metaphase plate



metaphase plate

Anaphase II

- sister chromatids separate and move toward poles



Telophase II

- New Nuclei form.
- Cytokinesis occurs.
- Four haploid daughter cells are produced.
 - These are gametes = sperm or egg

