MEIOSIS

SBI 3C

Meiosis:

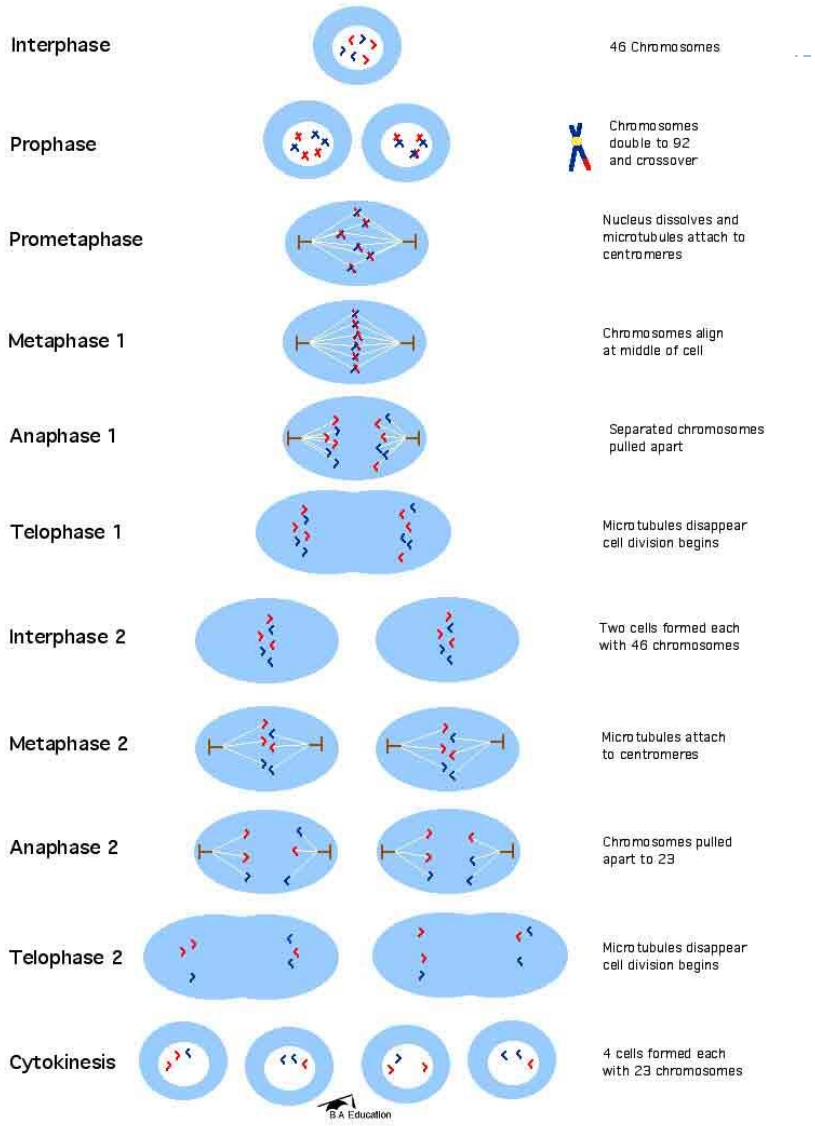
- Involves 2 parents (sexual reproduction)
- Hereditary material is exchanged (mixed and transferred)
- Involves 2 cell divisions with no replication of DNA in between
- Each species has a **specific number of chromosomes**
- For example **humans**
  - total number of chromosomes is 46
  - diploid number is 46
  - 2n = 46
  - the number of chromosomes in the gametes is the haploid number or n = 23
- Other examples
  - crayfish 2n = 126 fruit flies 2n = 4

Meiosis animation:

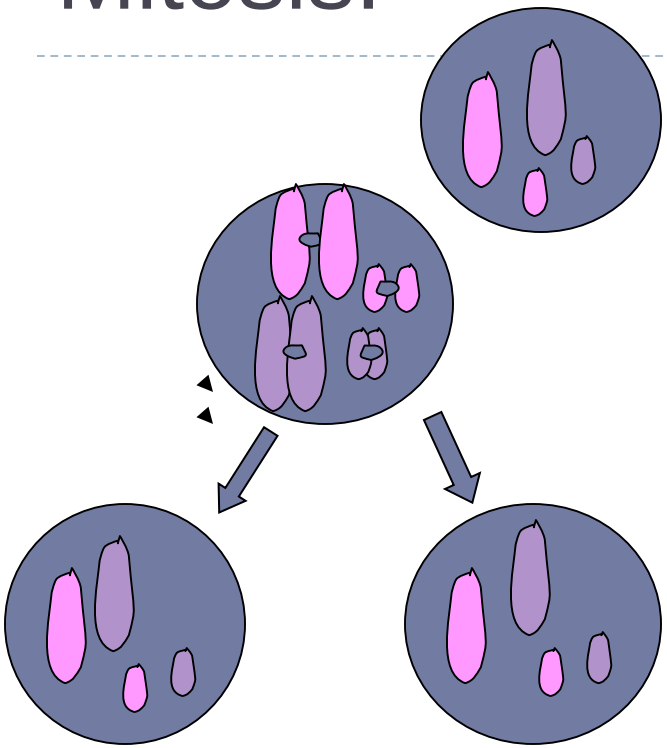
http://www.youtube.com/watch?v=D1_-mQS_FZ0&NR=1

Phases of Meiosis:

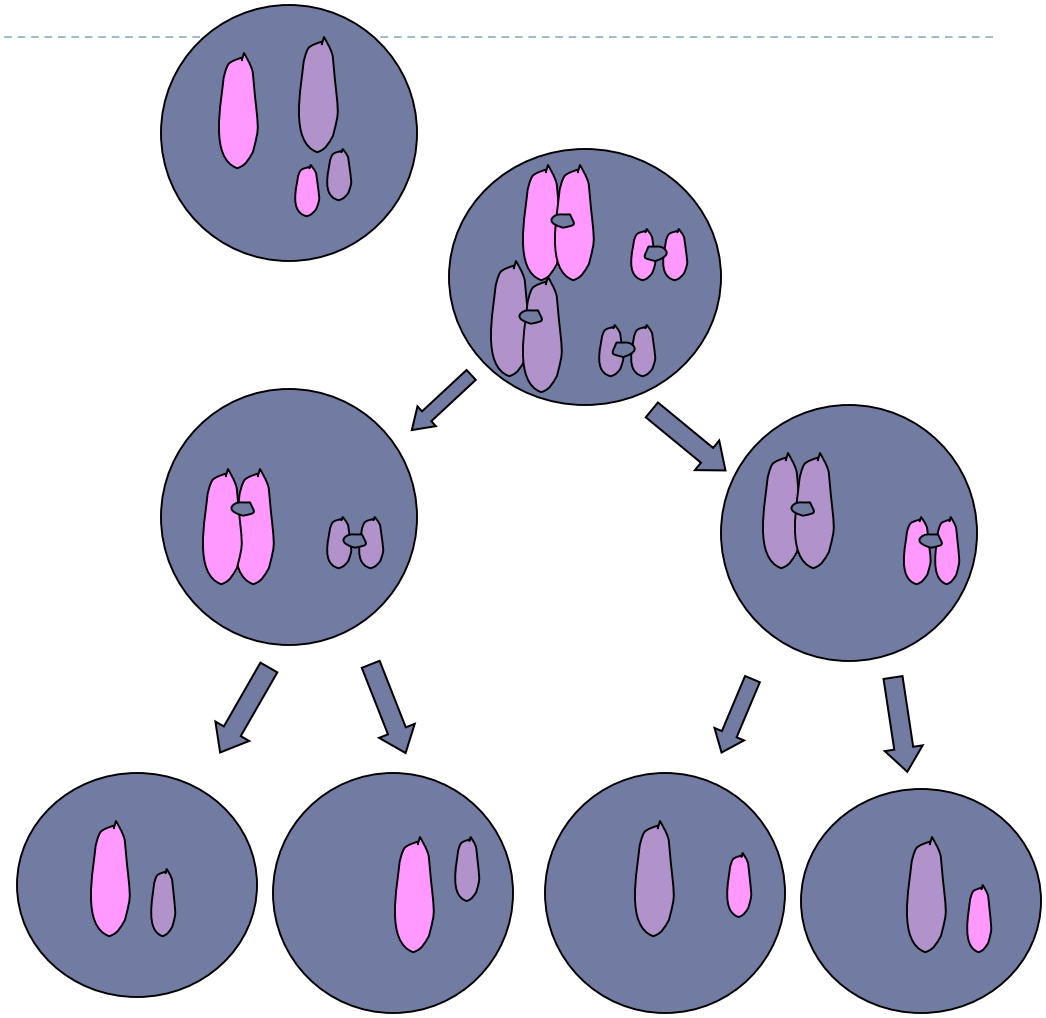
- Interphase
- Prophase I and II
- Metaphase I and II
- Anaphase I and II
- Telophase I and II



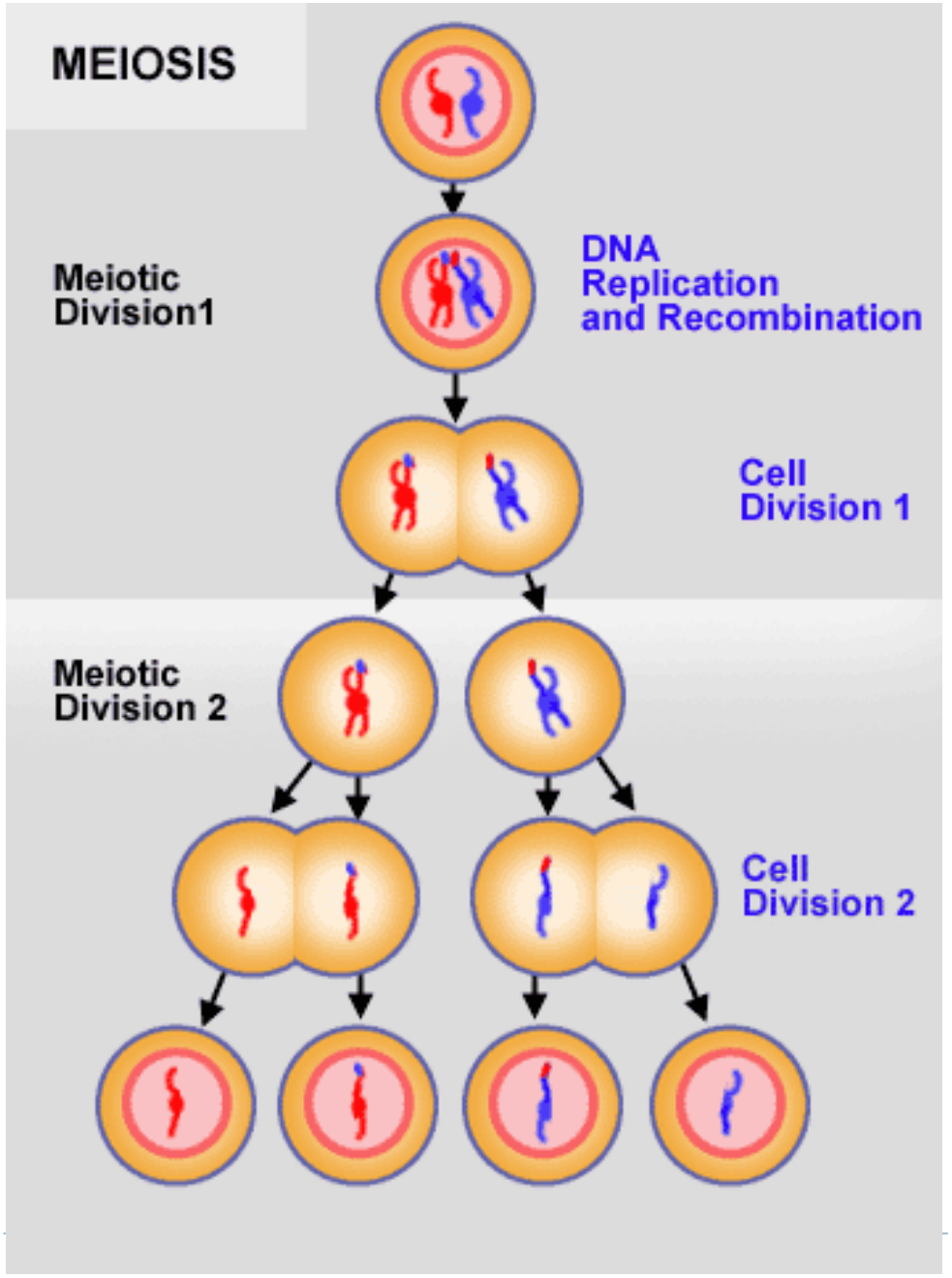
Mitosis:



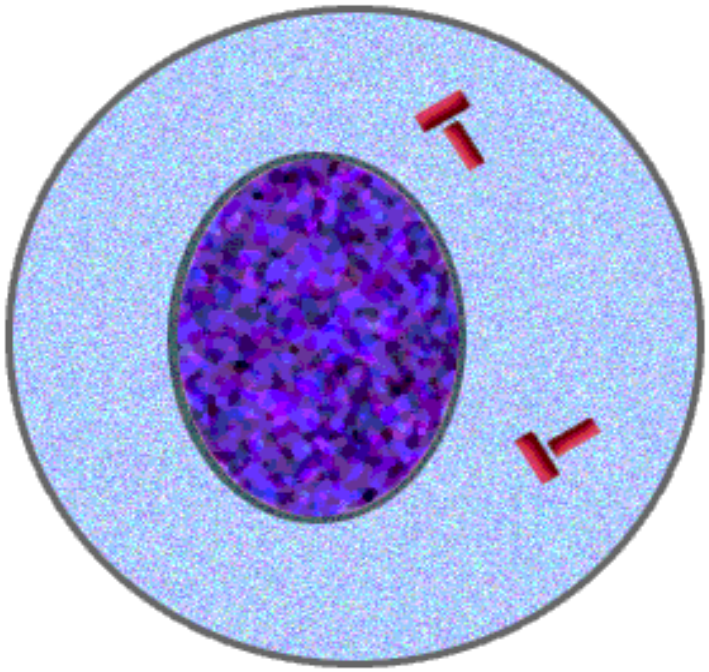
Meiosis:



Each resulting cell still has chromosomes from mom & dad


MEIOSIS
Meiotic Division1
DNA Replication and Recombination
Cell Division 1
Meiotic Division 2
Cell Division 2

Meiosis Interphase



Meiosis is preceded by interphase. The chromosomes have not yet condensed.

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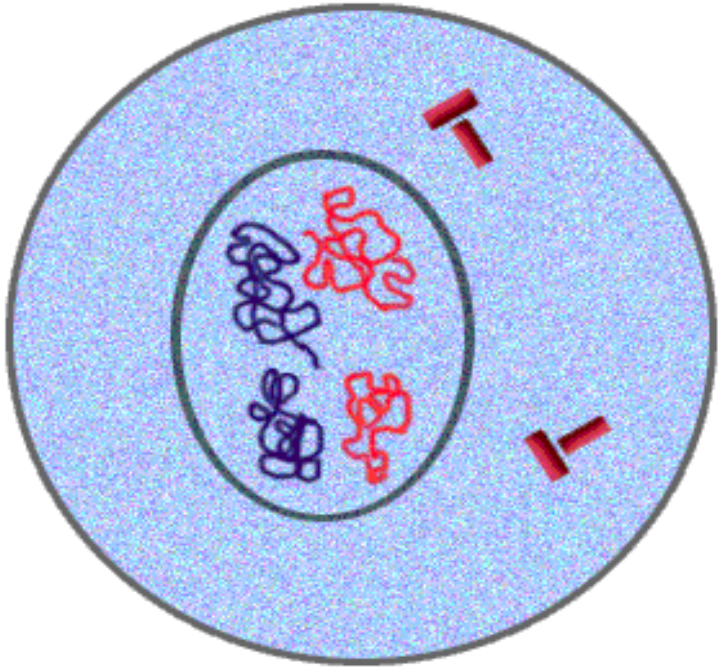
Meiosis Interphase



The chromosomes have replicated, and the chromatin begins to condense.

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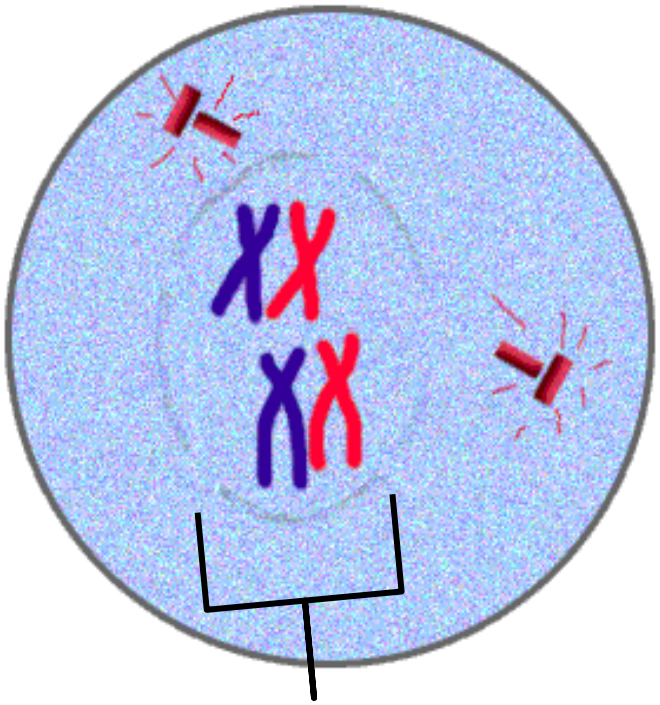
Meiosis Prophase I



- the chromatin shortens to form chromosomes
- homologous chromosomes pair up to form tetrads

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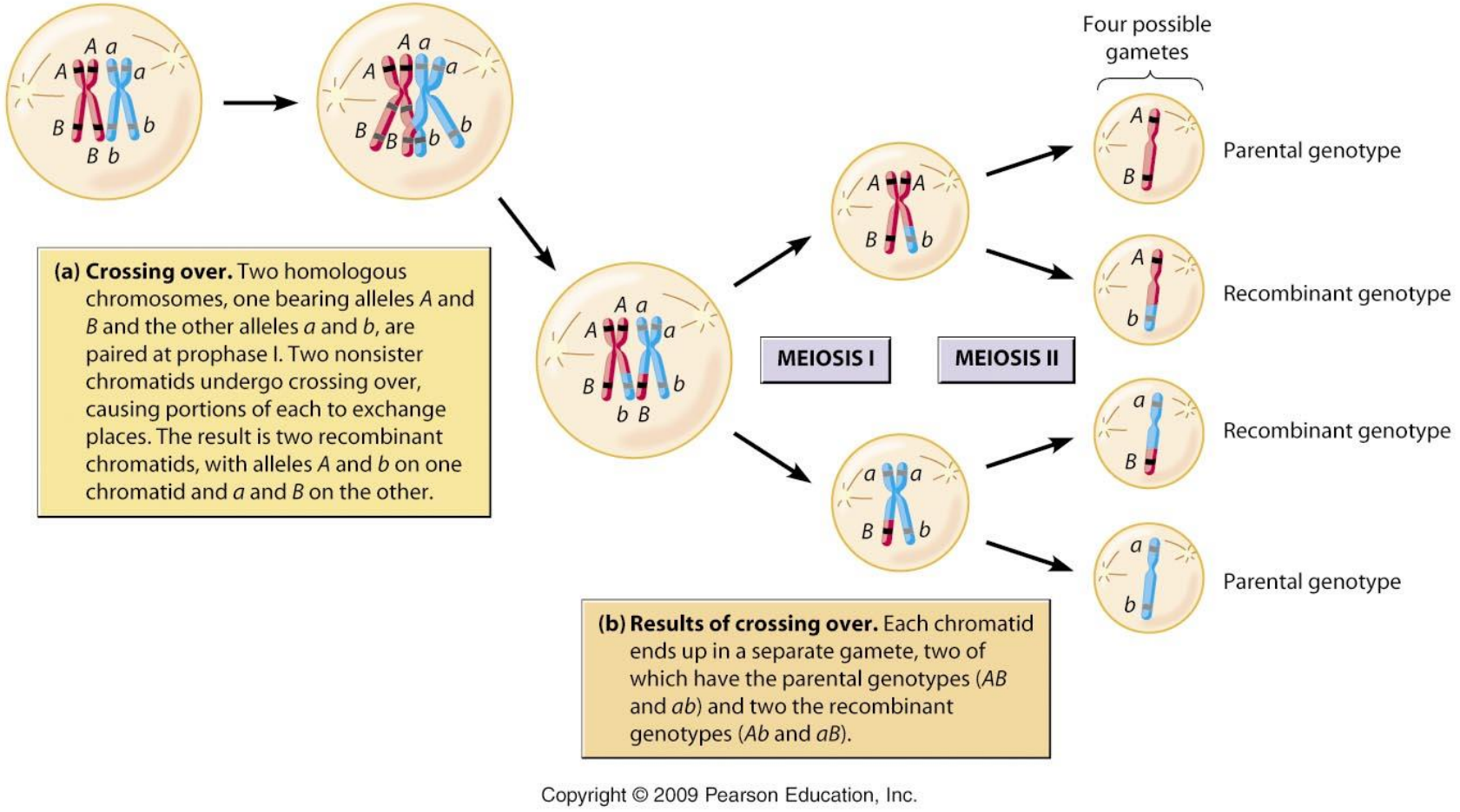
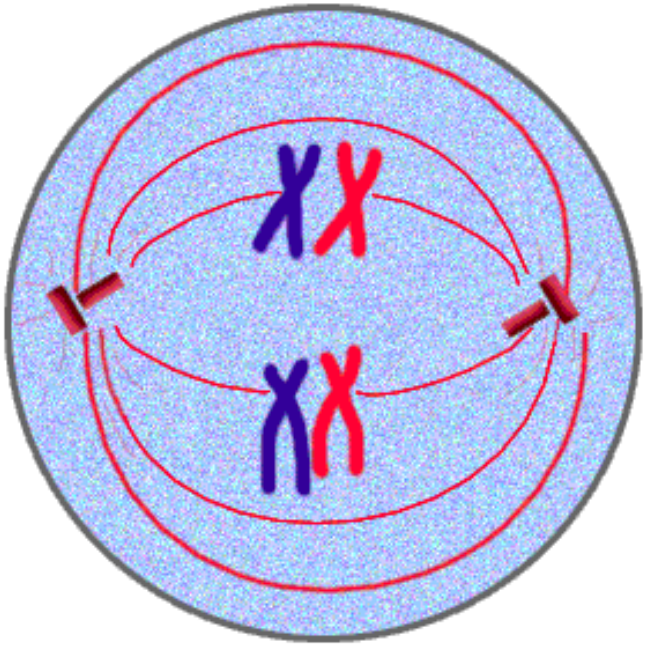
Crossing Over in Prophase I of Meiosis



Meiosis Metaphase I



- chromosomes line up across the middle or equator of the cell
- centromeres of chromosomes attach to spindle fibres

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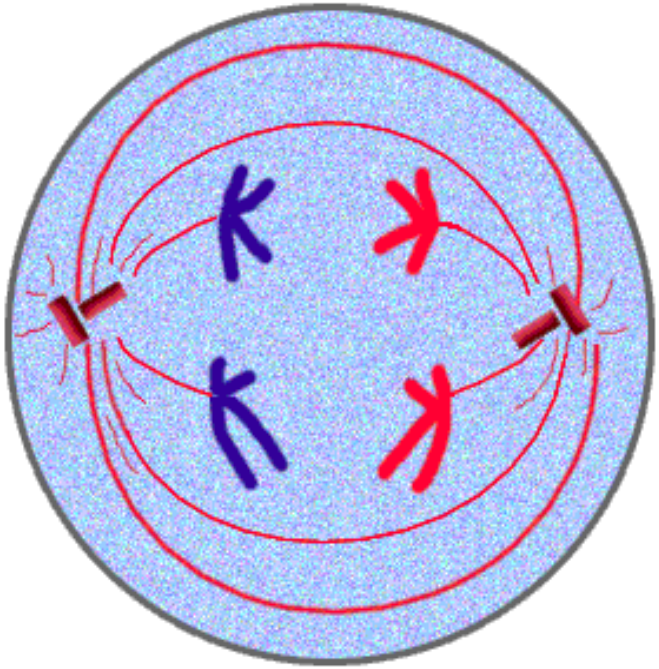
Meiosis Anaphase I



- **homologous chromosomes separate** and move along spindle fibres towards the poles or ends of the cell

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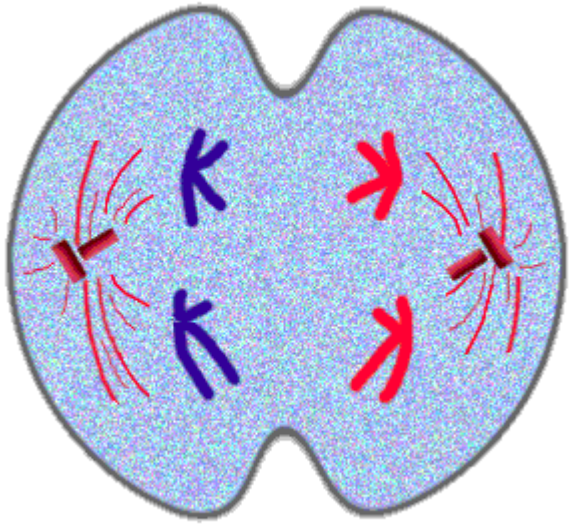
Meiosis Telophase I & Cytokinesis



The cell begins to divide into two daughter cells. It is important to understand that each daughter cell can get **any combination** of maternal and paternal chromosomes.

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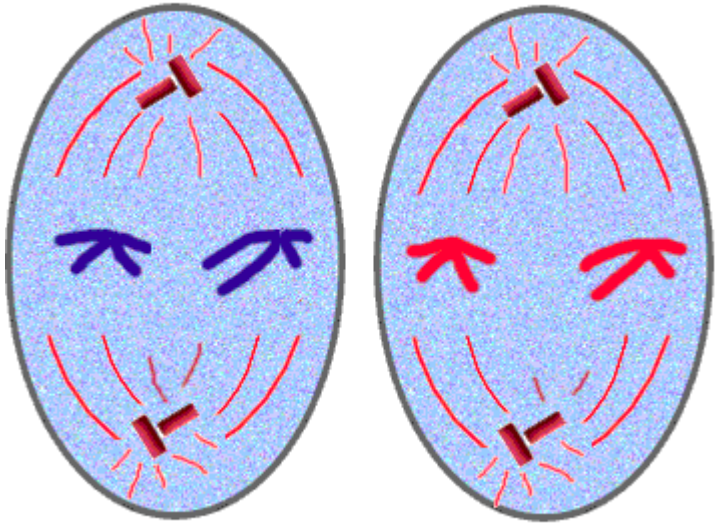
Meiosis Prophase II

The cell has divided into two daughter cells.



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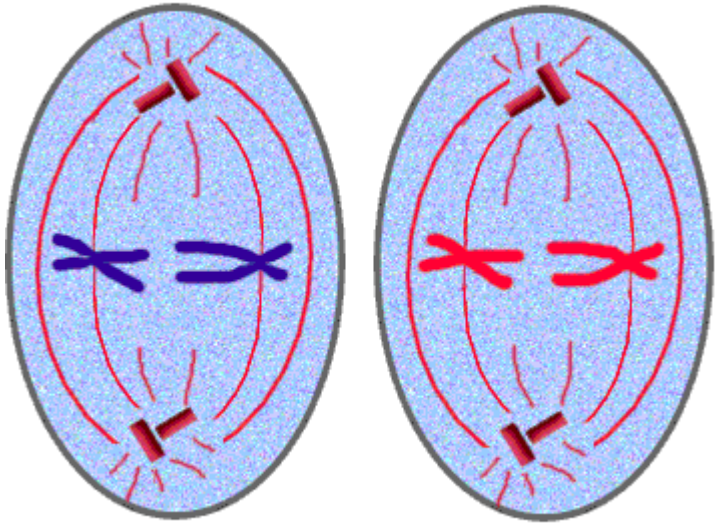
Meiosis Metaphase II



- As in Meiosis I, the chromosomes line up on the spindle fibers.
- Perpendicular to the way they were aligned in metaphase I

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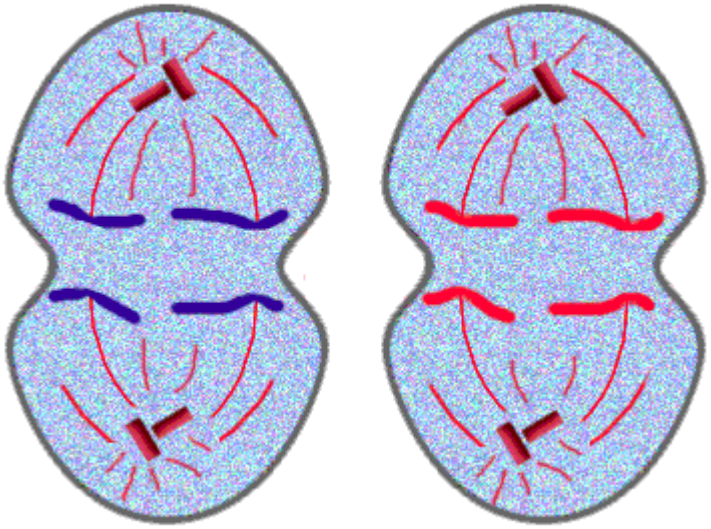
Meiosis Anaphase II



- Centromere splits and chromatids (single-stranded chromosomes) move to opposite ends

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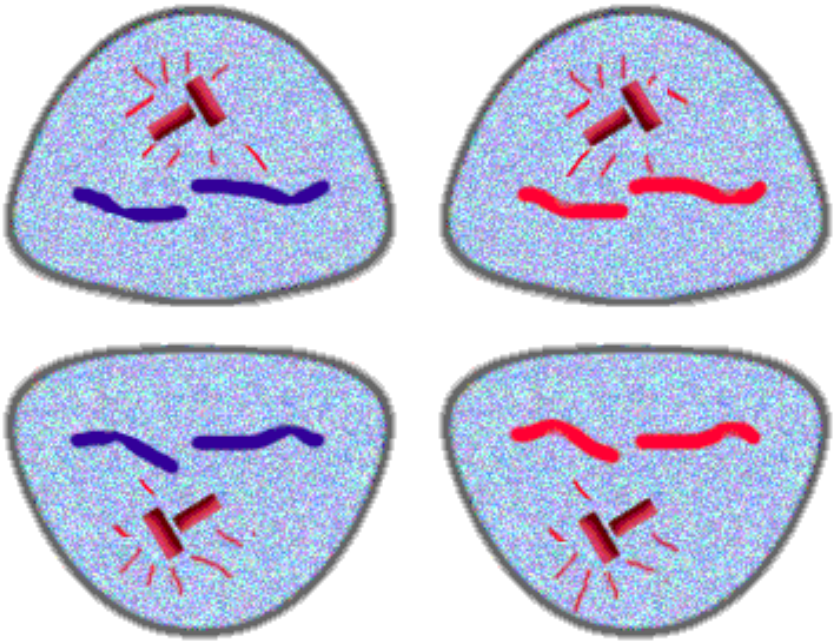
Telophase II & Cytokinesis



- With the formation of four cells, meiosis is over
- Each of these sex cells carry half the number of chromosomes of somatic cells. Therefore, we call them haploid (n).

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