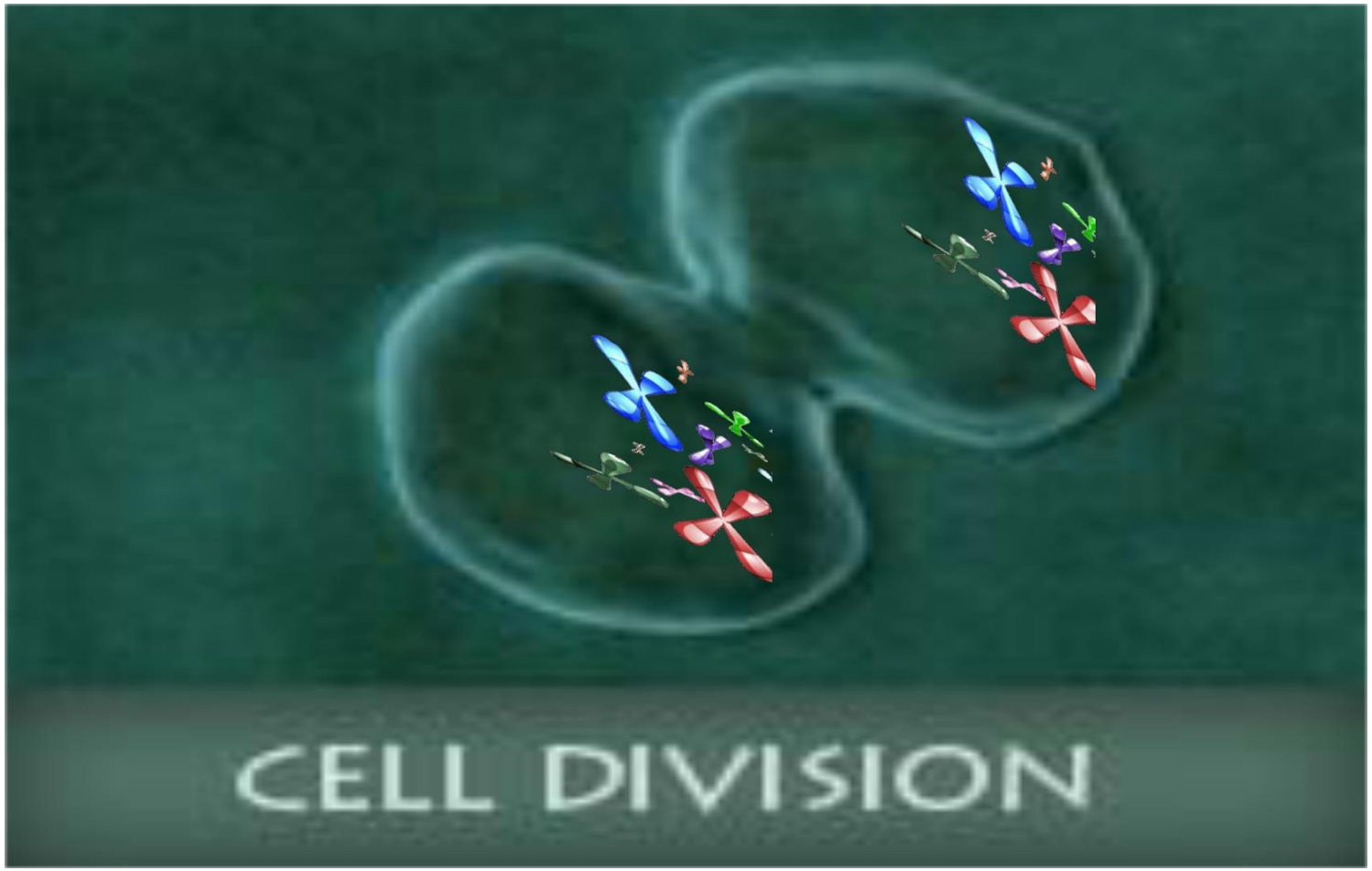

CELL DIVISION

CELL DIVISION

- Is the process by which a *parent cell* divides into two or more *daughter cells*.
- Cell division is usually a small segment of a larger cell cycle

CHROMOSOMES

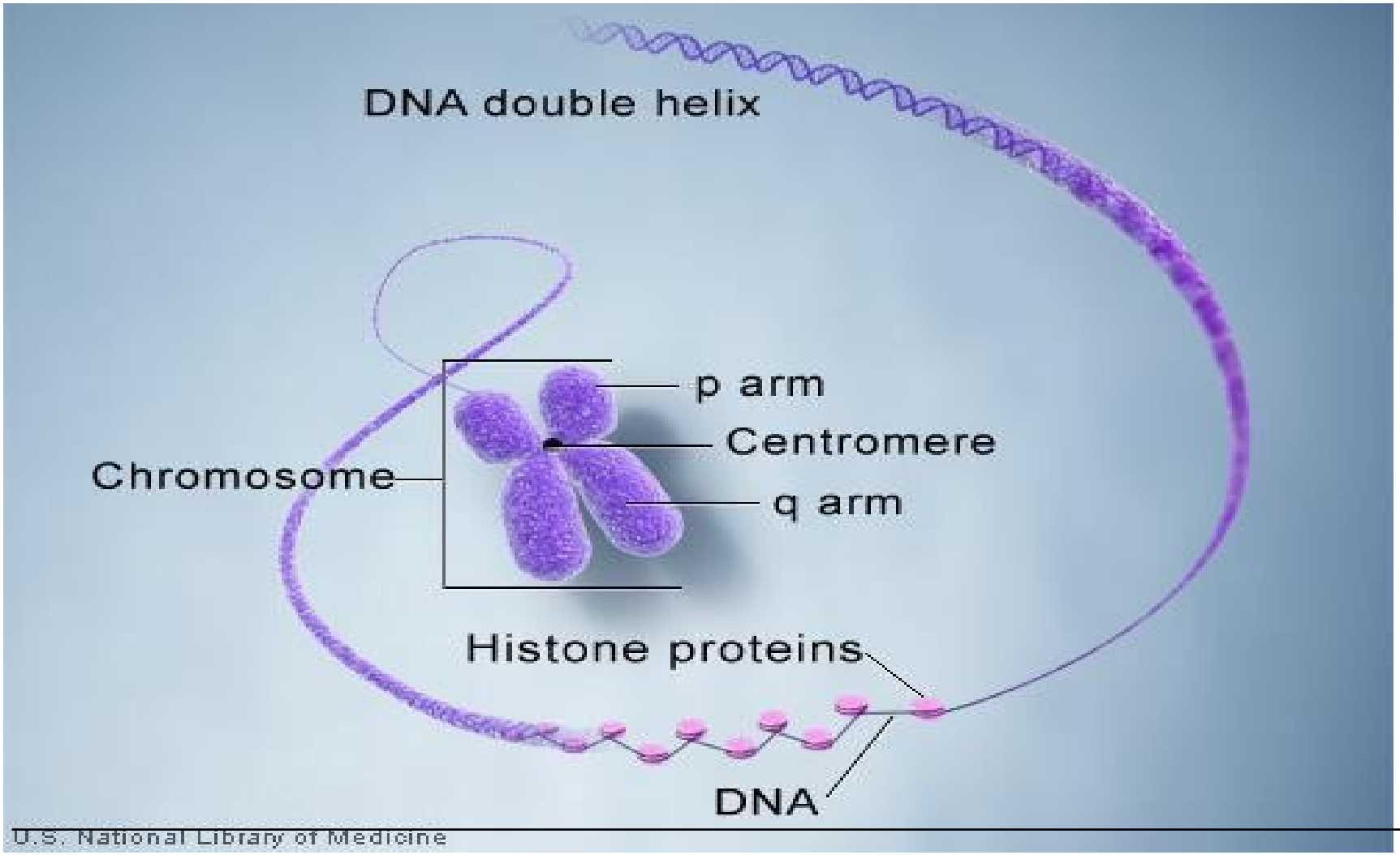
- **Are structures that transmit genetic information to next generation.**

Chromosome

DNA

 www.FirstRanker.com

CHROMOSOMES

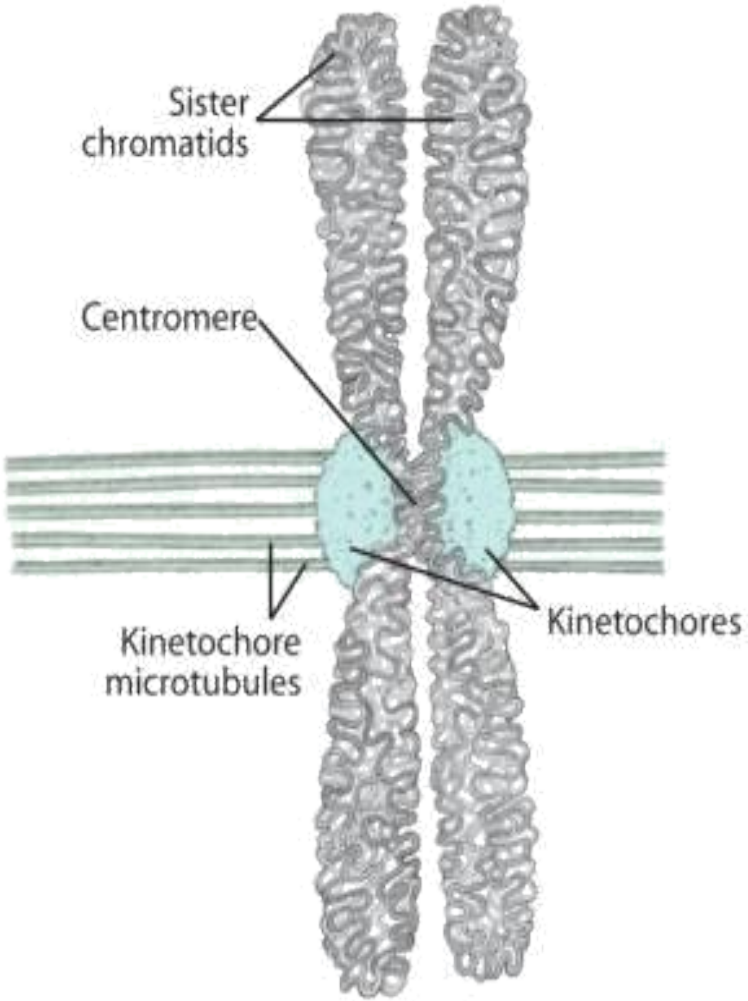


Chromatid

Two copies of the same chromosome attached together

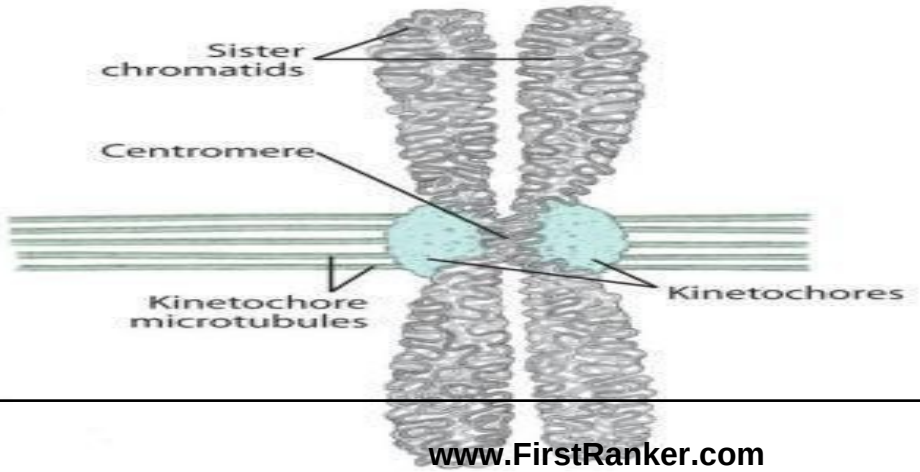
Centromere

Is the primary constriction where the sister chromatids are attached



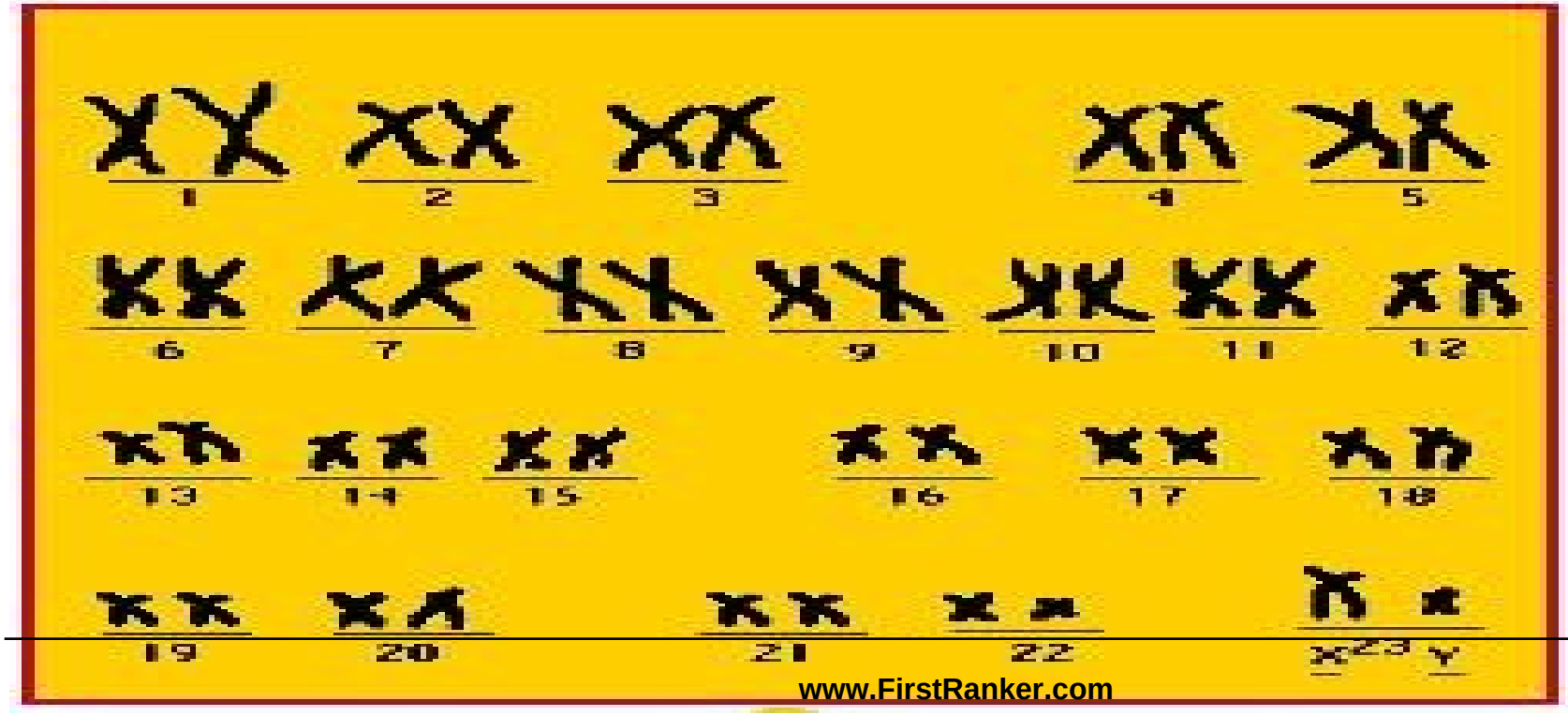
KINETOCHORE

- Is the protein structure that assembles on the centromere and attach sister chromatids to mitotic spindle; that move chromosomes during mitosis & meiosis.



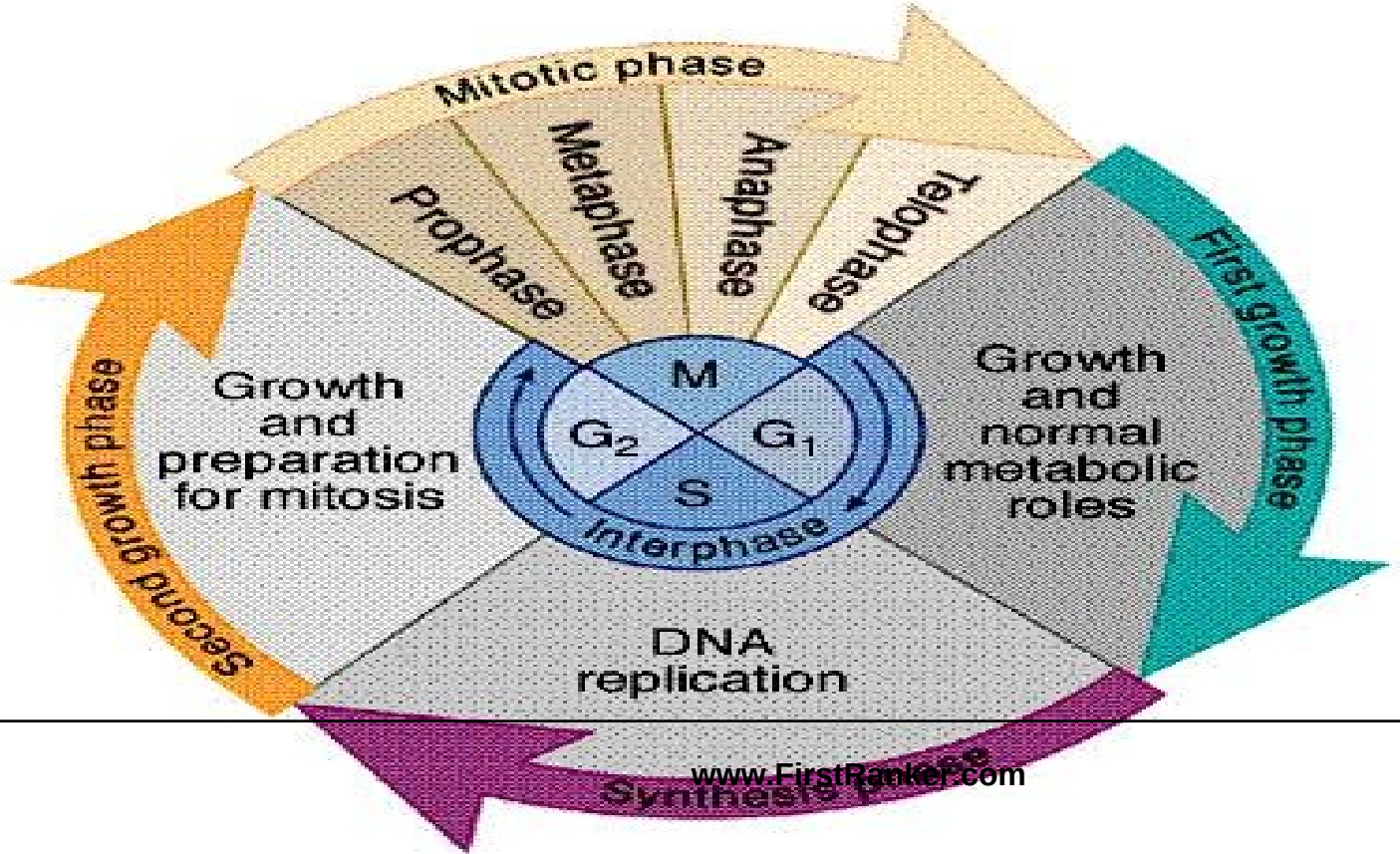
KARYOTYPE

A karyotype is the complete set of chromosomes in a specie. It describes the number of chromosomes, and what they look like under a light microscope.



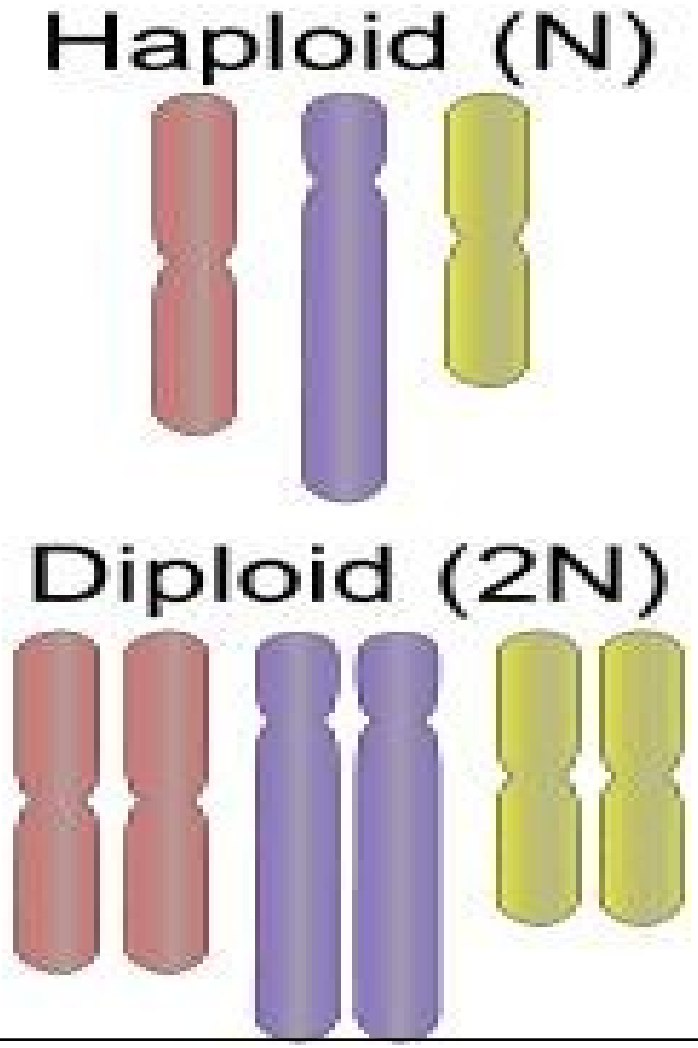
CELL CYCLE

- The cell cycle is an ordered set of events, culminating in cell growth and division into two daughter cells. Non-dividing cells not considered to be in the cell cycle.

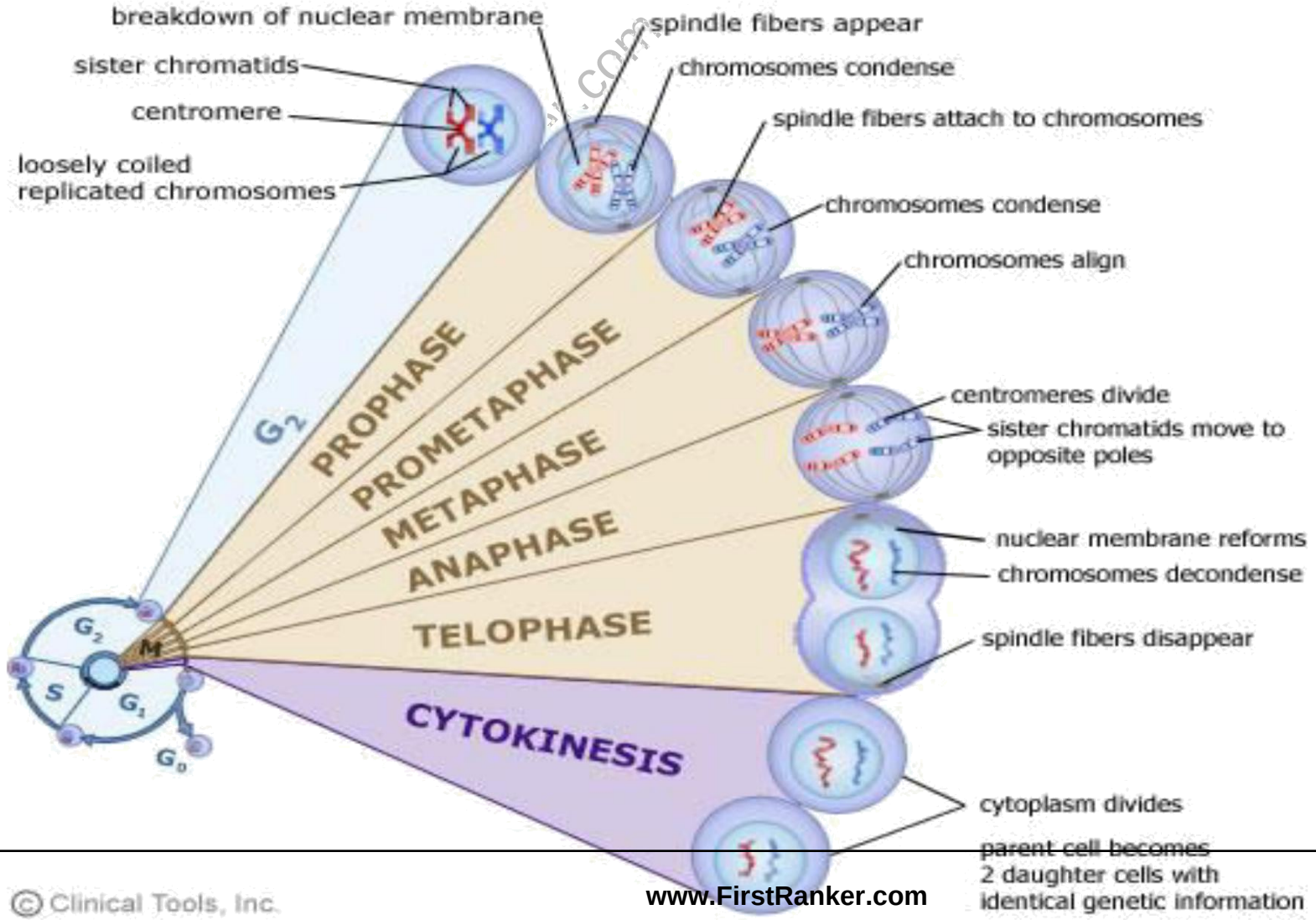


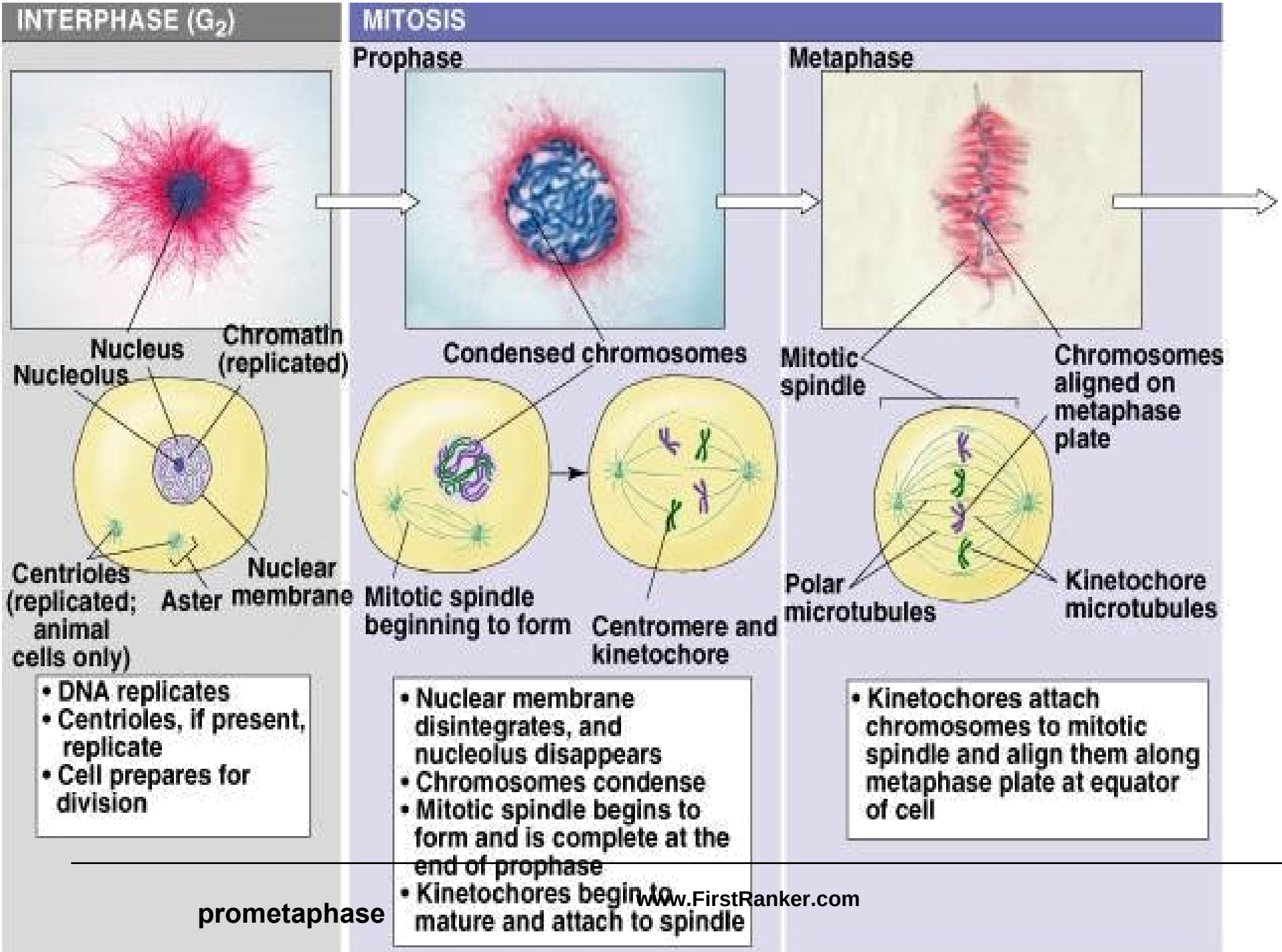
MITOSIS

- Is **nuclear division plus cytokinesis,** and produces two identical daughter cells
- **Mitosis** occurs in all somatic cells ---diploid (2n) cells

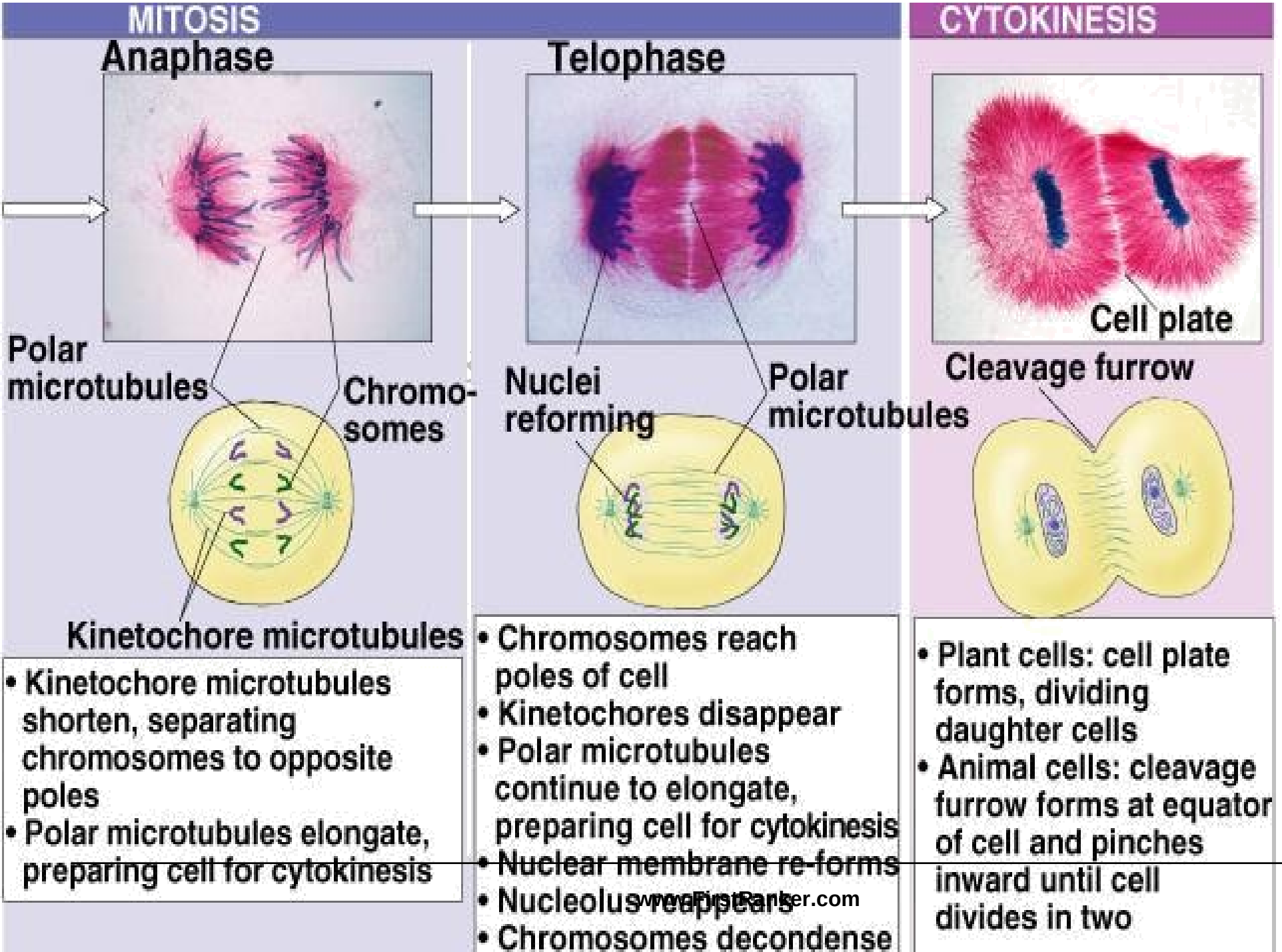


PHASES OF MITOSIS



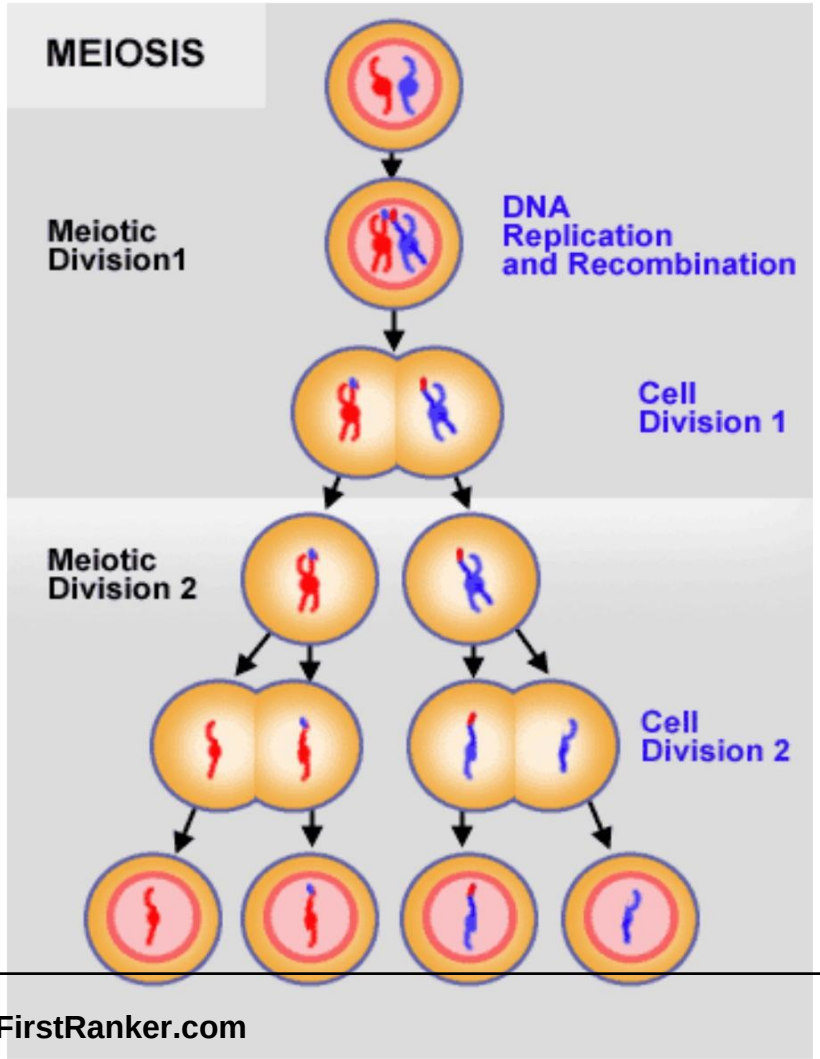


prometaphase

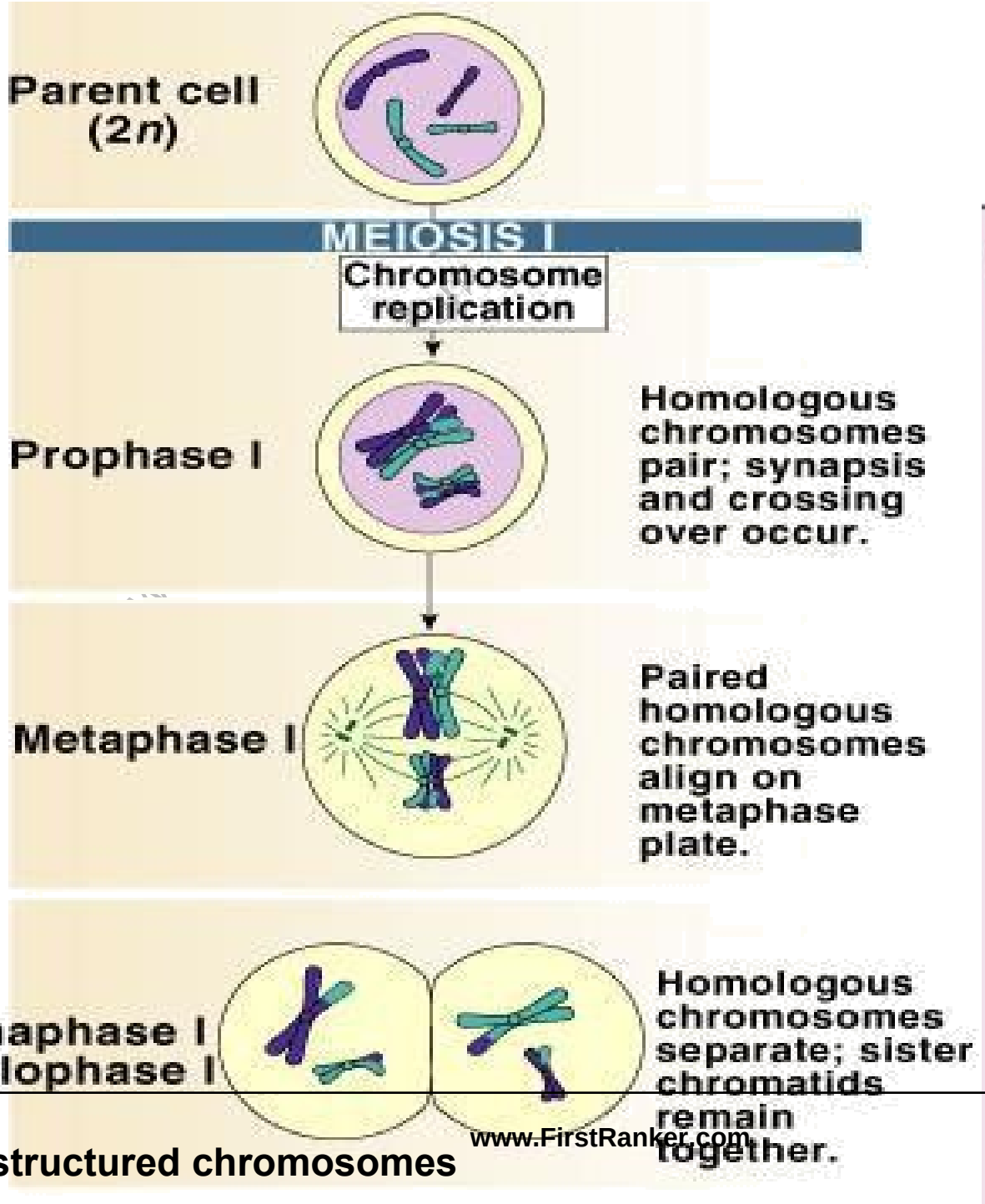


MEIOSIS

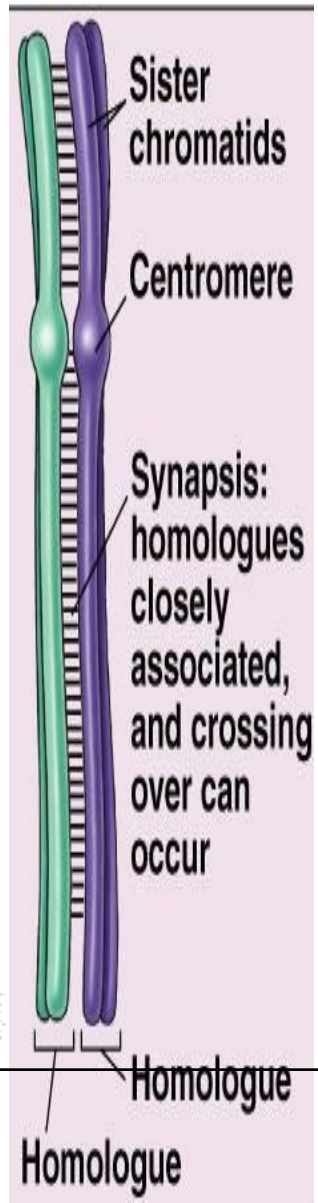
- Meiosis is the cell division that takes place in **germ cells** only.
- Requires two cell divisions
- Diploid germ cells give rise to **haploid (n)** gametes.



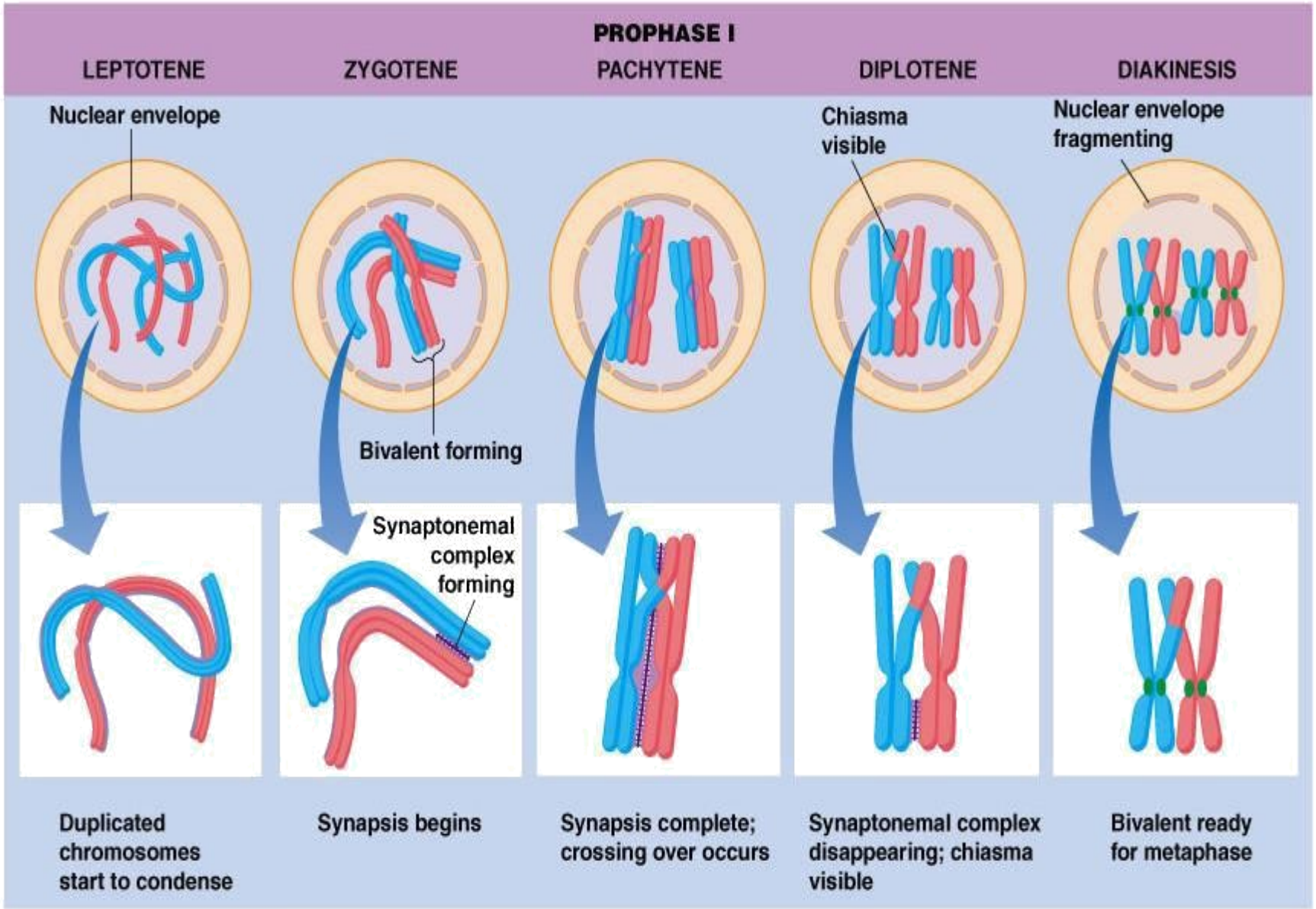
Primary oocyte or primary spermatocyte



Pair of homologous dyad (tetrad)



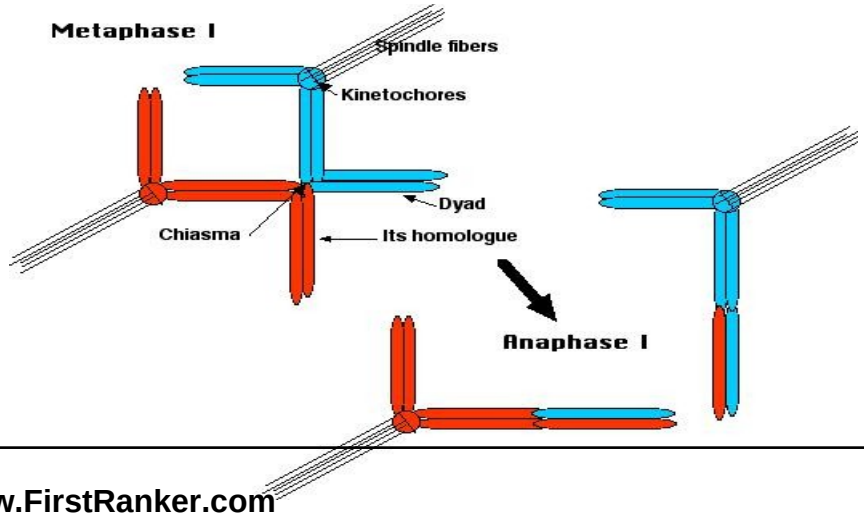
23 double structured chromosomes

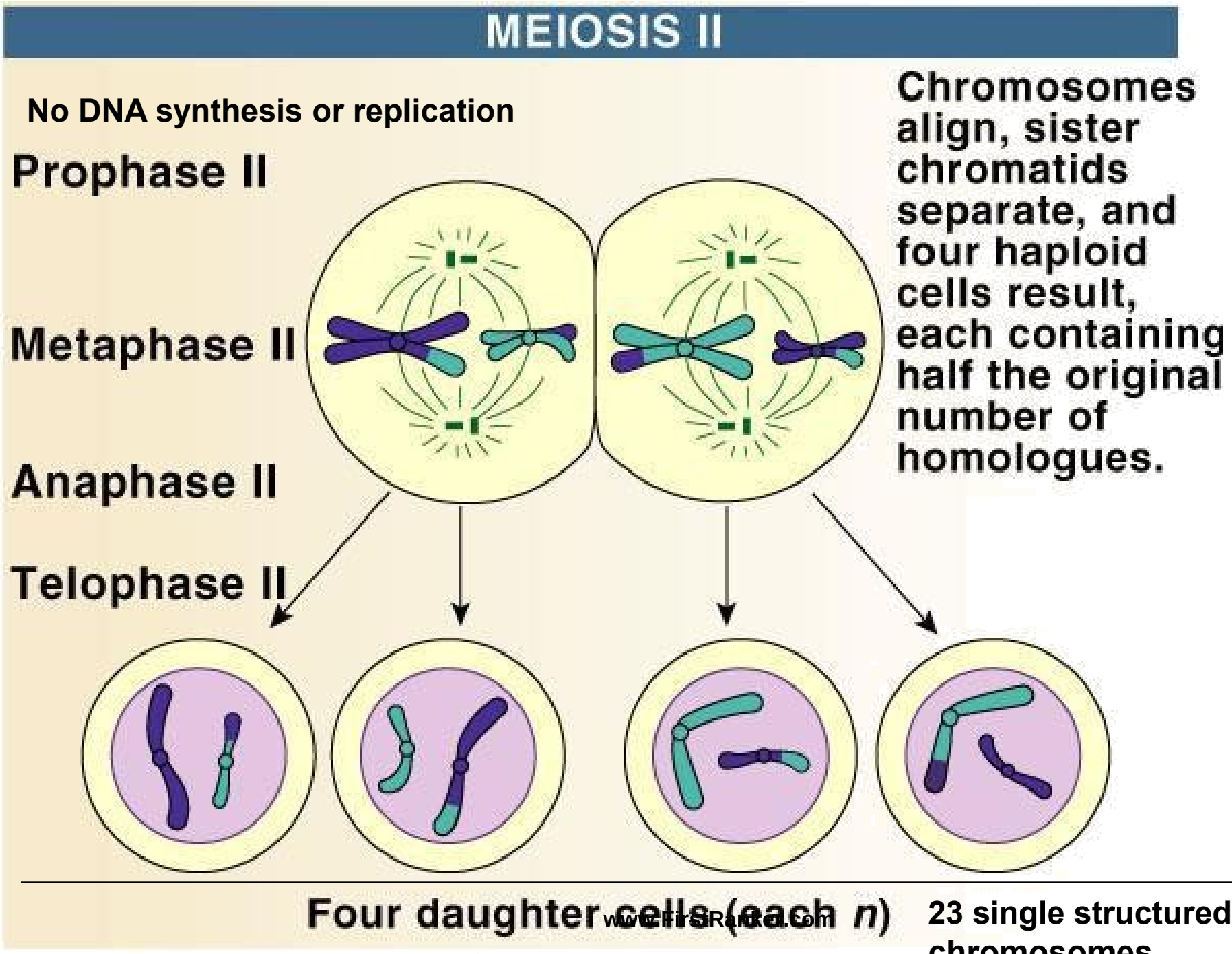


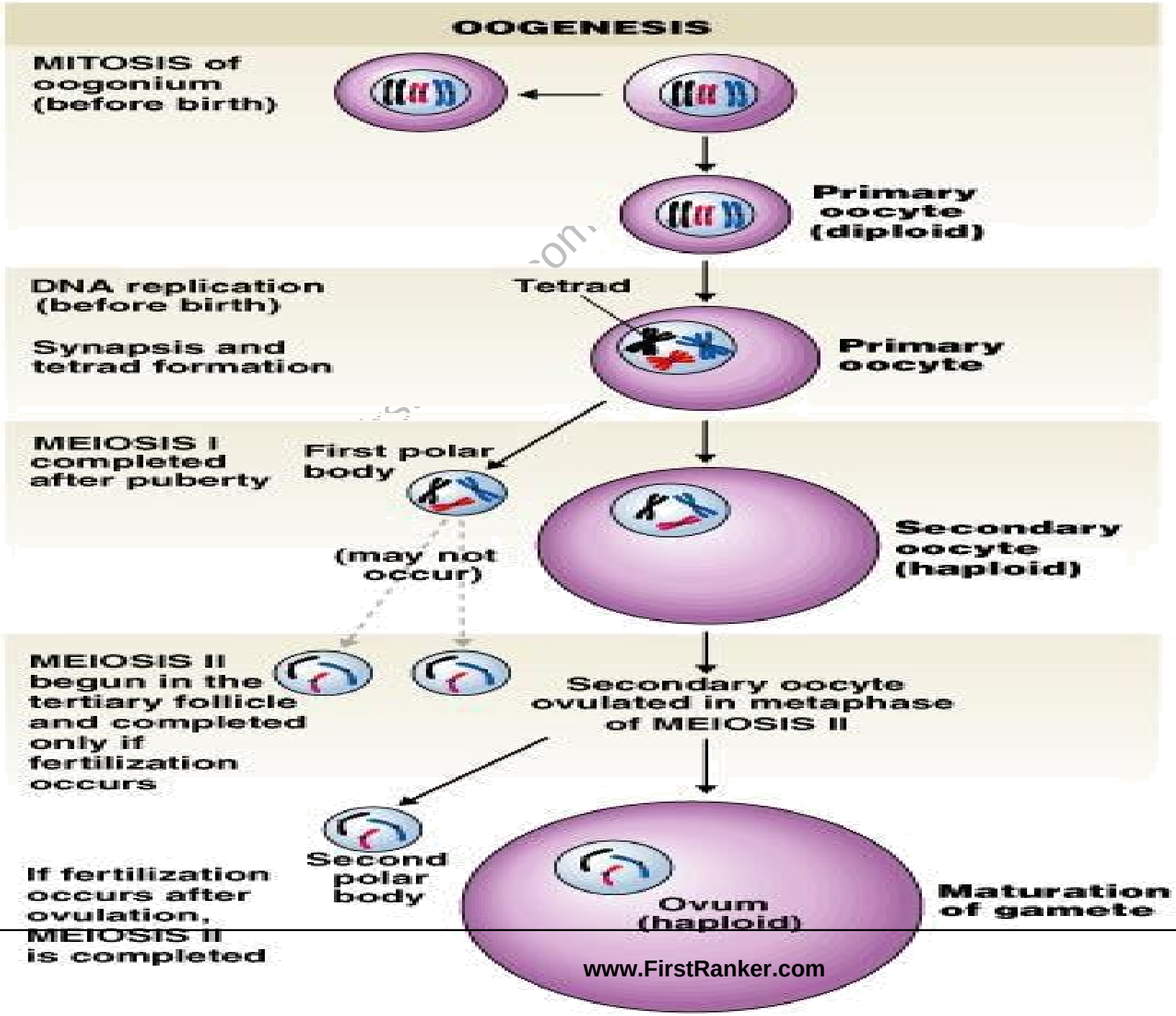
SPECIAL EVENTS IN MEOSIS

- **Pairing of homologous** chromosomes length wise is called **synapsis.**
- **Pairing is exact and point to point** except for X & Y chromosome
- **Cross overs** or interchange of chromatid segments between paired homologous chromosomes

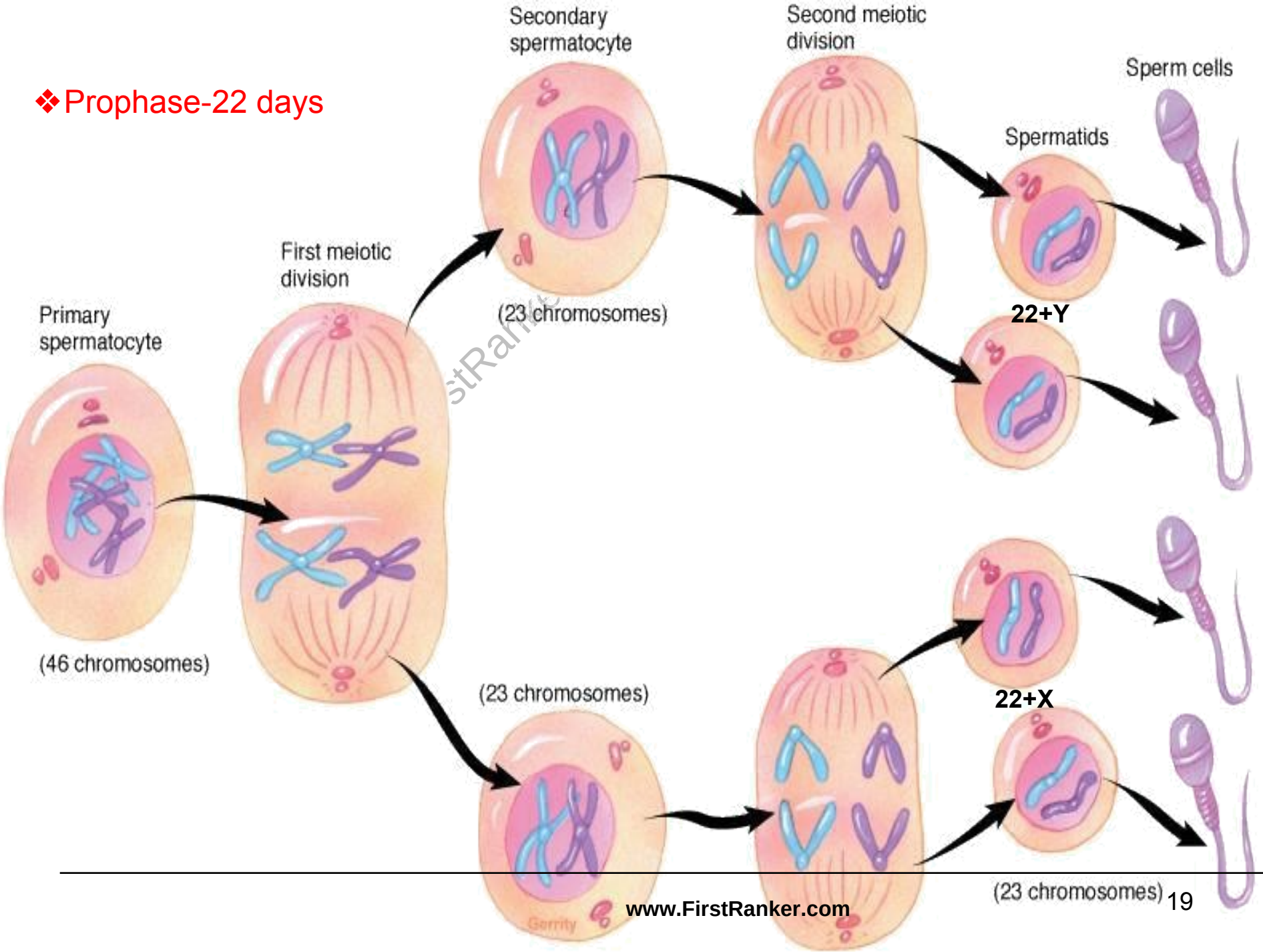
- As homologous chromosomes separate points of interchange are temporarily united and form an X like structure called **chiasma.**







❖Prophase-22 days



SIGNIFICANCE OF MEIOSIS:

- Provides ***constancy of the chromosome number***

  from generation to generation by reducing the chromosome number from diploid to haploid, thereby producing haploid gametes.

- Allows ***random assortment*** of maternal and paternal chromosomes between the gametes.

- Relocates segments of maternal and paternal chromosomes by crossing over of chromosome segments, which "shuffles" the genes and produces

a ***recombination of genetic material***.

- The stage of the cell cycle where each chromosome is composed of two chromatids in preparation for mitosis.

A. G1
B. S
C. M
D. G2

- Which of the following statements is NOT true of mitosis?
- **A.** A single nucleus gives rise to two identical daughter nuclei
- **B.** The daughter nuclei are genetically identical to the parent nucleus.
- **C.** The centromeres divide at the onset of anaphase.
- **D.** Homologous chromosomes synapse in prophase.

- Which sequence of the cell cycle is common to eukaryotes?

A. G1 to G2 to S to M to cytokinesis

B. G1 to M to G2 to S to cytokinesis

C. G1 to S to M to G2 to cytokinesis

D. G1 to S to G2 to M to cytokinesis

- The stage of the cell cycle where the cell is preparing to begin DNA replication is called:
- **A.** G1
- **B.** G2
- **C.** S

- **D. M**