LAB -8-

CELL DIVISION

- All cells are derived from per-existing cells (cell Theory).

-Cell division is the process by which cells produce new cells.

-Cell division differs in prokaryotes (bacteria) from eukaryotes (protests, fungi, plants and animals).

-Some tissues must be repaired often such as the lining of gut, white blood cells, and skin cells with a short lifespan.

-Other cells do not divide at all after birth such as muscle and nerve.

*Reasons for Cell division

- Cell growth

- Repair and replacement of damaged tissue parts.

- Reproduction of the species-

*Cell Cycle

-The cell cycle is the sequence of event that takes place in cells. It lead to cell division and replication (duplication).

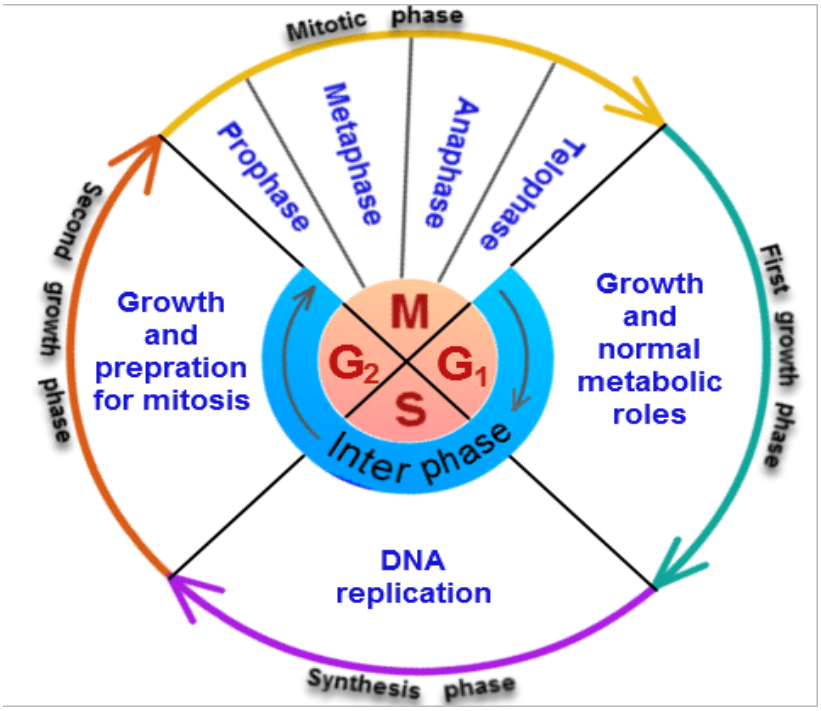
-The cell cycle includes 2 main parts **interphase,** and **cell division**.

-Cell division includes mitosis (nuclear division) and cytokinesis (division of the cytoplasm).

-Interphase is the longest part of a cells life cycle and is called the "resting stage" because the cell isn't dividing.

-Cells grow, develop, & carry on all their normal metabolic functions during interphase.

-Interphase consists of 3 parts –G1, S & G2 phases.



cell cycle

*Interphase

-G1 or 1st growth phase occurs after a cell has undergone cell division.

- Cells mature & increase in size by making more cytoplasm & organelles while carrying normal metabolic activities in G1.

- S or synthesis phase follows G1and the genetic material of the cell (DNA) is copied or replicated.

-G2 or 2nd growth phase occurs after S phase and the cell makes all the structures needed to divide.

1) Mitosis

*Stages of Mitosis

-Division of the nucleus or mitosis occurs first.

- Mitosis is an asexual method of reproduction.

- Mitosis consists of 4 stages: 1) Prophase, 2) Metaphase, 3) anaphase, 4) Telophase.

1) Prophase

- Chromosomes become visible when the condense into sister chromatids.

- Sister chromatids attach to each other by the centromere.

- Centrioles in animal cells move to opposite ends of cell.

- Spindle forms from centriole (animals) or microtubules (plants).

- Kinetochore fibers of spindle attach to centromere.

- Polar fibers of spindle extend across cell from pole to pole.

- Nuclear membrane dissolves.

- Nucleolus disintegrates.

2) Metaphase

-chromosomes line up in center or equator of the cell attached to kinetochore fibers of the spindle.

3)Anaphase

- kinetochore fibers attached to the centromere pull the sister chromatids apart.

- chromosomes move toward opposite ends of cell.

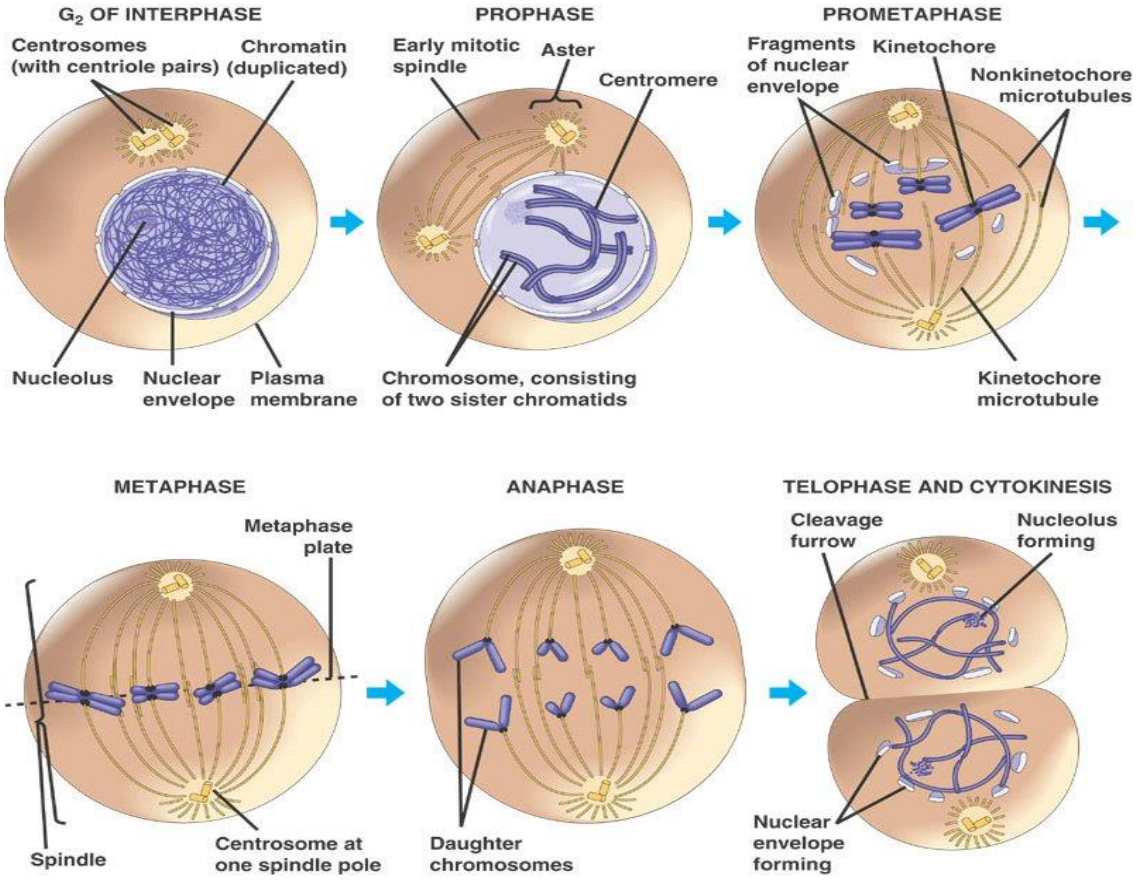
4)Telophase

- Nuclear membrane forms at each end of the cell around the chromosomes.

- Nucleolus reform.

- Chromosomes become less tightly coiled & appear as chromatin again.

- Cytokinesis begins.

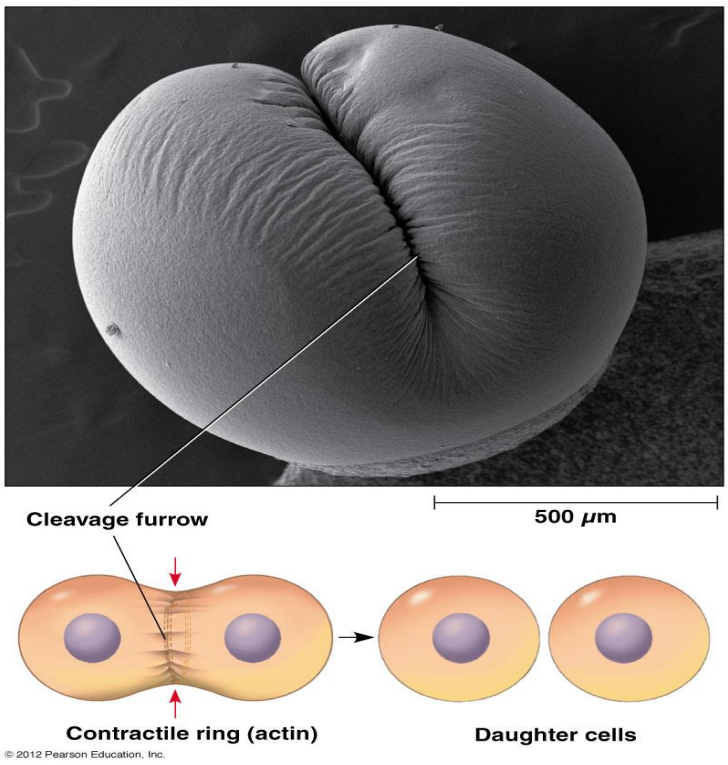


Stages of mitosis division

*Cytokinesis

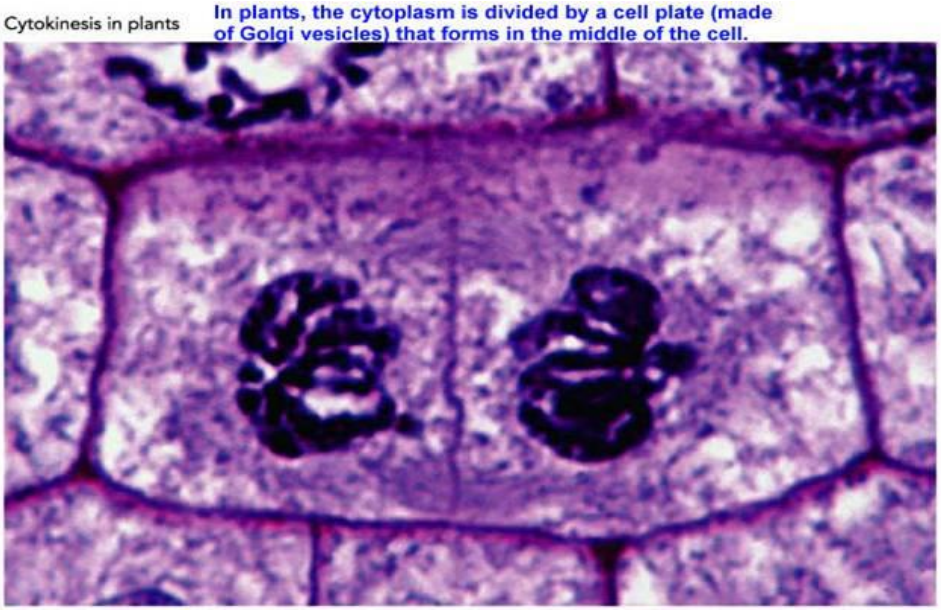
- Cytoplasm of the cell and its organelles separate into 2 new daughter cells.

- In animals, a groove called the cleavage furrow forms pinching the parent cell in two.



Cytokinesis in animals (cleavage furrow)

- - in plant, a cell plate forms down the middle of the cell where the new cell wall will be.



Cytokinesis in plants