Mitosis

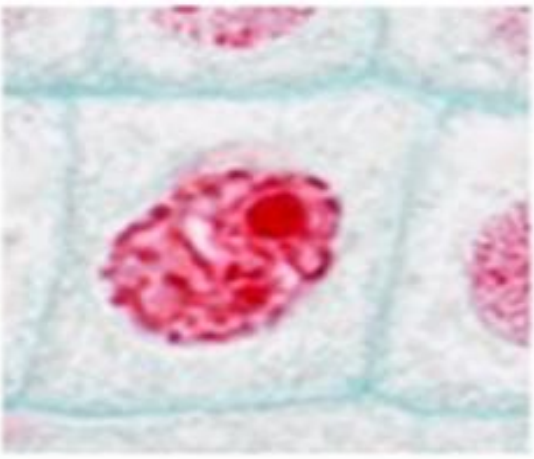
Mitosis is a type of cell division in which one cell (the mother) divides to produce two new cells (the daughters) that are genetically identical to it. In all of these cases, the "goal" of mitosis is to make sure that each daughter cell gets full set of chromosomes.

Phases of mitosis

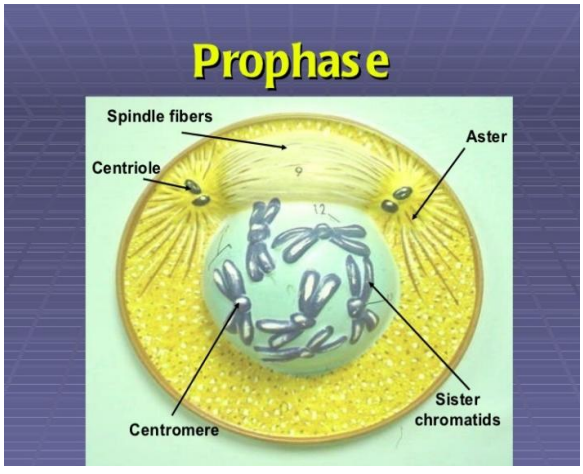
Mitosis consists of four basic phases: (Prophase, Metaphase ,Anaphase and Telophase).

1-Prophase

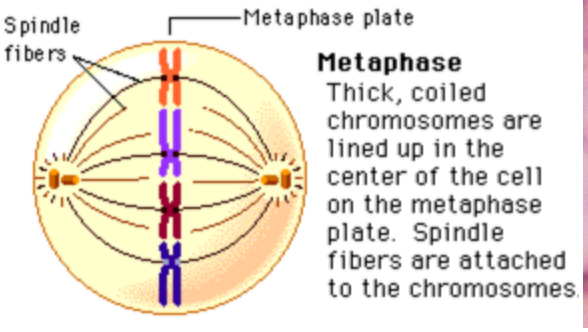
The chromosomes start to coil, shorten, and become distinct. The mitotic spindle or polar fibers begin to form from the poles of the cell towards the equator.



Prophase in microscope

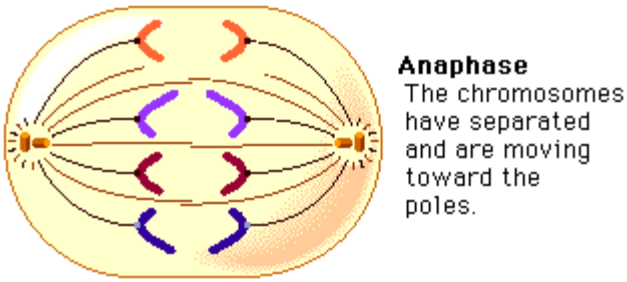


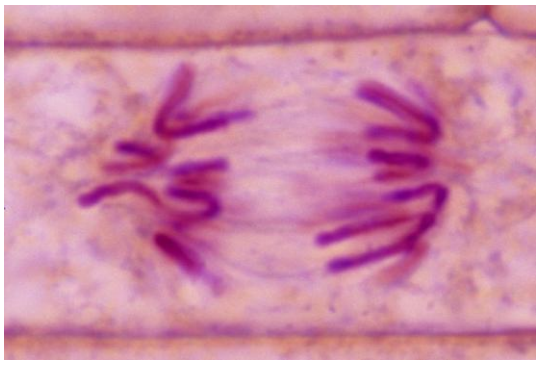
2- Metaphase : is characterized by the lining up of the chromosomes along the equator of the cell or what is called the **metaphase plate**.



Metaphase in microscope

3- Anaphase: the sister chromatids separate at the centromeres thus can now be called chromosomes. These are pulled to the poles of the cell by the mitotic spindle.

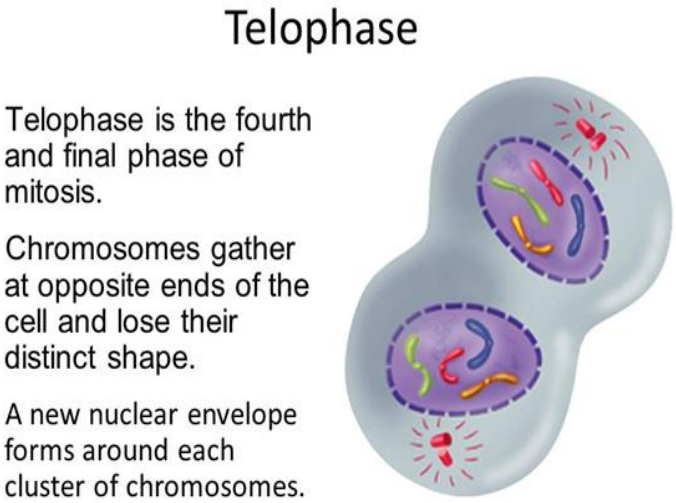




Anaphase in microscope

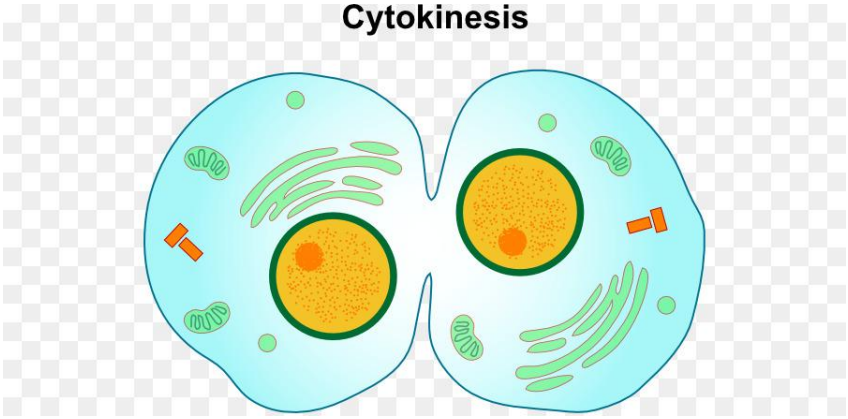
4-Telophase

In **telophase**, the cell is nearly done dividing, and it starts to re-establish its normal structures as cytokinesis (division of the cell contents) takes place.



Telophase in microscope

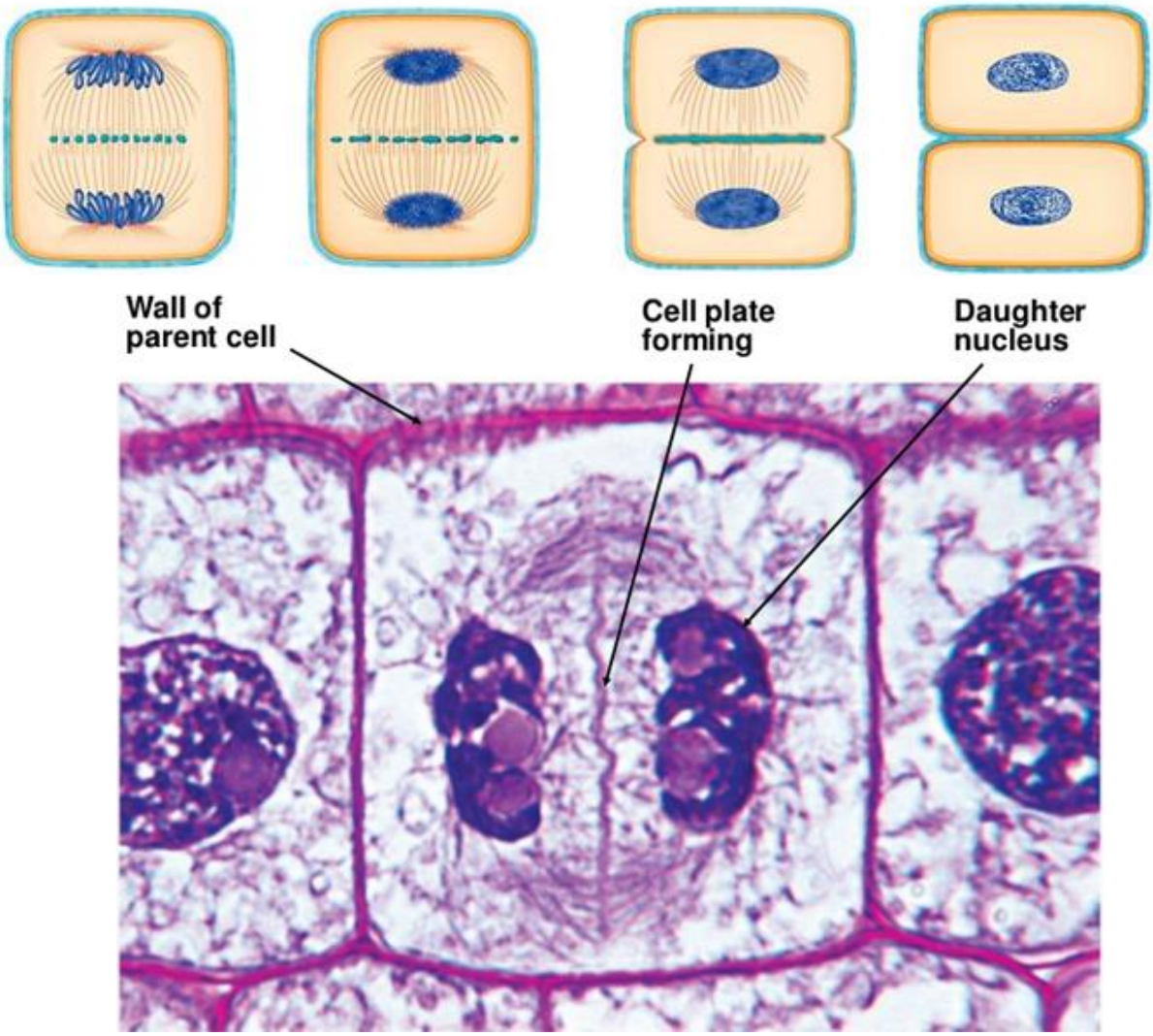
Cytokinesis: the division of the cytoplasm to form two new cells, overlaps with the final stages of mitosis. It may start in either anaphase or telophase, depending on the cell.



In animal cells, cytokinesis starts by splitting the cell inward, then dividing the cell into two cells. **In plant cells,** cytokinesis starts by forming the cell plate down the middle of the cell. When cytokinesis finishes, we end up with two new cells, each with a complete set of chromosomes identical to those of the mother cell.

Cytokinesis: Plant Cells

- Cell Plate Formation



Cytokinesis: Animal Cell

- Cleavage furrow