

Unit 5 (Ch. 9 & 10.1) Cellular Reproduction Notes

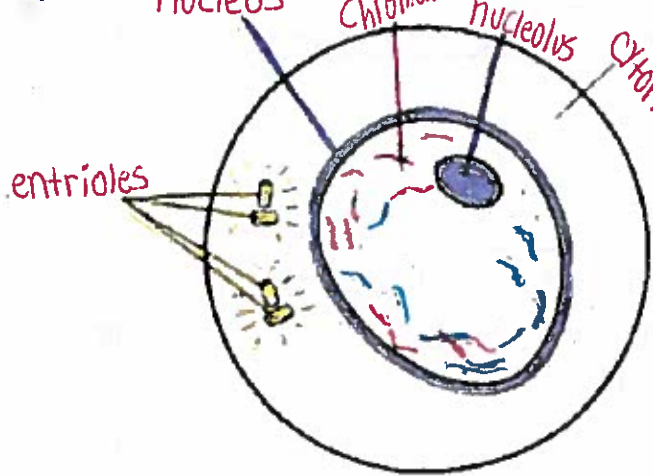
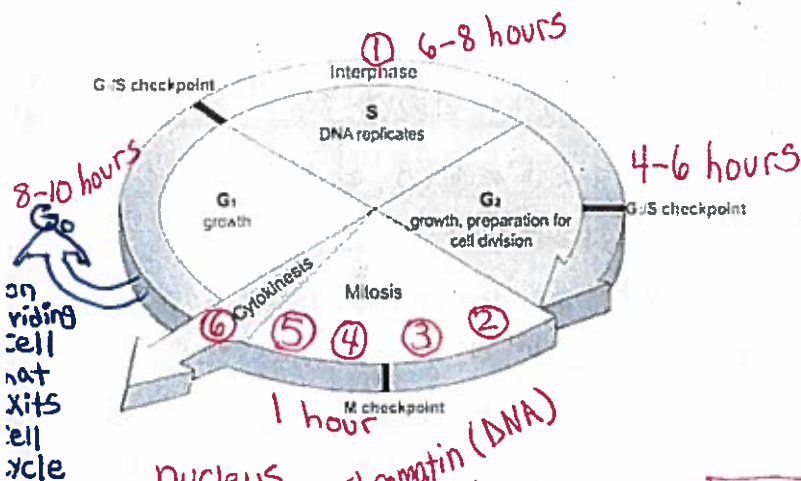
Cell Cycle

According to the cell theory, cells come from Pre existing cells.

The Cell cycle is the life of the cell.

Cell Cycle (3 Main Stages)

- Interphase
- Mitosis (Prophase, Metaphase, Anaphase, Telophase)
- Cytokinesis



Interphase - 1st Stage of Cell Cycle

Cells spend most ^{90%} of their life in Interphase.

Cells perform their functions/jobs during Interphase.

Cells grow and the organelles double during G₁ of Interphase.

DNA replication (DNA copied) occurs during S of Interphase.

Cells continue to grow and prepare to divide during G₂ of Interphase.

There are 3 checkpoints in the cell cycle regulated by cyclins and CDK enzymes.

Cell nucleus is visible and DNA is in string-like form called Chromatin.

① Interphase

Mitosis (4 Phases: Prophase, Metaphase, Anaphase, Telophase) – 2nd Stage of Cell Cycle

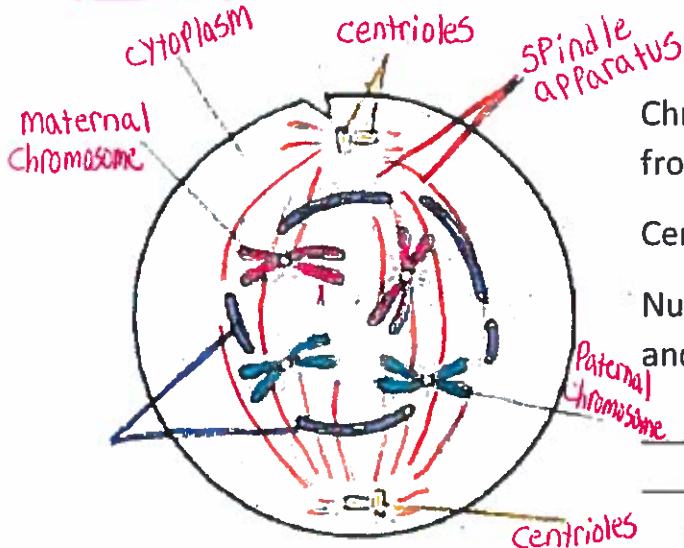
Division of the cell's NUCLEUS.

The DNA copies/chromosomes are separated in 4 main phases.

Mitosis creates 2 genetically identical body cells (somatic cells) ^{diploid (2n)}.

Mitosis is important for Growth and Repair of an organism. (adds cells to living organism)

Prophase



Chromosomes each have 2 Sister Chromatids from DNA replication in S of Interphase.

Centrioles begin to move apart to opposite Poles of cell.

Nuclear membrane breaks down and the NUCLEUS/NUCLEOLUS disappears.

Chromatin condenses into visible Chromosomes.

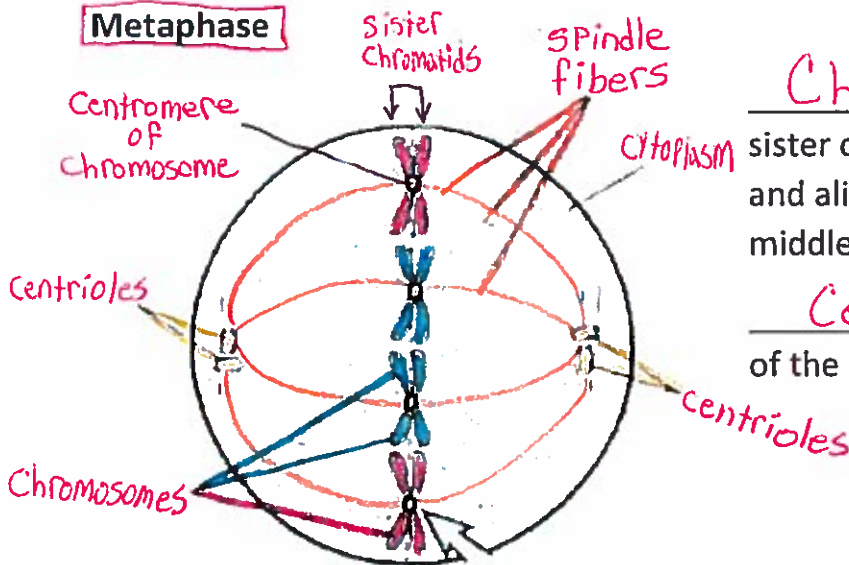
Spindle apparatus begins to form from the Centrioles at both poles of the cell.

The spindle attaches to the Centromeres of the chromosomes.

"Before"

② Prophase

Metaphase



Chromosomes each consisting of two sister chromatids attach to the spindle apparatus and align along the equator or middle of the cell.

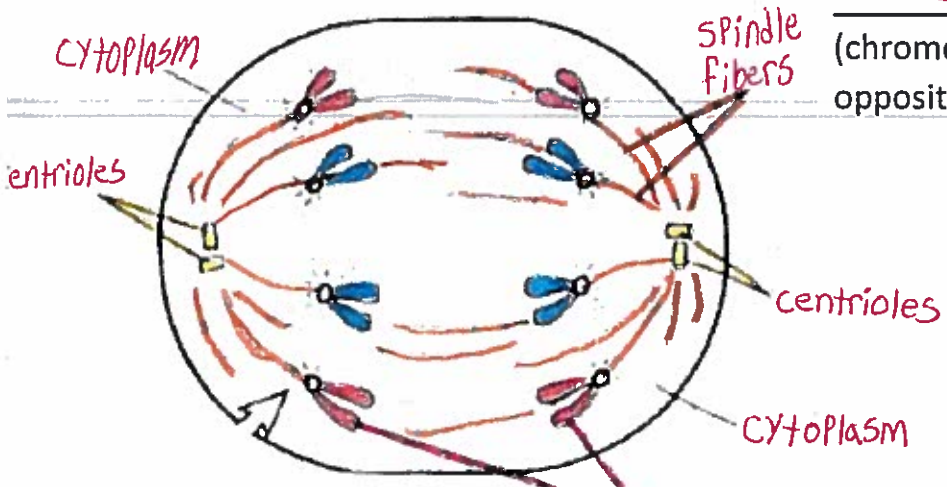
Centrioles are at opposite poles of the cell.

③ Metaphase

"Meet in Middle" Phase

"Marriage" Phase

Anaphase



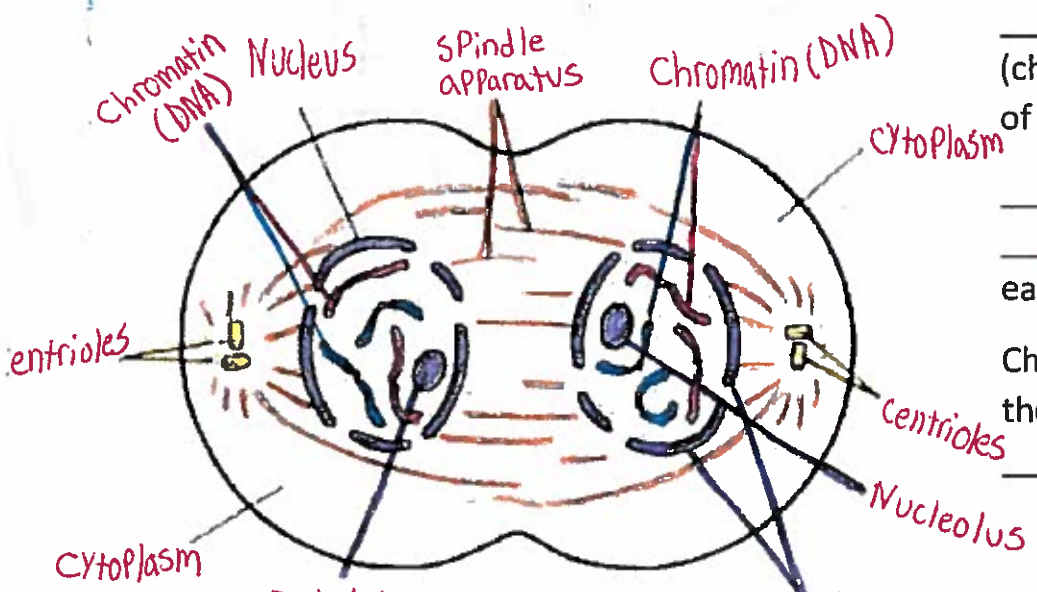
Sister chromatids (chromosomes) separate and move toward opposite poles of the cell.

④ **Anaphase**

"Divorce" Phase
 ♂ ♀

Sister Chromatids (Chromosomes)

Telophase



Sister Chromatids (chromosomes) reach the poles of the cell.

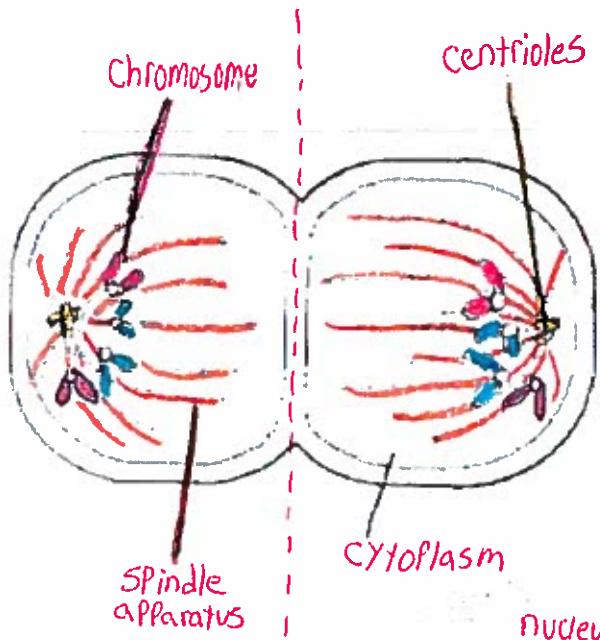
Nucleus and Nucleolus reform at each end of the cell.

Chromosomes/DNA returns to the string-like form called Chromatin.

⑤ **Telophase**

"Telephone" Phase

Cytokinesis – 3rd Stage of Cell Cycle



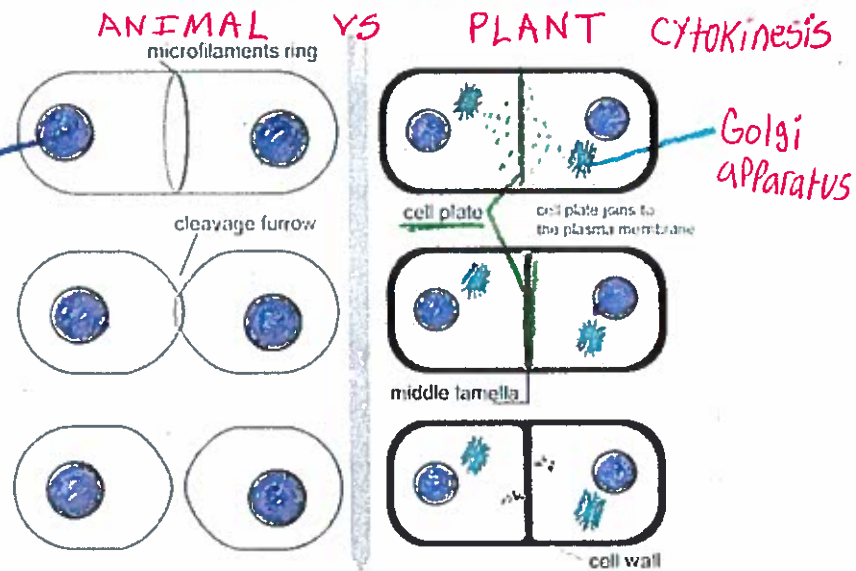
Division of the cell's CYTOPLASM.

Cytokinesis in Animal Cells vs Plant Cells:

In animal cells, a Cleavage furrow forms and Pinches the cell into 2 cells.

In plant cells, a Cell Plate forms from the Golgi apparatus and joins to the Plasma membrane.

⑥ **Cytokinesis**
Cell SPlits into 2 cells



- ① Interphase "I"
- ② Prophase "Promised"
- ③ Metaphase "Mother"
- ④ Anaphase "A"
- ⑤ Telophase "Telephone"
- ⑥ Cytokinesis "Charlie"

RESULTS OF CELL CYCLE (MITOSIS)

- 2 identical body (Somatic) diploid (2n) cells with the same number of Chromosomes. In humans, there are 46 chromosomes in each body/somatic cell.
- Important for growth and rePair of living organisms.