

# Cell Division and Reproduction

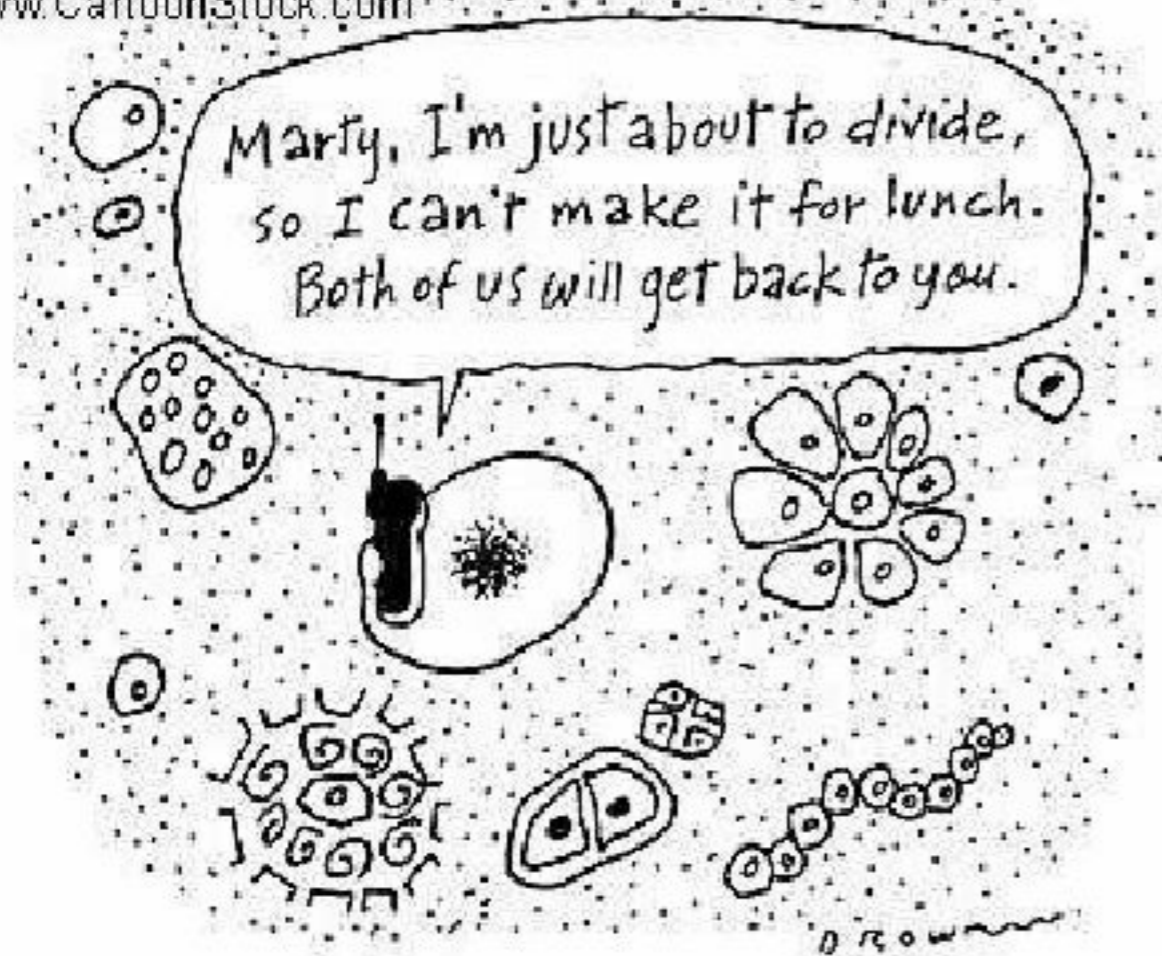


# Cell Division

© Original Artist

Reproduction rights obtainable from

[www.CartoonStock.com](http://www.CartoonStock.com)



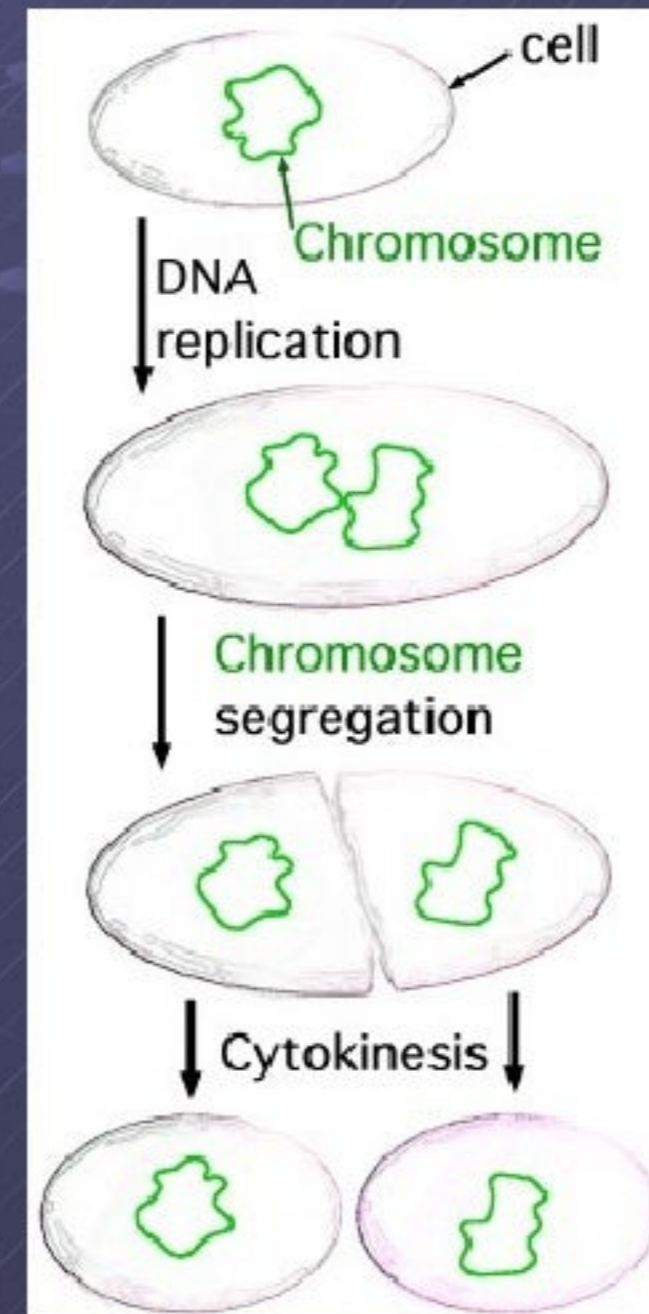
THE CELLULAR PHONE

- The process in which a cell, called a parent cell divides and produces new cells, called daughter cells.
- The primary concern of cell division is the maintenance of the original cell's Genome (genes).



# Binary Fission

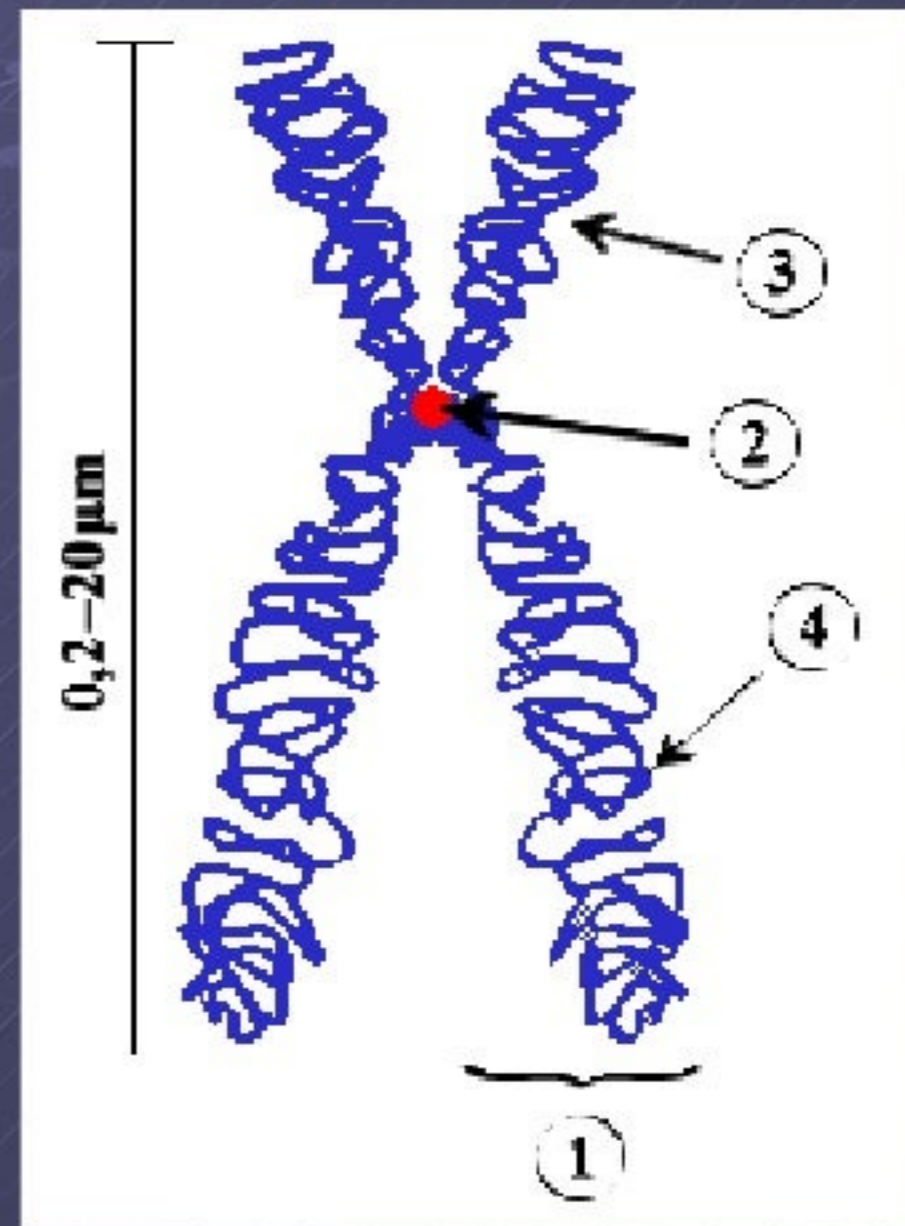
- Prokaryotic cells use the process of Binary Fission.
- There are only three steps in this process
  - 1: Copy DNA
  - 2: Separate DNA
  - 3: Divide Cell
- Each new cell receives an identical copy of genes.



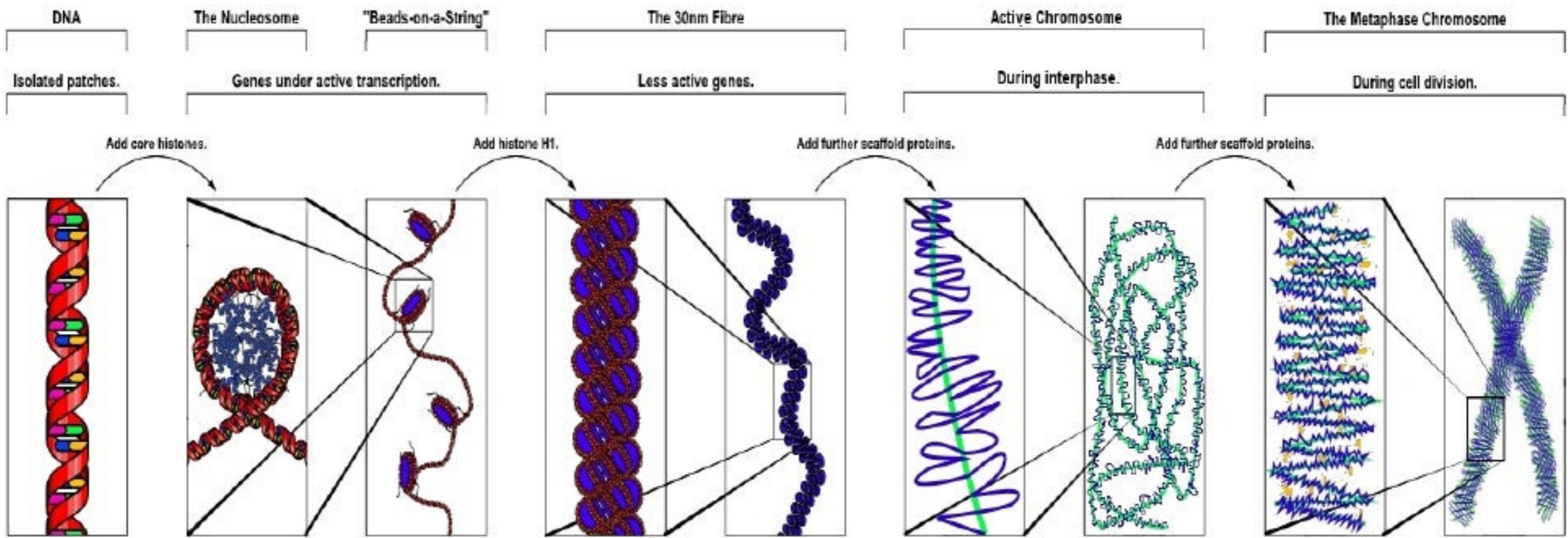


# Organization of DNA

- Before replication DNA is organized into Chromosomes.
- Chromatid - one of the two identical parts of the chromosome. Called “sisters”.
- Centromere - Point of attachment.







# Mitosis



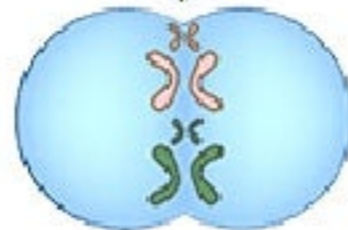
Chromosomes replicate to form chromatids



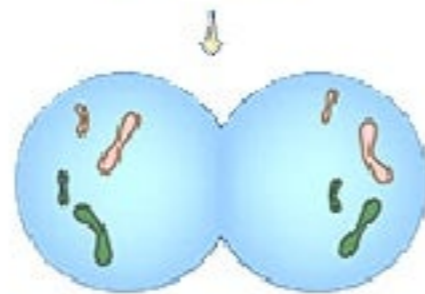
Chromatids line up along centre



Chromatids pulled apart and move toward poles



Nucleus divides



Two daughter cells both have same number of chromosomes as parent cell





# Mitosis

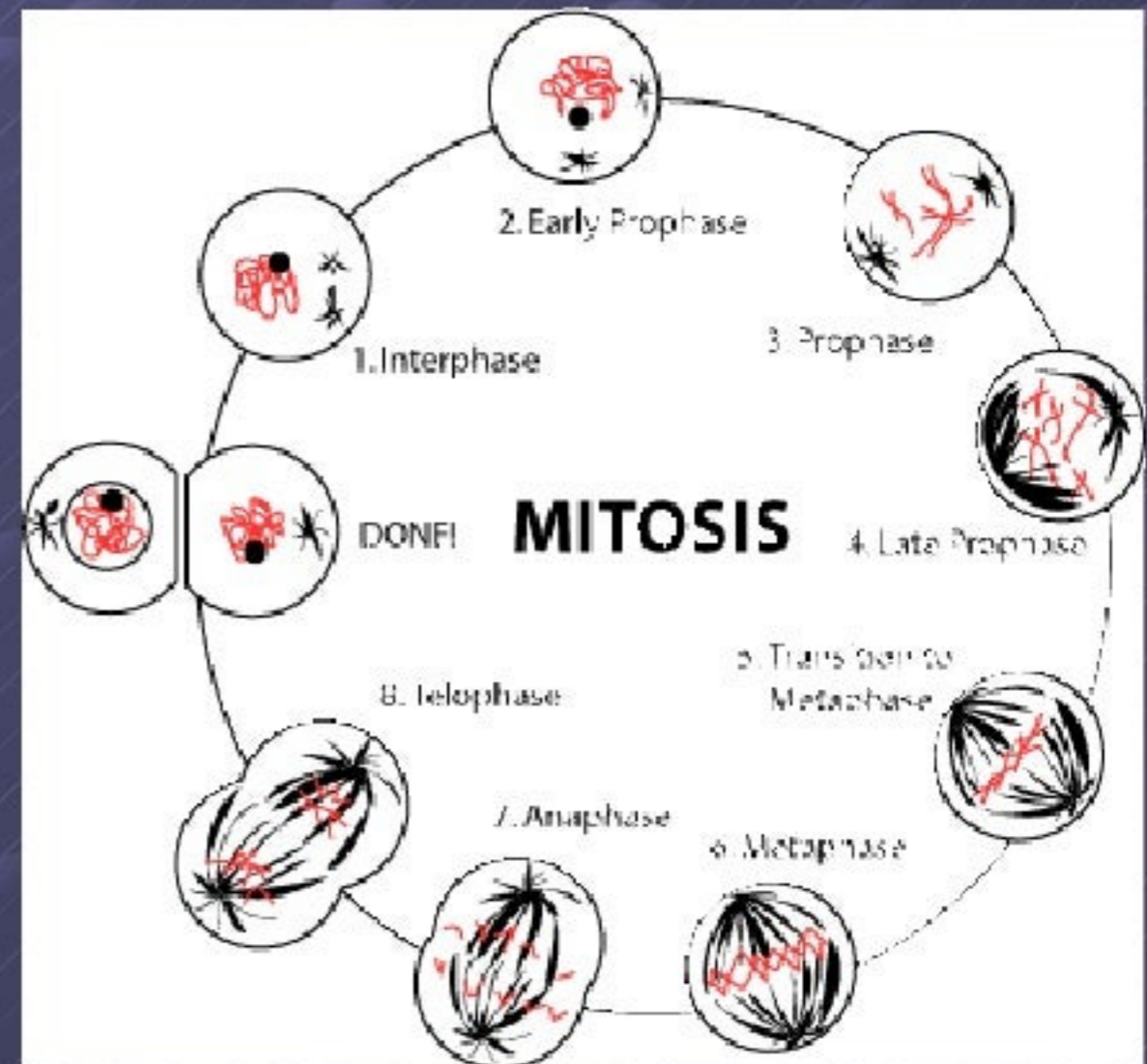
- The process in which a cell copies its DNA and divides to create two new daughter cells.
- Also called Eukaryotic cell division.
- Why perform Mitosis? When is it used?
  - To create new cells
  - To replace damaged or old cells
  - Growth



# The phases of Mitosis

## IPMAT

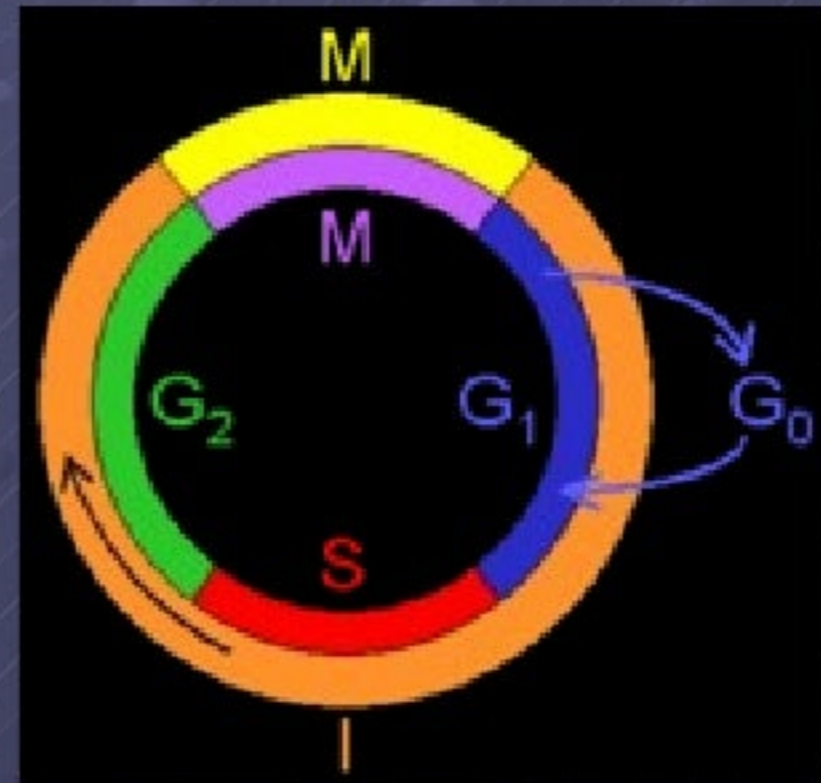
- Interphase
- Prophase
- Metaphase
- Anaphase
- Telophase





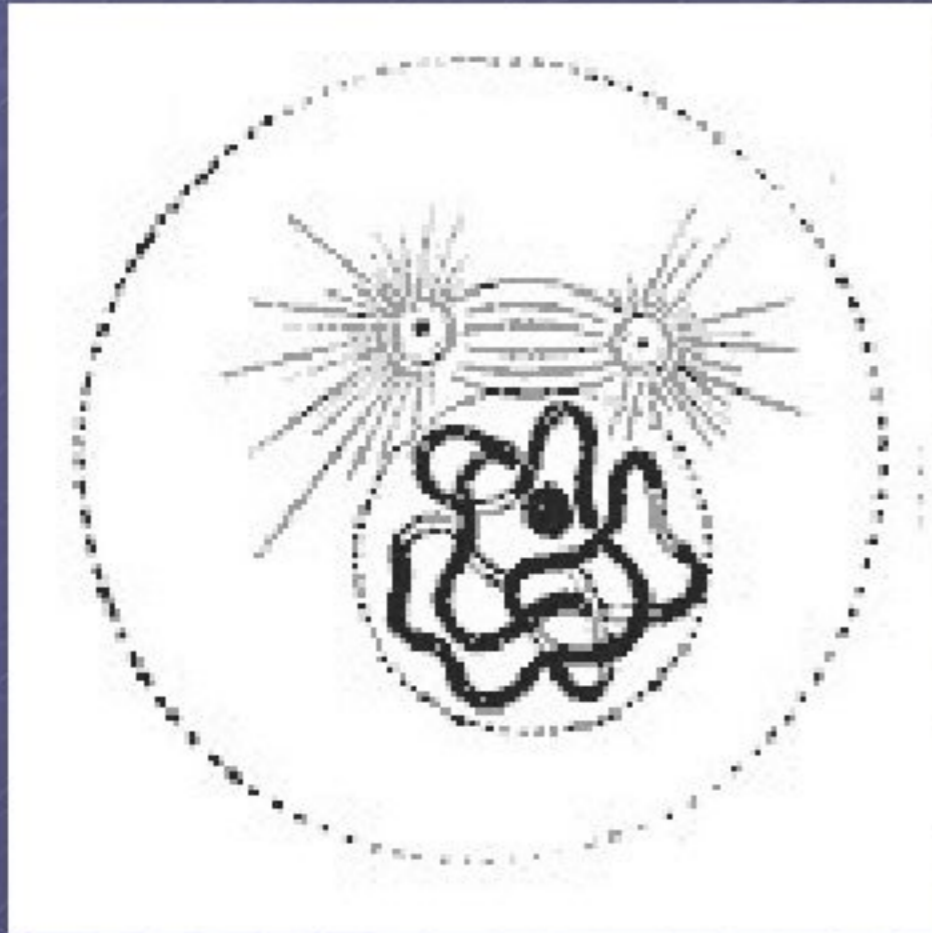
# Interphase

- The normal cell life cycle includes periods of replication and a resting stage.
- The cell prepares for division by replicating DNA.





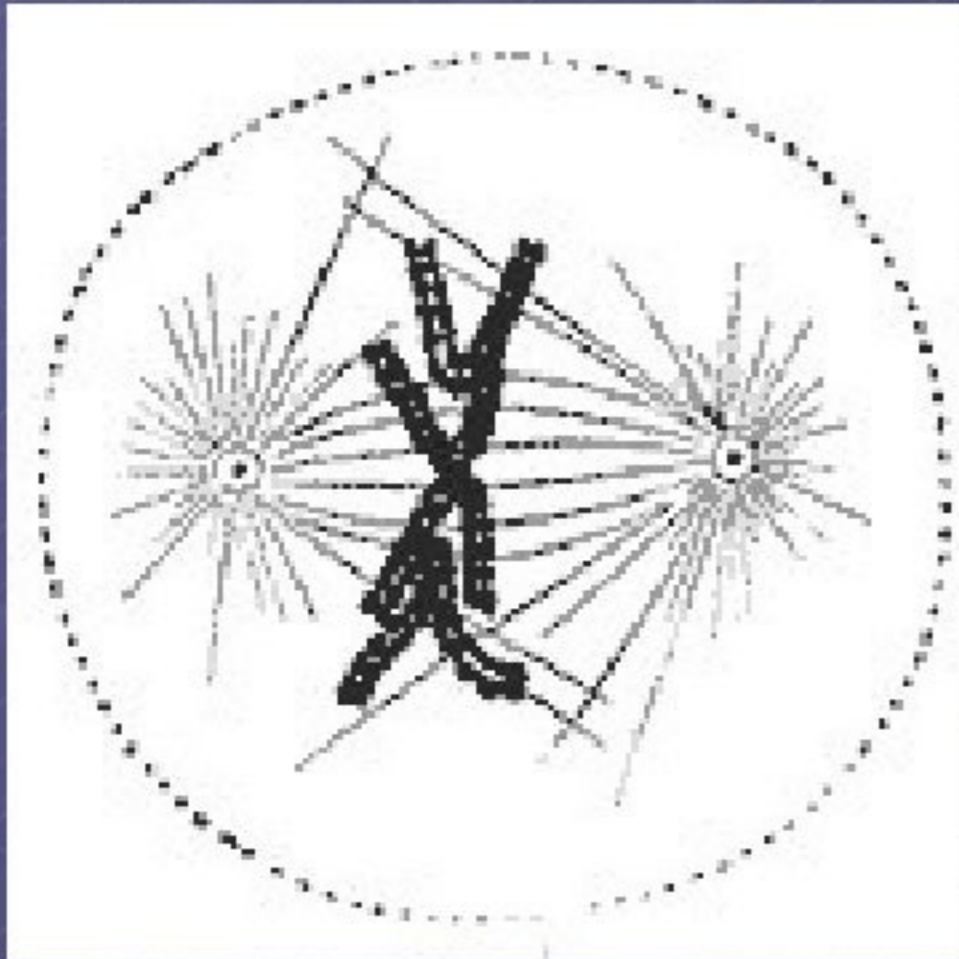
# Prophase



- The first phase of actual mitosis.
- DNA condenses into chromosomes from chromatin.
- Centrosomes start assembling microtubules, these are called spindle fibers.



# Metaphase

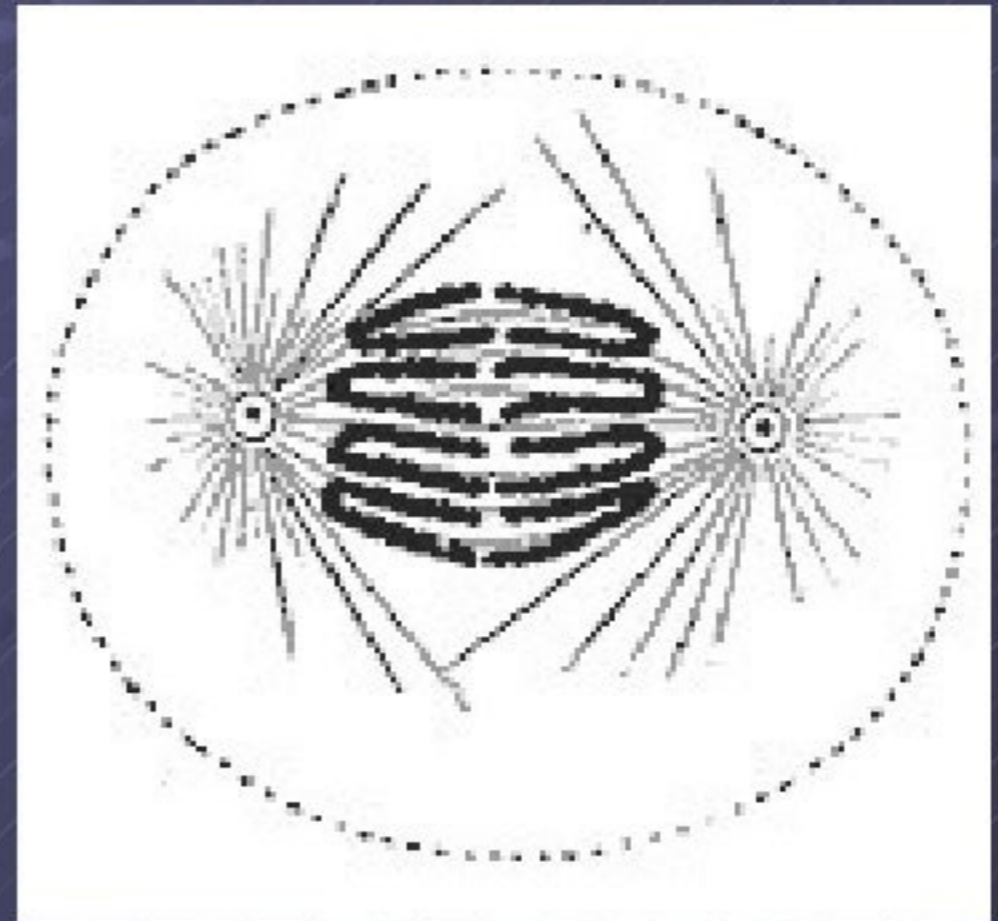


- Chromosomes line up along the metaphase plate.
- The spindle fibers attach to the centromeres of the chromosomes.



# Anaphase

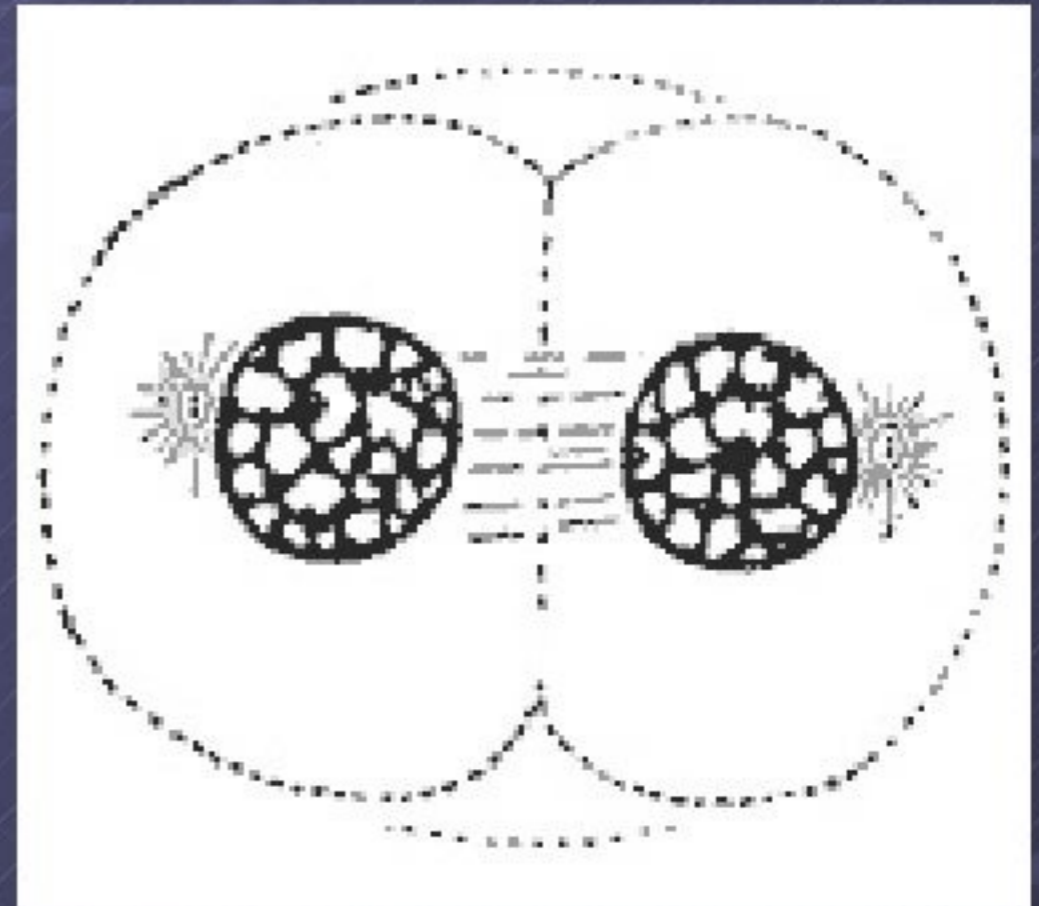
- Spindle fibers begin to pull chromosomes to opposite ends of the cell.
- In the process, the chromosomes are ripped apart, separating the sisters.





# Telophase

- Clean up phase.
- Nuclear membranes begin to reform.
- Chromatids unwind.
- Cell begins to divide in two.





# Cytokinesis

- The final stage in the mitotic cycle.
- It is when the cell splits in two.
- All organelles are equally distributed between the two daughters.
- Finally two new identical cells are created.



# Cells Alive

Mitosis Interactive Website