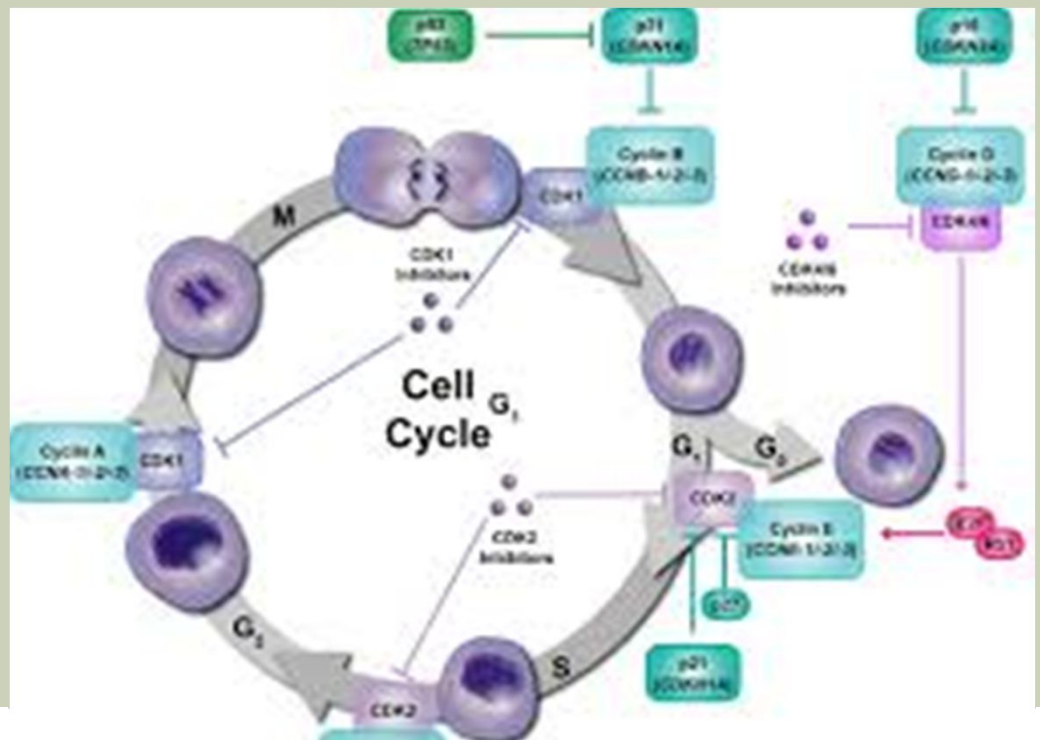


# MITOSIS AND CYTOKINESIS

Section 9.2

# MITOSIS

- Process of nuclear and cytoplasm division
- Cell's genetic material is duplicated
- Genetic material separates into two cells
- DNA must separate perfectly intact so the two "daughter" cells are identical
- Stages:
  - Interphase
  - Prophase
  - Metaphase
  - Anaphase
  - Telophase
  - Cytokinesis

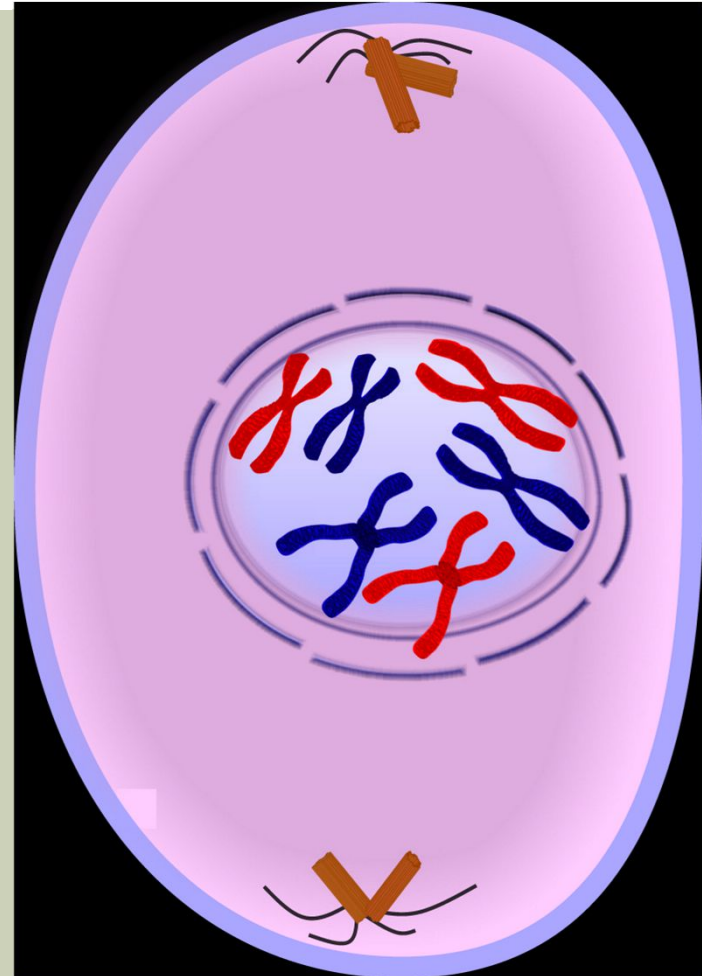


# INTERPHASE

- Grows, develops into a mature cell, duplicates its DNA
- Three stages:
  - G1
  - S
  - G2
- G1 – immediately after a cell divides
  - Growing
  - Normal cell functions
- S – copies it's DNA to prepare for cell division
  - Chromatin – uncoiled chromosomes – is visible
- G2 – cell prepares for the division of its nucleus

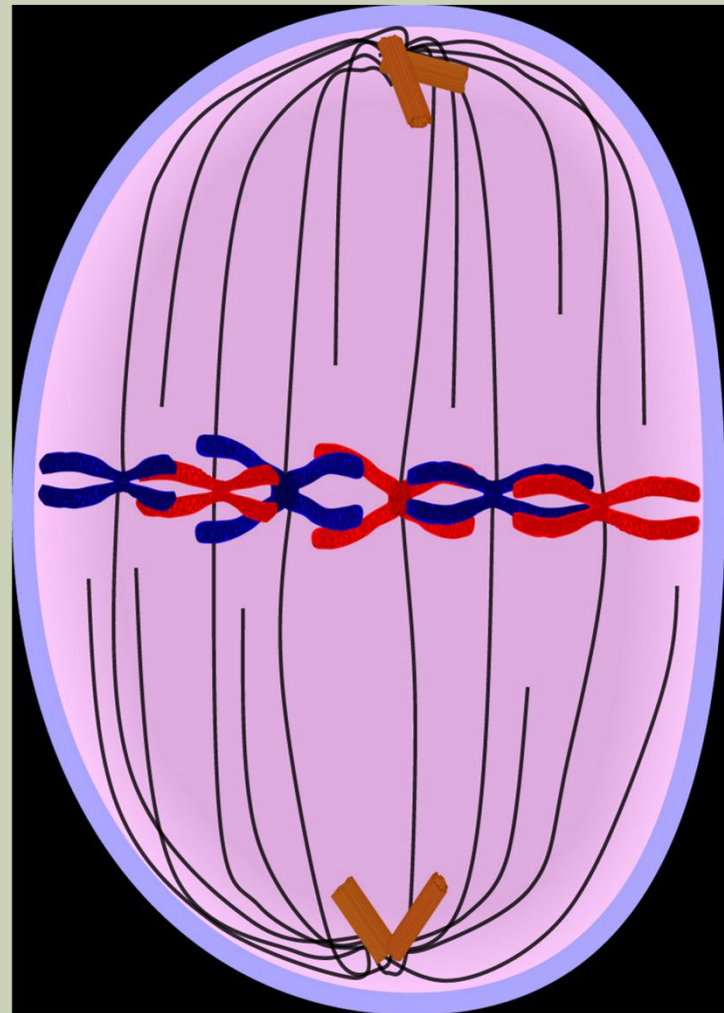
# PROPHASE

- Longest phase
- Chromatin condenses into chromosomes
- Each half of the chromosome = sister chromatid
- Nucleus disappears
- Centrioles move to the poles



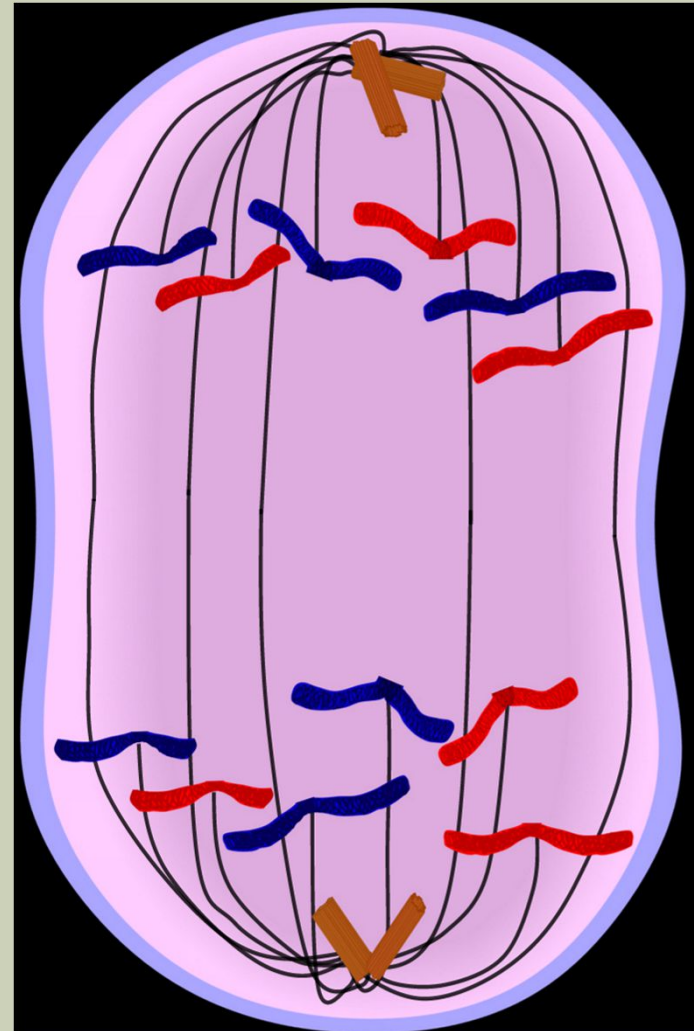
# METAPHASE

- Sister chromatids pulled towards the middle
- “meet” in the “middle”
- Shortest stage of mitosis



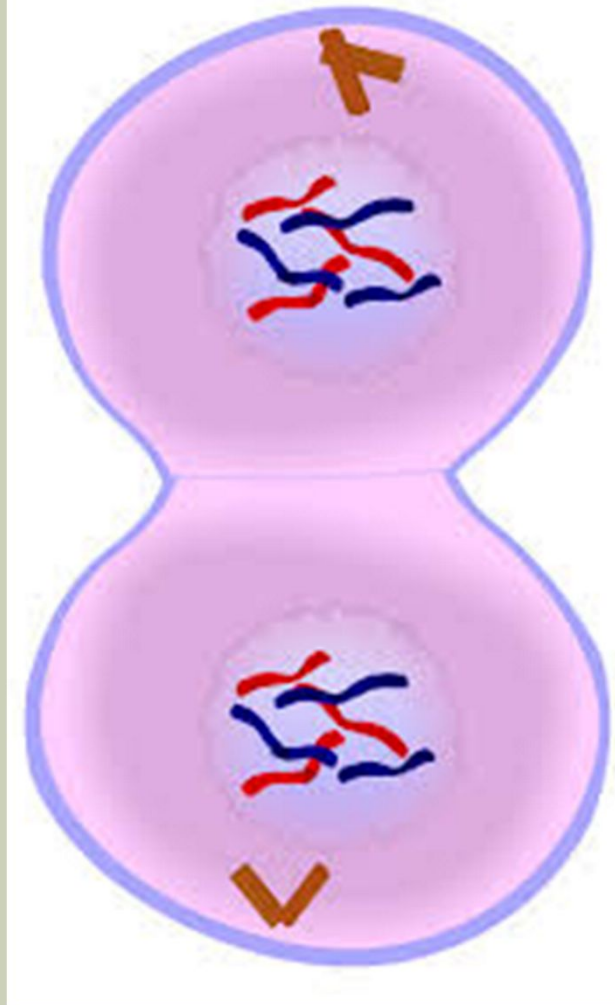
# ANAPHASE

- Chromatids pulled apart
- Microtubules shorten
- Microtubules pull the chromatids to the poles



# TELOPHASE

- Chromatids arrive at the poles
- Begin to uncondense back to chromatin
- Nuclear membranes reappear

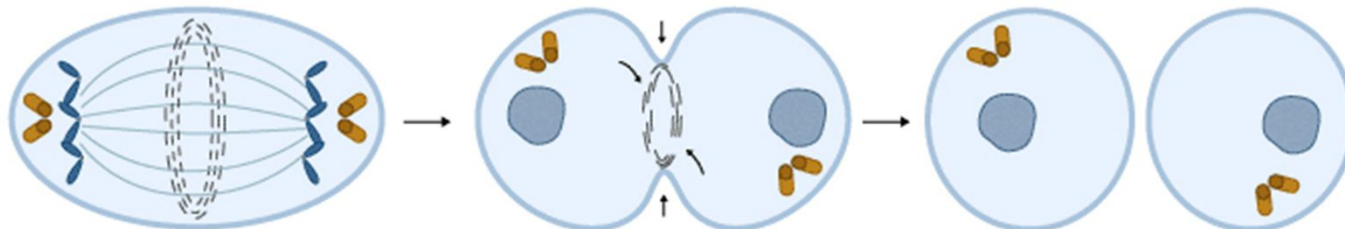


# CYTOKINESIS

- Division of the cytoplasm
- Result = two cells with identical nuclei and DNA
- Cells are pinched in half

## Telophase and Cytokinesis

### Animal Cell

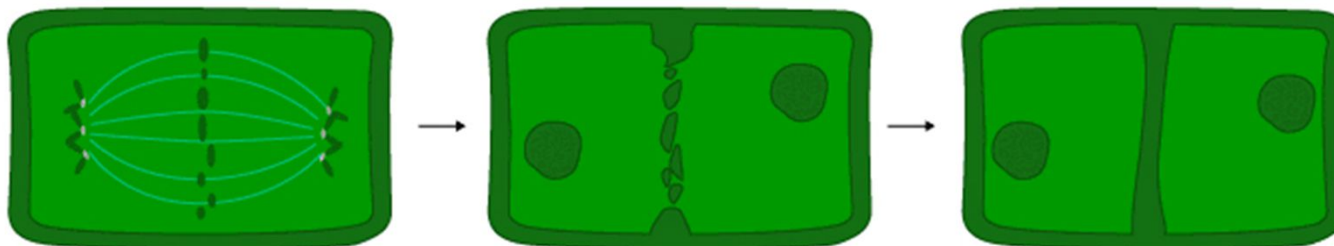


1) After anaphase, microfilaments form around center of cell.

2) Microfilaments constrict forming cleavage furrow.

3) The cell is completely pinched by the microfilaments and two cells form.

### Plant Cell



1) Following anaphase, carbohydrate rich vesicles form around center of cell.

2) Vesicles fuse and cell plate begins to form.

3) Cell plate is completely formed, creating two separate cells.