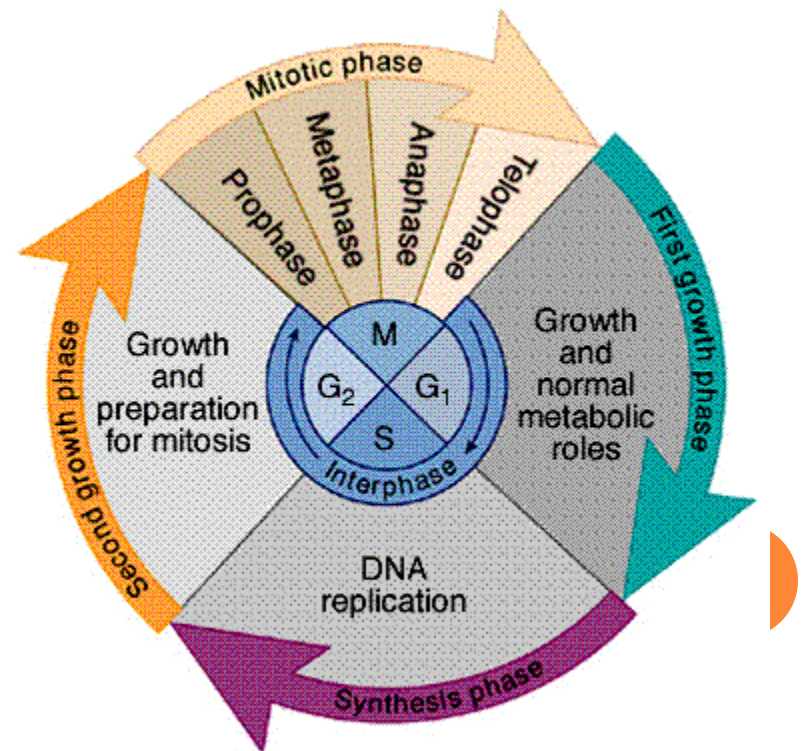
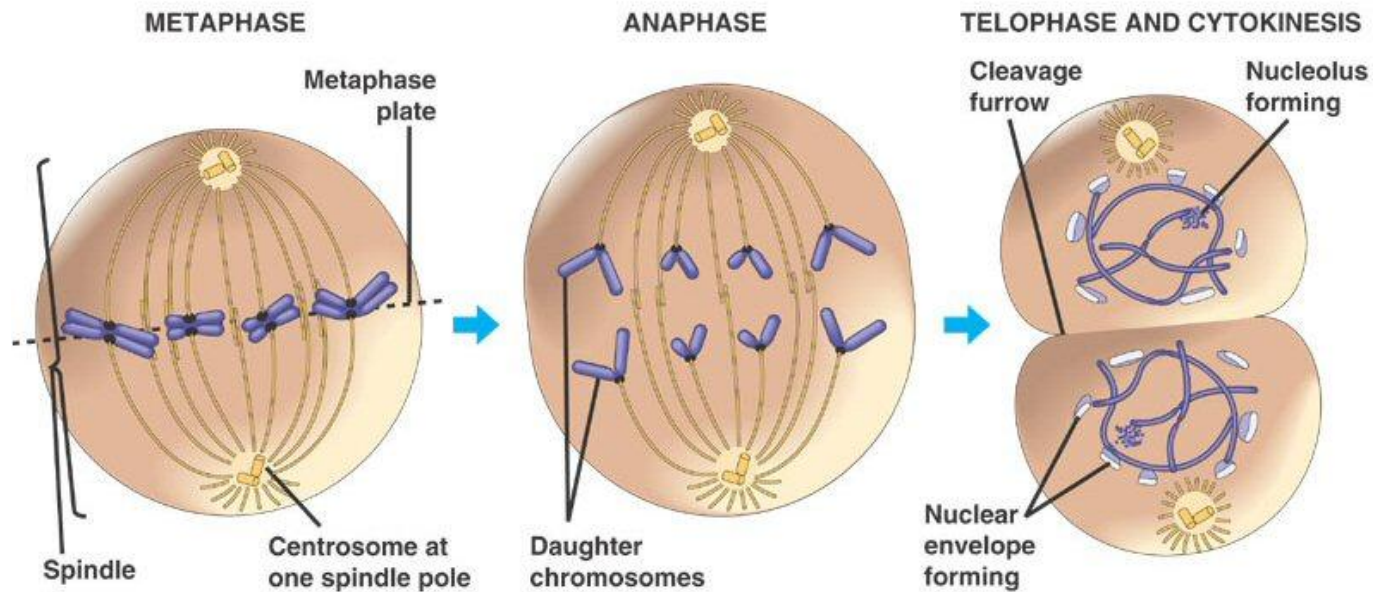
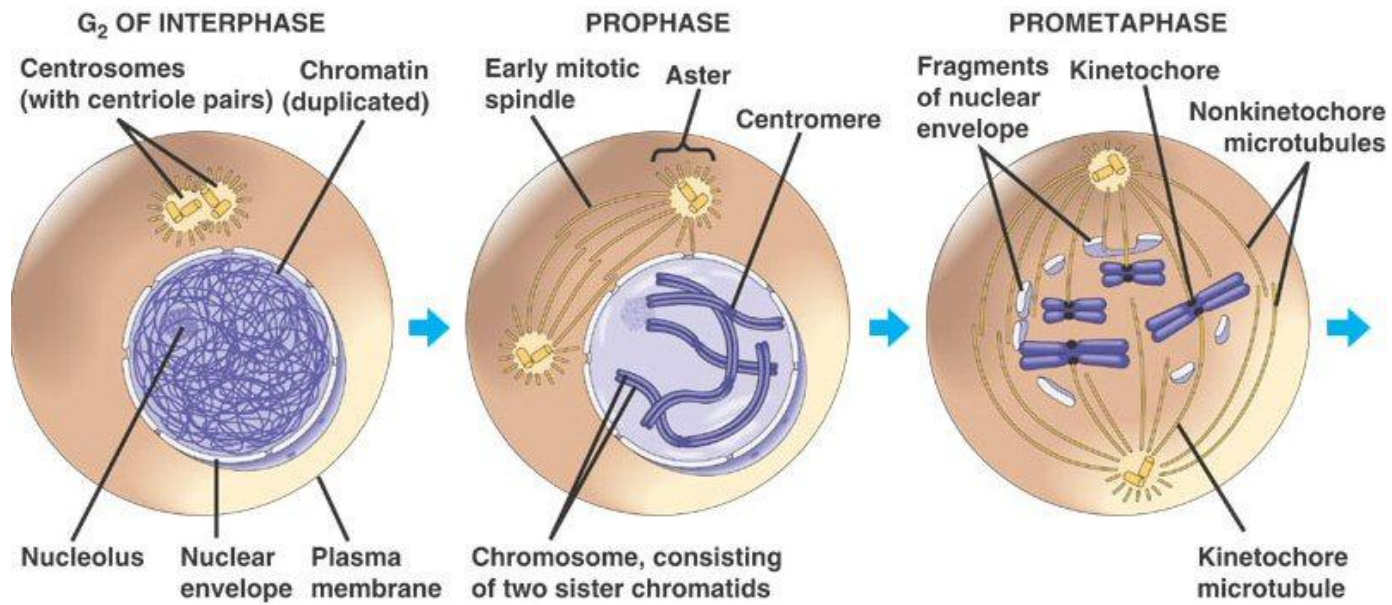


# CELL CYCLE

WHAT IS IT?????

Life cycle of the cell





# MITOSIS

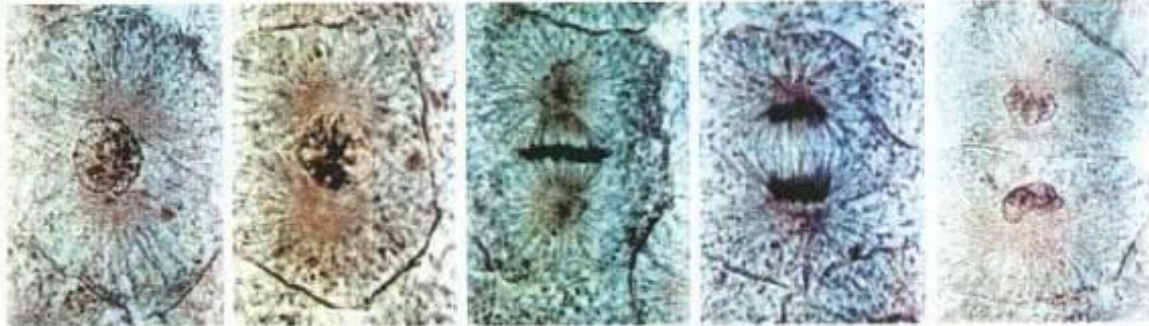
# MITOSIS IN ACTION....

For each step describe what you are seeing happen:

<http://www.youtube.com/watch?v=nPG6480RQo0>

<http://www.youtube.com/watch?v=s4PaOz7eWS8&feature=related>

Whitefish Blastula



Interphase

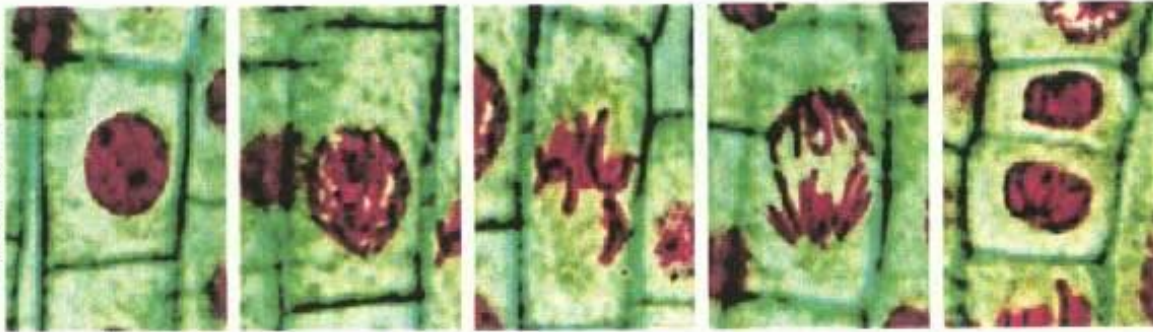
Prophase

Metaphase

Anaphase

Telophase

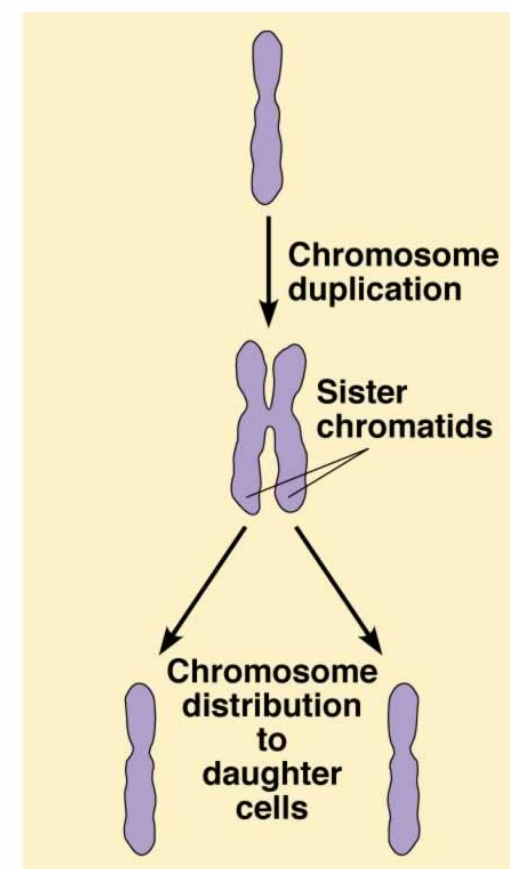
Onion Root Tip





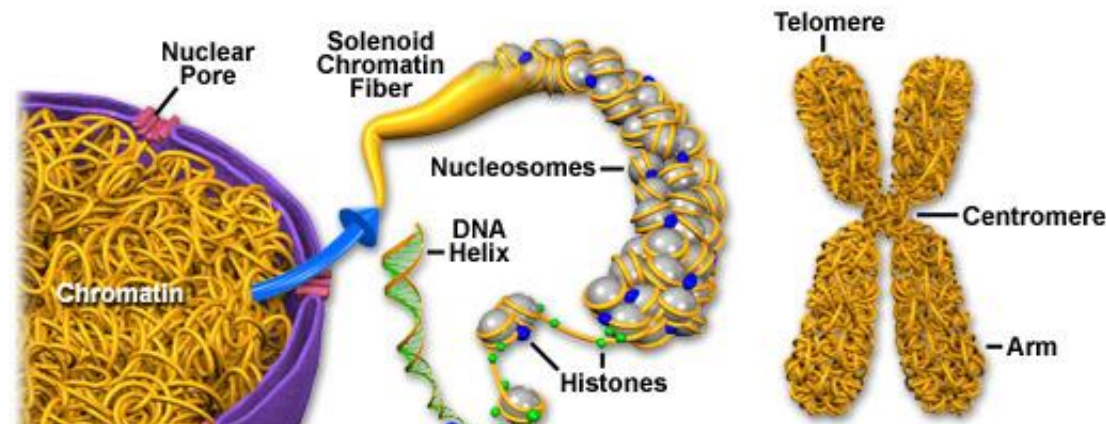
# GENETIC MATERIAL

- **Chromatin:** DNA is unwound and wrapped around histones
  - *INTERPHASE*
- **Chromosomes:** DNA is wound up
  - *MITOSIS*
- **Chromatid:** two sister chromatids makes up on chromosome- they are each side of the X and they're the copies of each other
- **Centromere:** holds the two sister chromatids together
- **Telomere:** End of the chromosome that shorten each time it is copied
- **Histones:** protein around which the DNA winds up



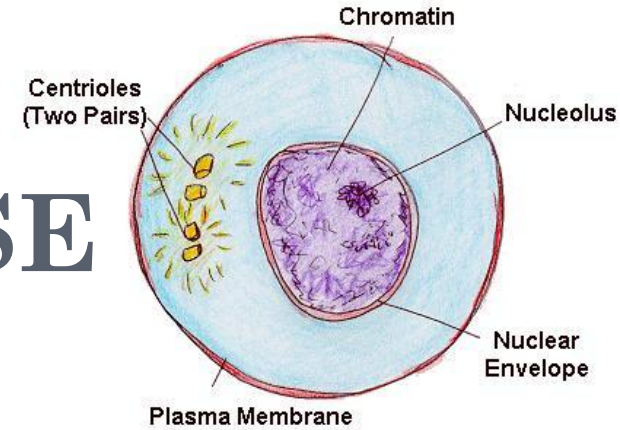
©Addison Wesley Longman, Inc.

Chromatin and Condensed Chromosome Structure

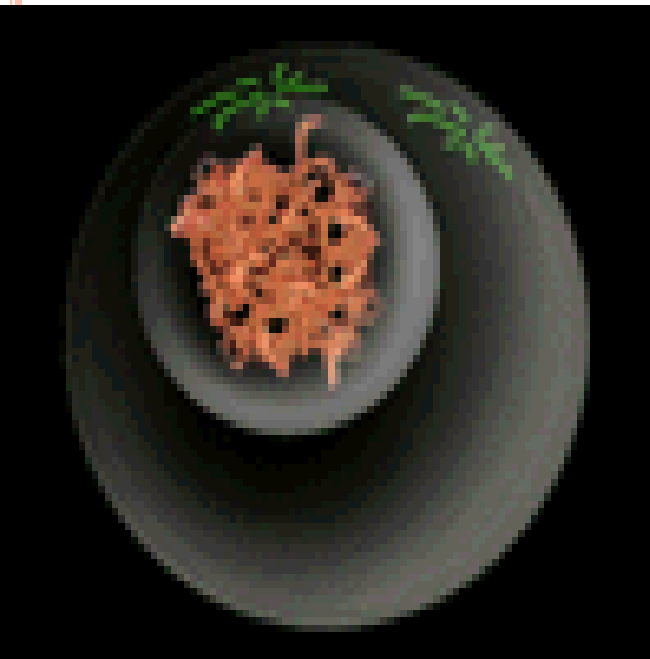




# INTERPHASE



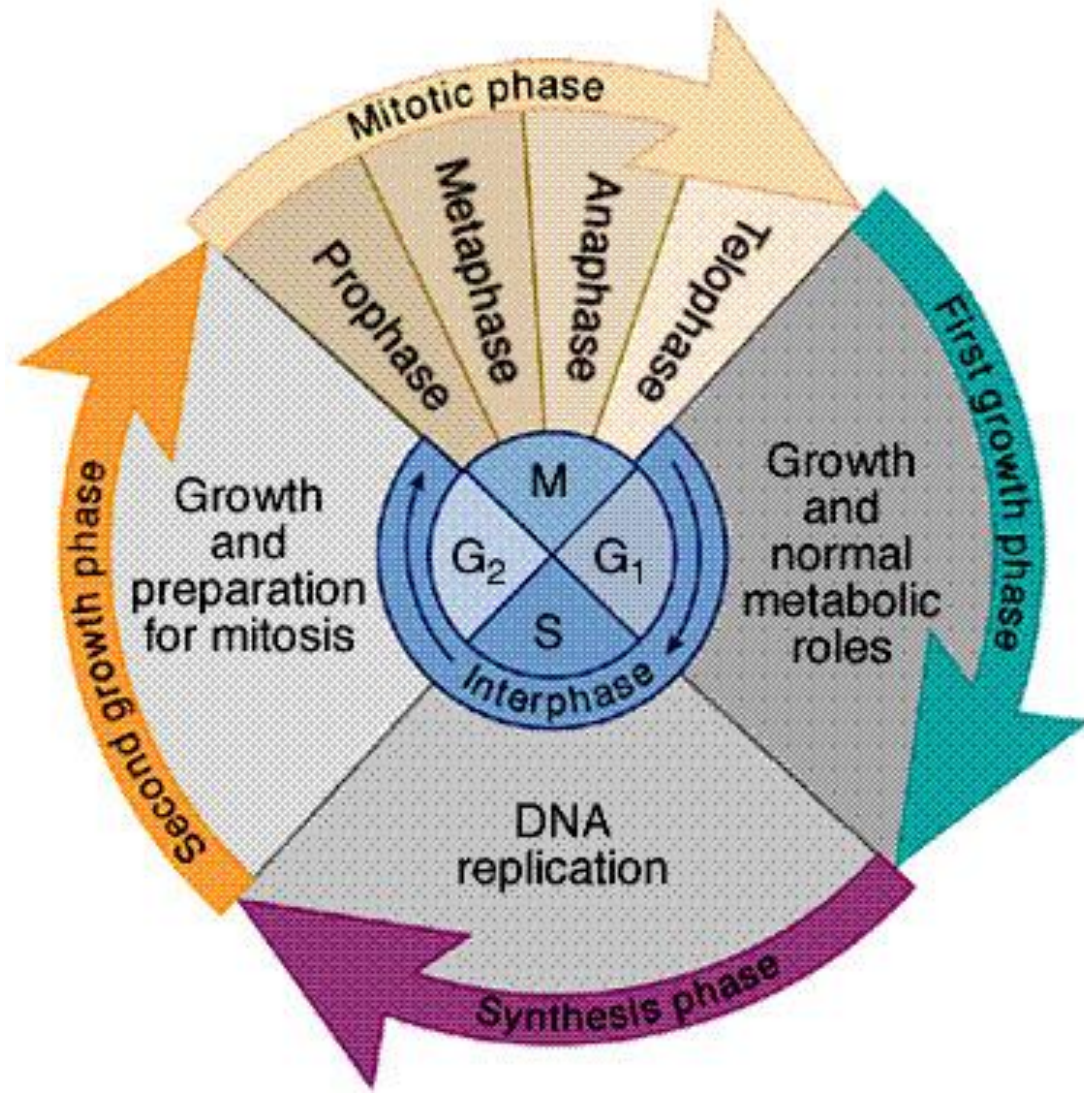
- **Consists of G1, S, G2 phases**
- **Cell spends most of its time in this phase.**
- **LONGEST phase of CELL CYCLE**
- **NOT A PART OF MITOSIS**
- **Chromosomes are unwound**
- **Nucleolus visible**



# INTERPHASE

## Gap 1 Phase

- Growth Phase
- Organelles increase in number

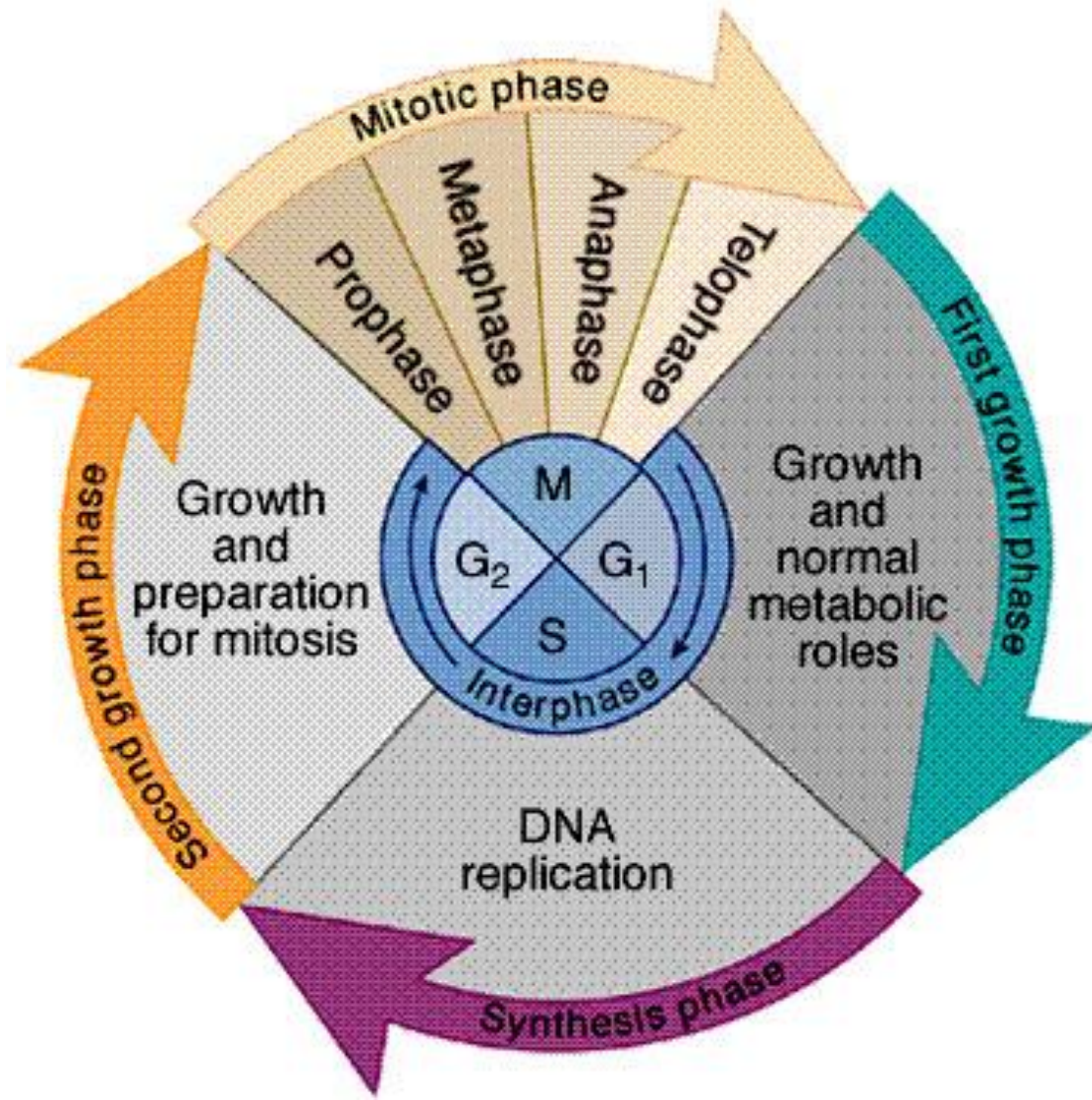




# INTERPHASE

## S-phase

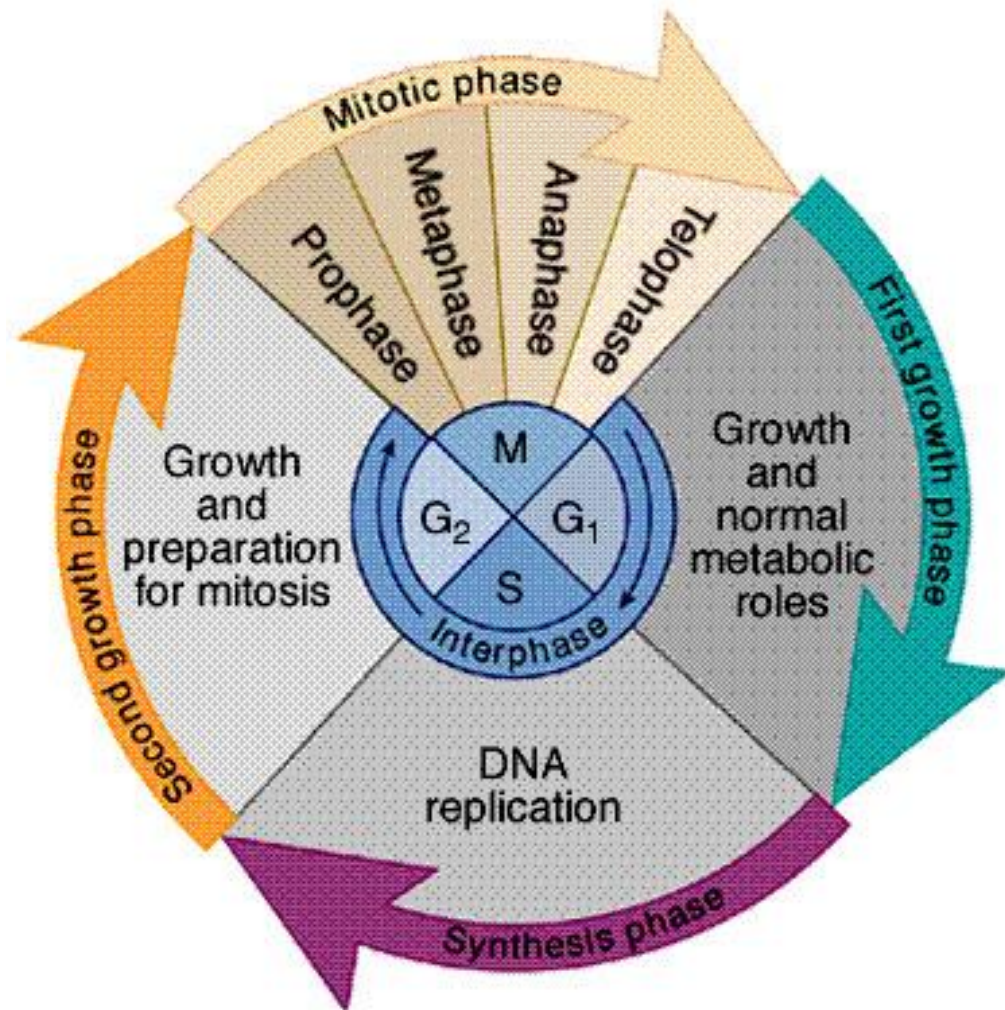
- Synthesis phase
- DNA replication occurs



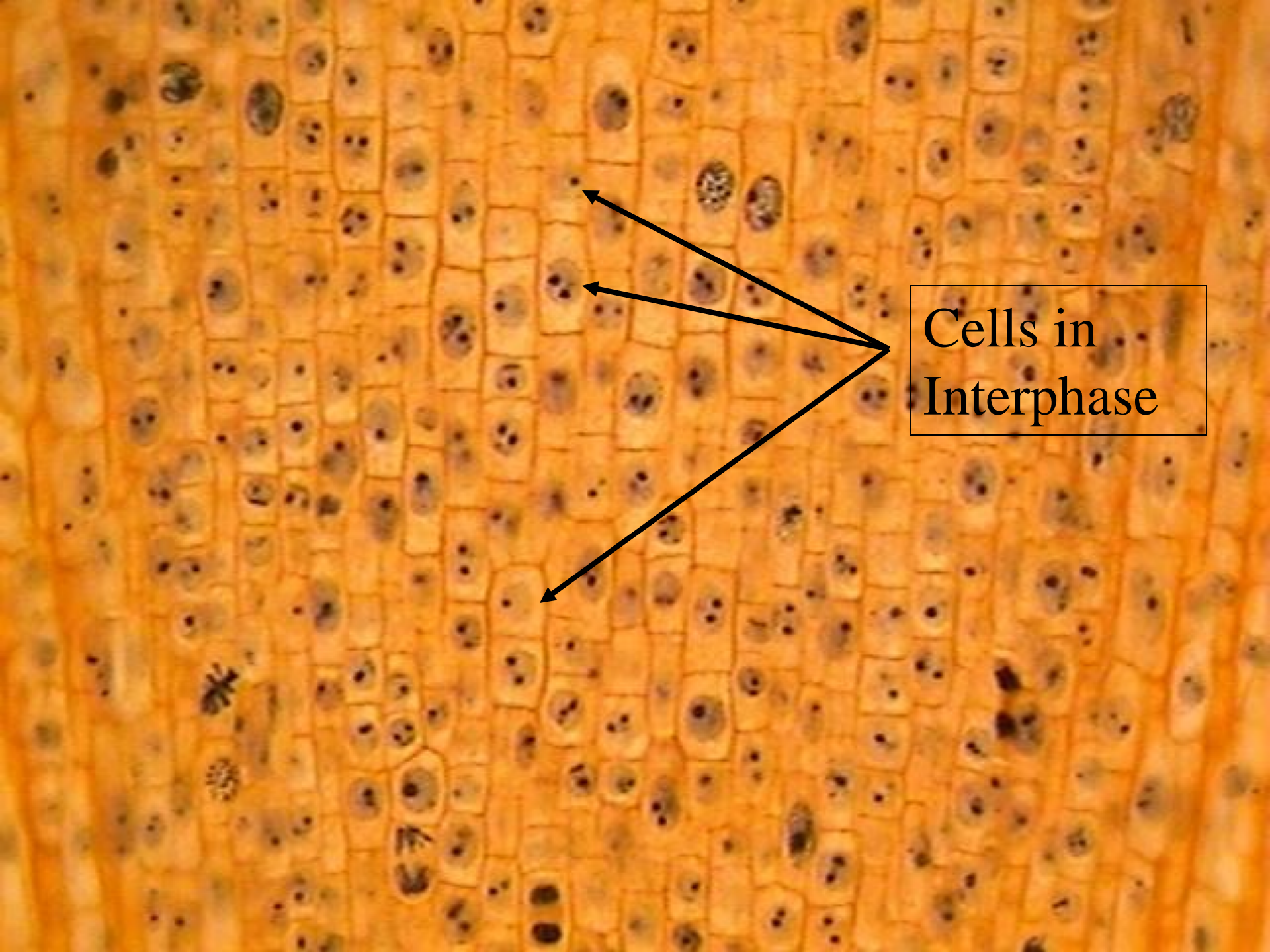
# INTERPHASE

## Gap 2 (G<sub>2</sub>) phase

- More growth occurs and cell prepares for division
- Centrioles form



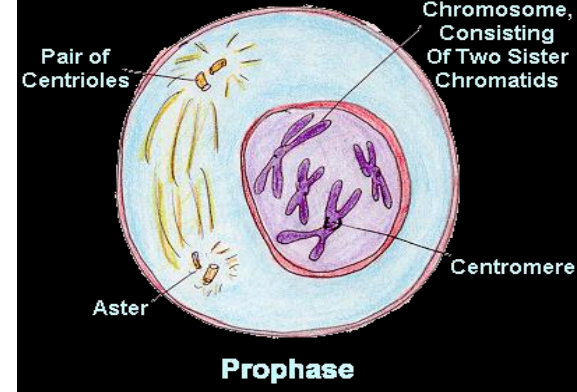




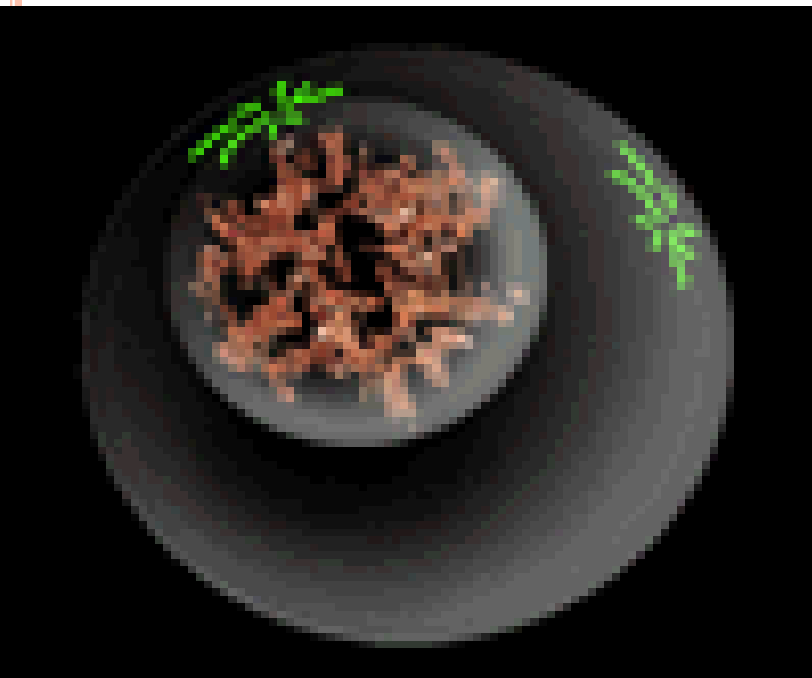
Cells in  
Interphase



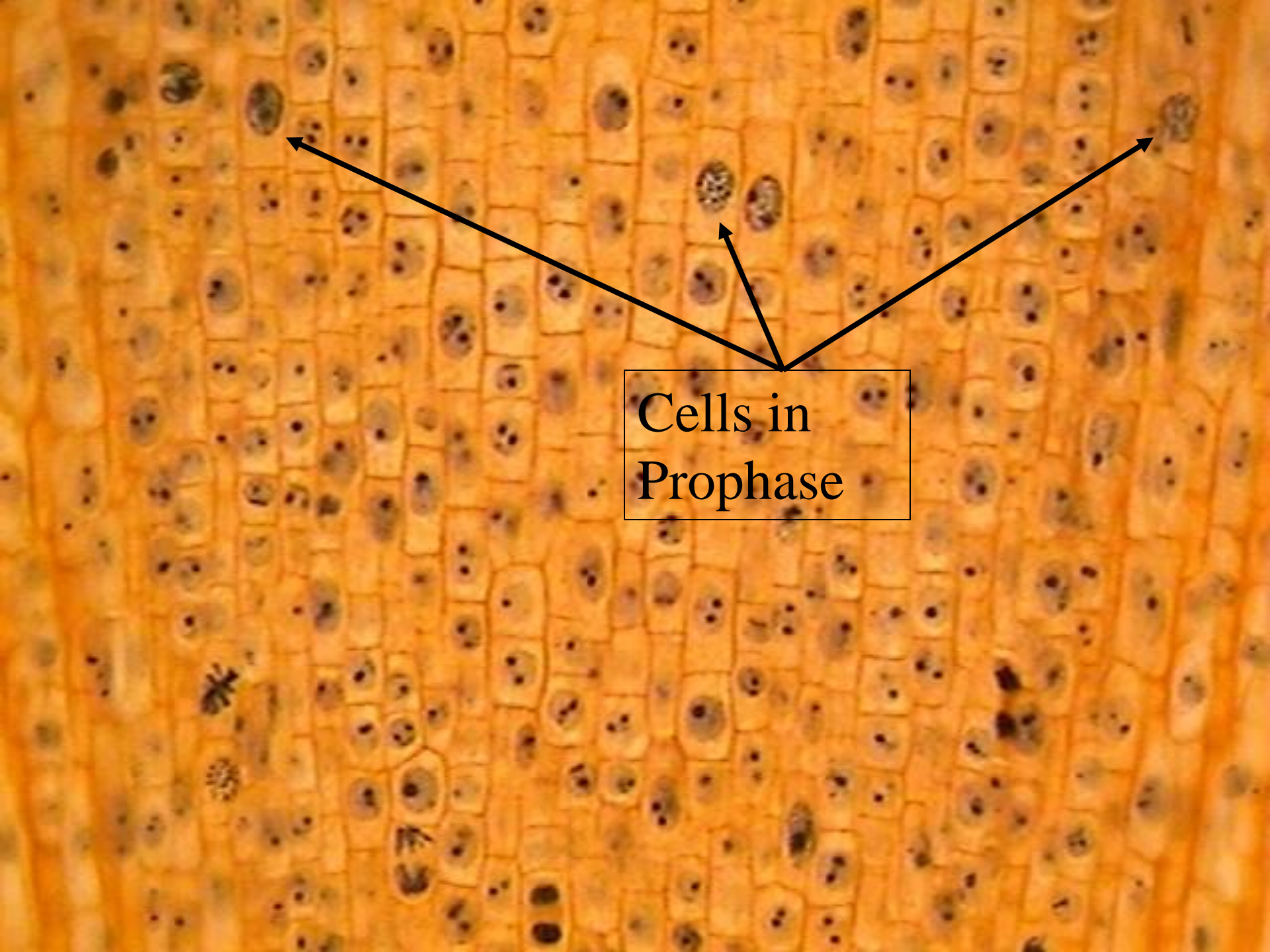
# PROPHASE



- Chromosomes condense
- Nuclear membrane **starts** to disappear
- Centrioles move to opposite ends (only animal cell)
- Spindle fibers are formed by centrioles or centrosomes  
Nucleolus disappears
- Longest phase of mitosis

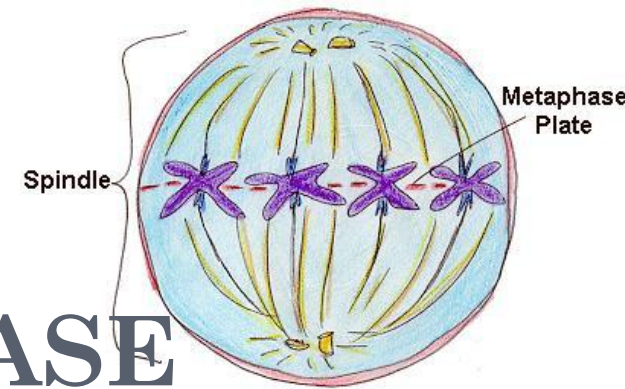






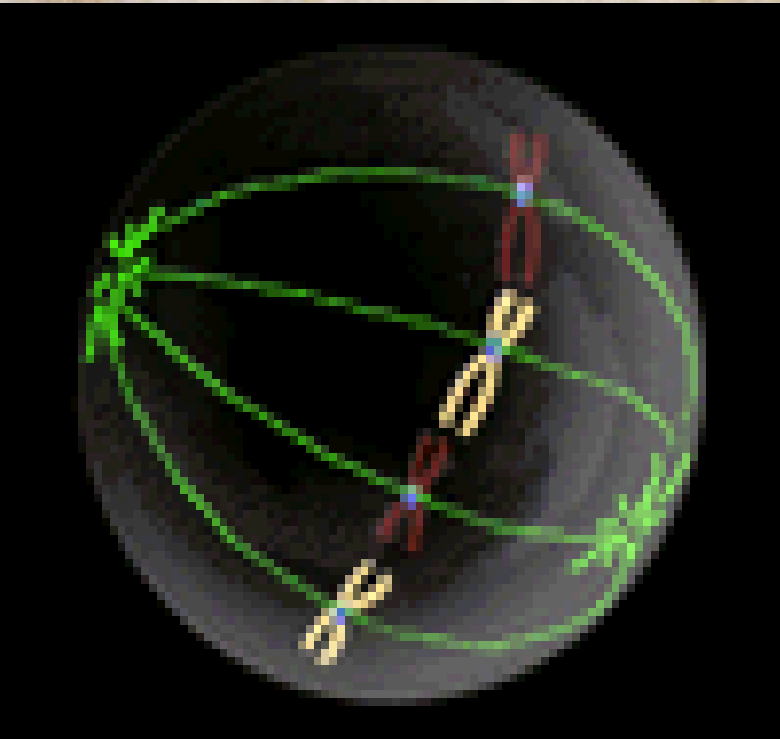
Cells in  
Prophase





# METAPHASE

- Chromosomes line up at equator/middle
- Spindles connect to middle of chromosome/centromere
- Centrioles grow further apart
- Nucleus/nuclear membrane breaks down



Cells in  
Metaphase

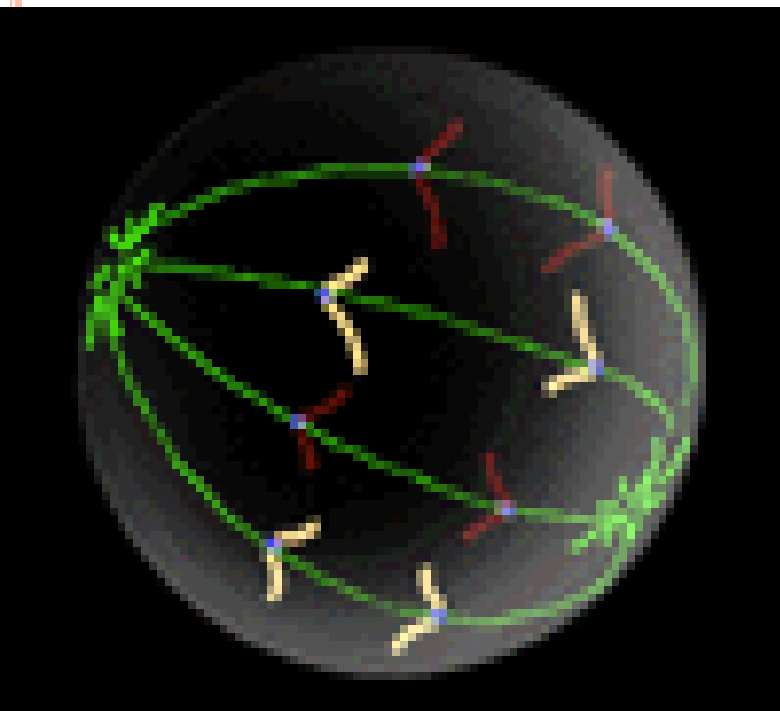




# ANAPHASE



- Chromosomes split
- Spindle fibers pull chromosomes apart
- Sister chromatids move to opposite sides

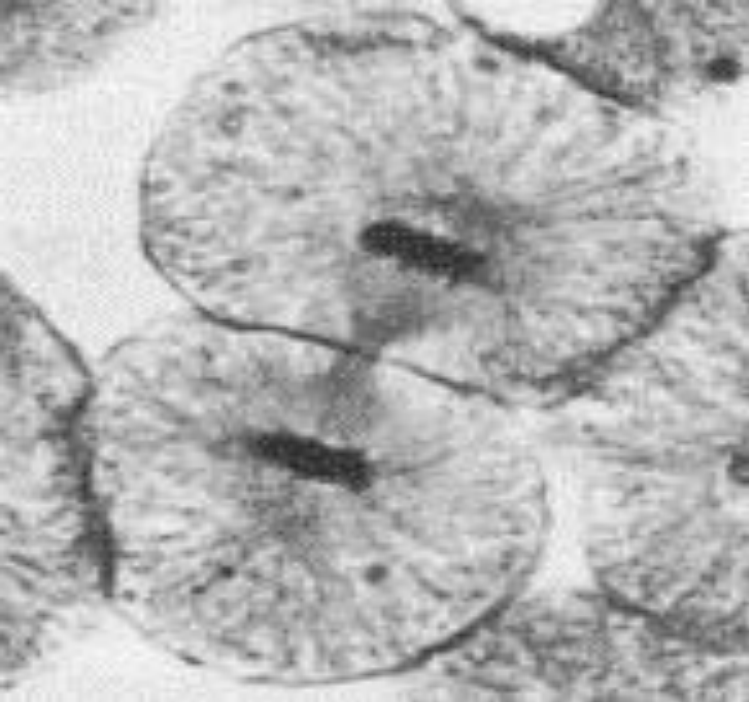




A light micrograph of a plant tissue section, likely an onion root tip, showing several rows of rectangular cells. The cells are stained, and their nuclei are visible. Some cells show chromosomes in various stages of division. A black box with the text "Cells in Anaphase" is centered in the image, with a black arrow pointing to a cell on the right side of the box that is in the anaphase stage of mitosis. The cell's chromosomes are clearly visible as dark, V-shaped structures moving apart.

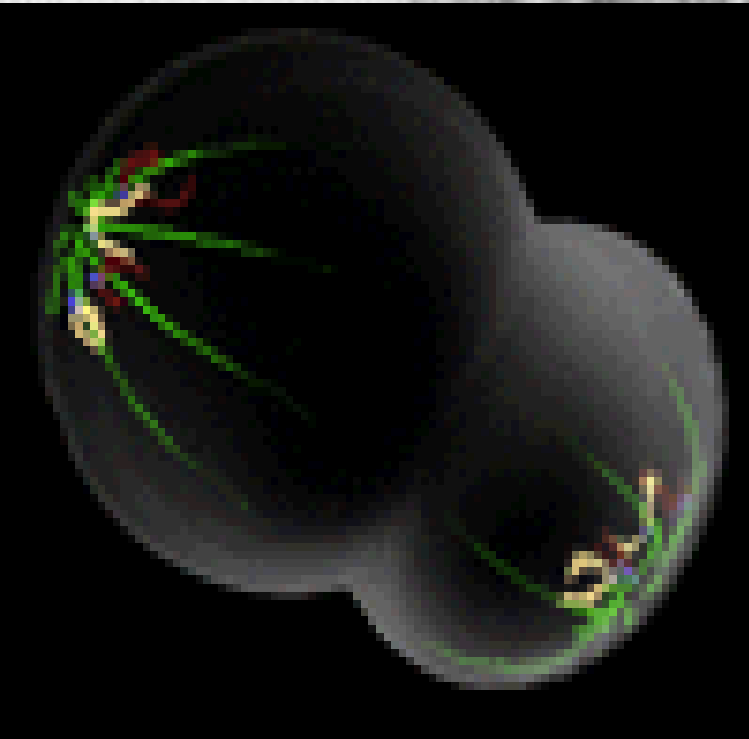
Cells in  
Anaphase





# TELOPHASE

- Membrane begins to pinch in (forming two separate cells)
- Nuclear membrane reforms
- Nucleolus reforms
- Chromosomes uncoil into chromatin
- Spindle fibers break apart





Cells in  
Telophase



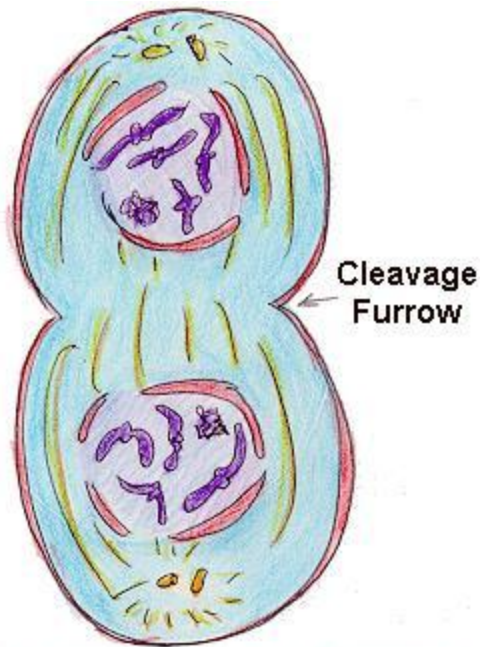


# CYTOKINESIS

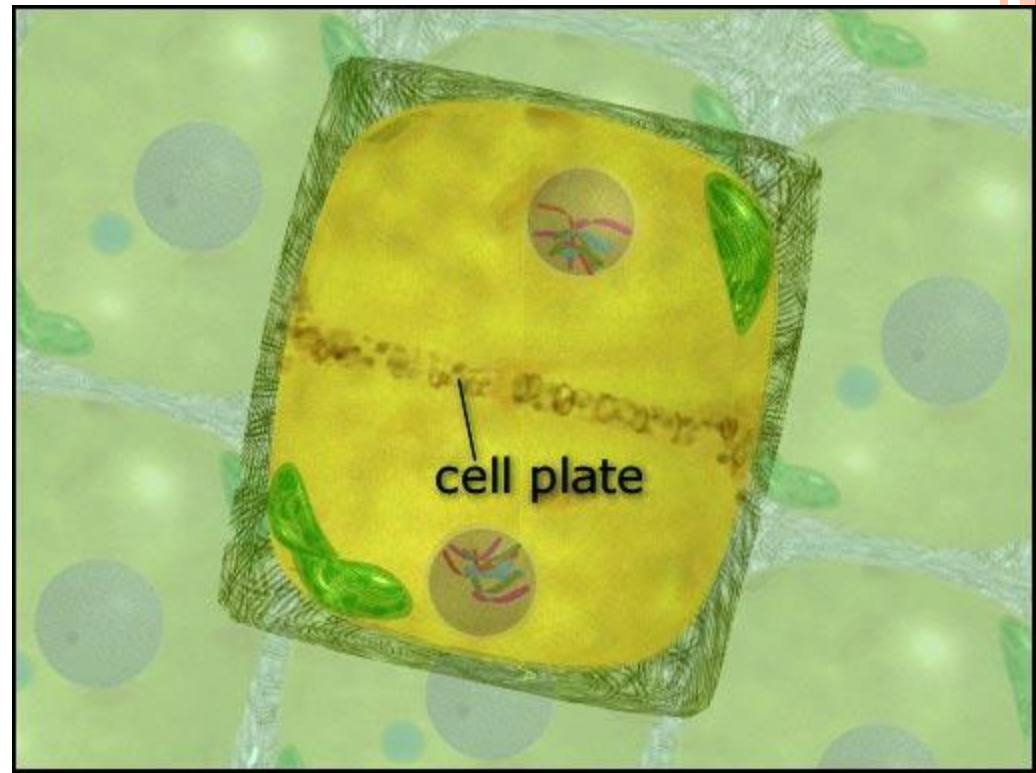
PART OF M- PHASE BUT AFTER MITOSIS

CYTOKINESIS – Pinch off cytoplasm to form 2 new cells

NOTE: DIFFERENT FOR PLANTS- FORM A CELL PLATE!!!!



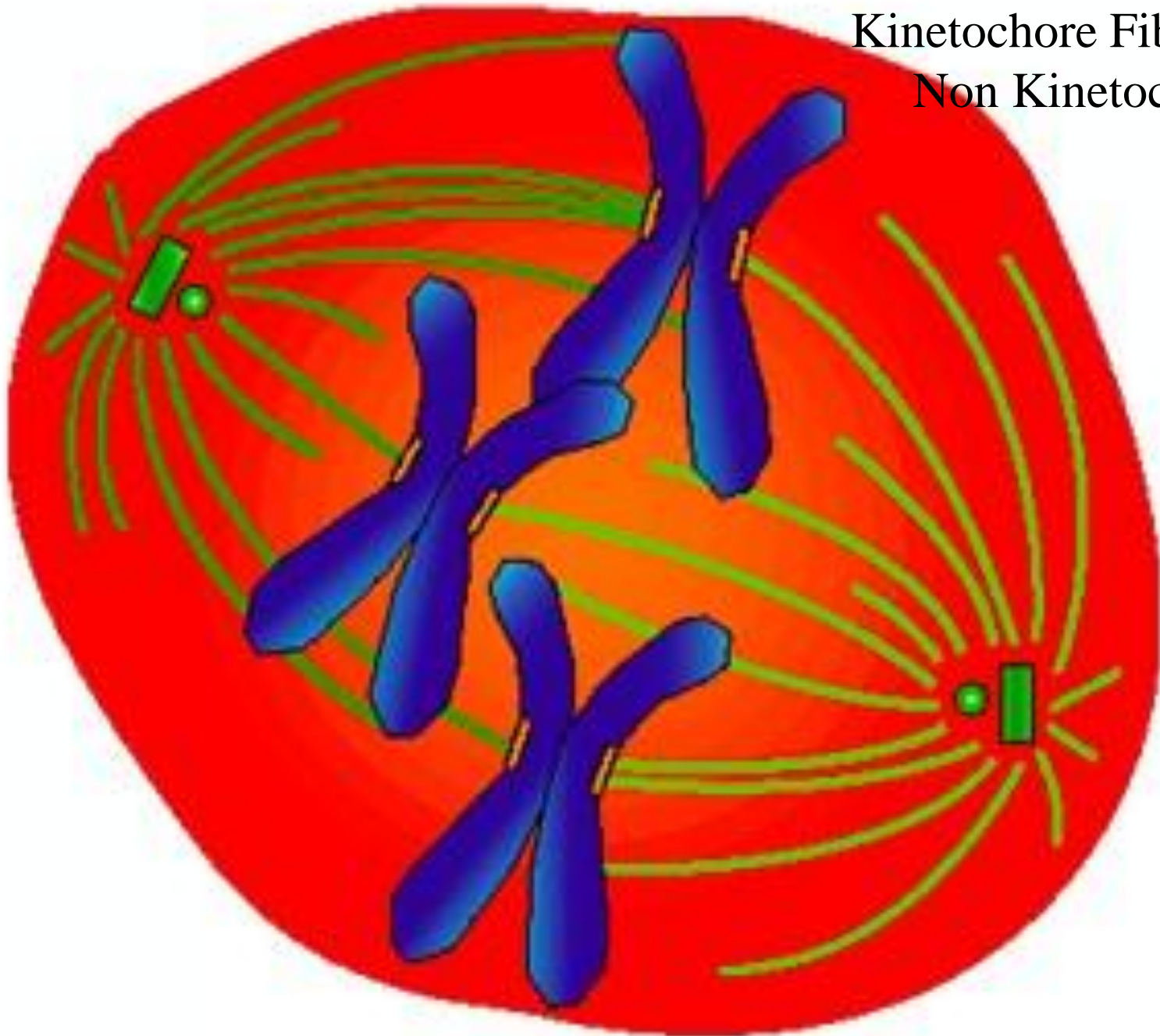
**Telophase and Cytokinesis**



Spindle Fibers

Kinetochores Fibers

Non Kinetochores Fibers





# YOU TUBE

Mitosis in review:

<http://www.youtube.com/watch?v=VIN7K1-9QB0&feature=related>

Synchronized Swimming Example:

<http://www.youtube.com/watch?v=eFuCE22agyM>

