

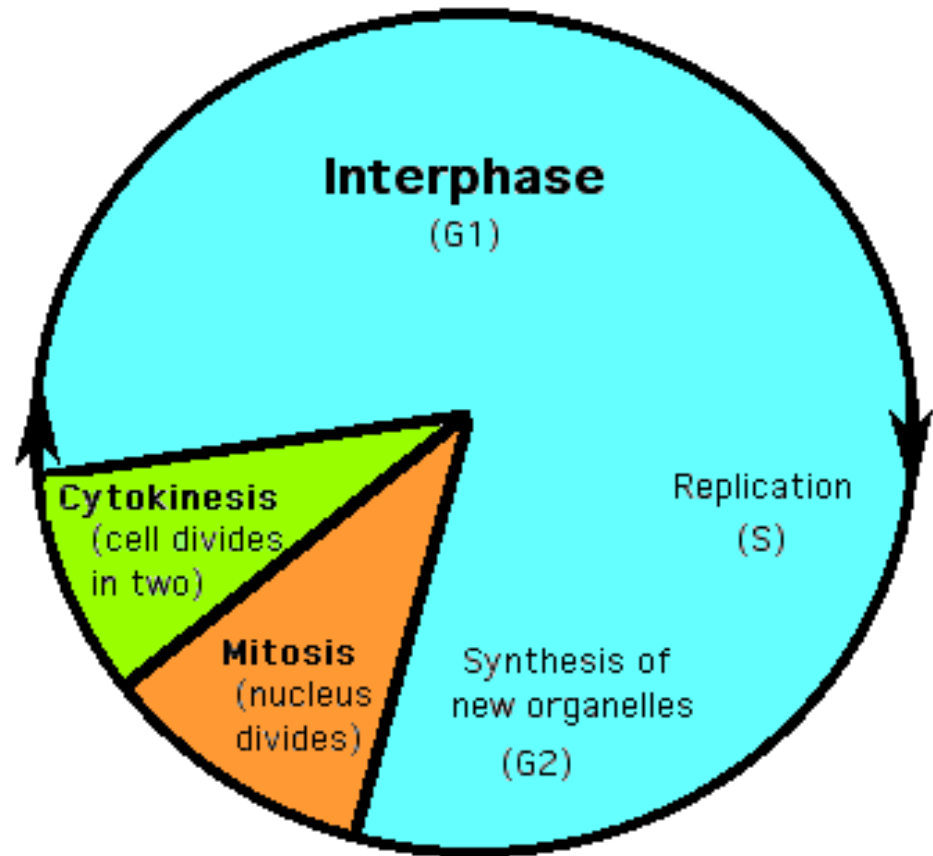
[Learning Objectives]

- To recognize the stages and phases of the cell cycle
- Investigate mitosis using inquiry skills
- Describe the cell cycle in animals, and explain the importance of mitosis for the growth of cells and repair of tissues

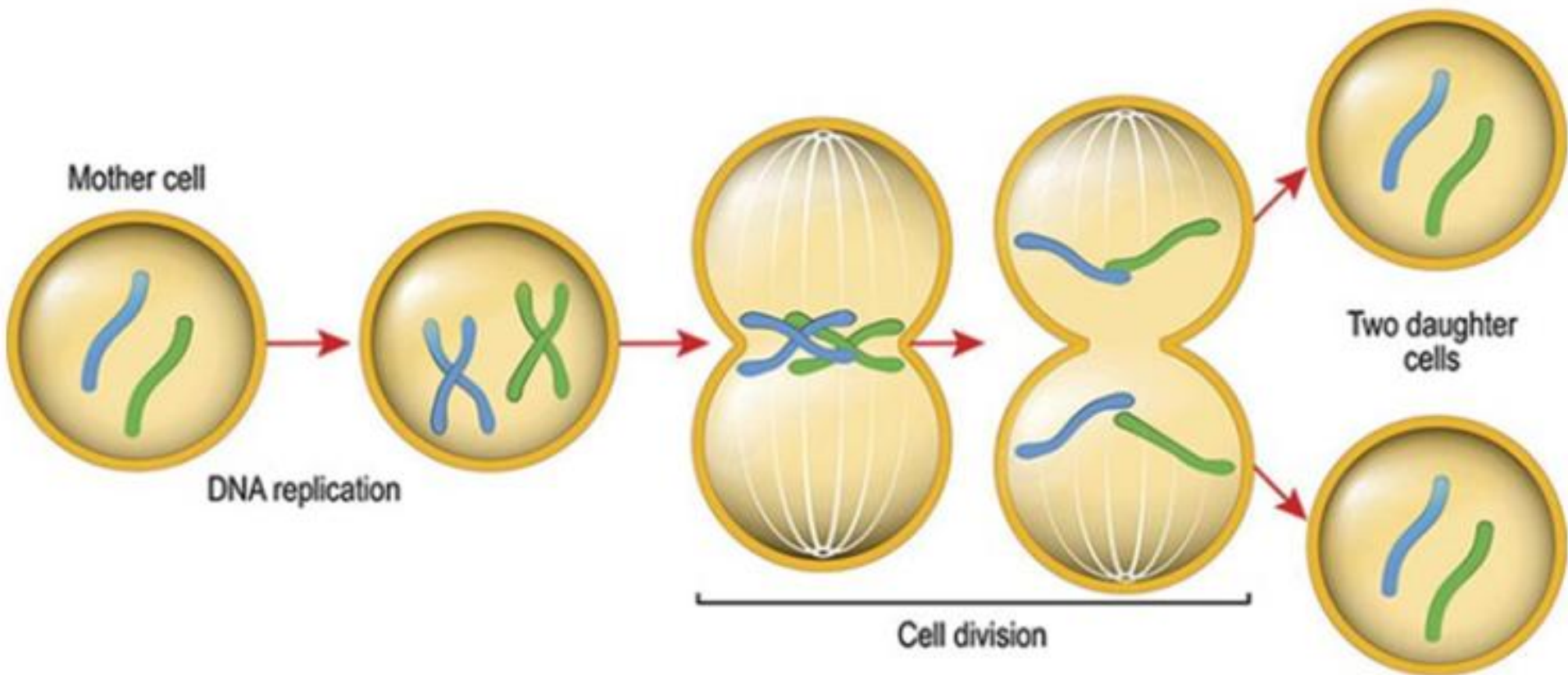
[Cell Cycle: Mitosis]

3 stages:

- Interphase
- Mitosis
- Cytokinesis



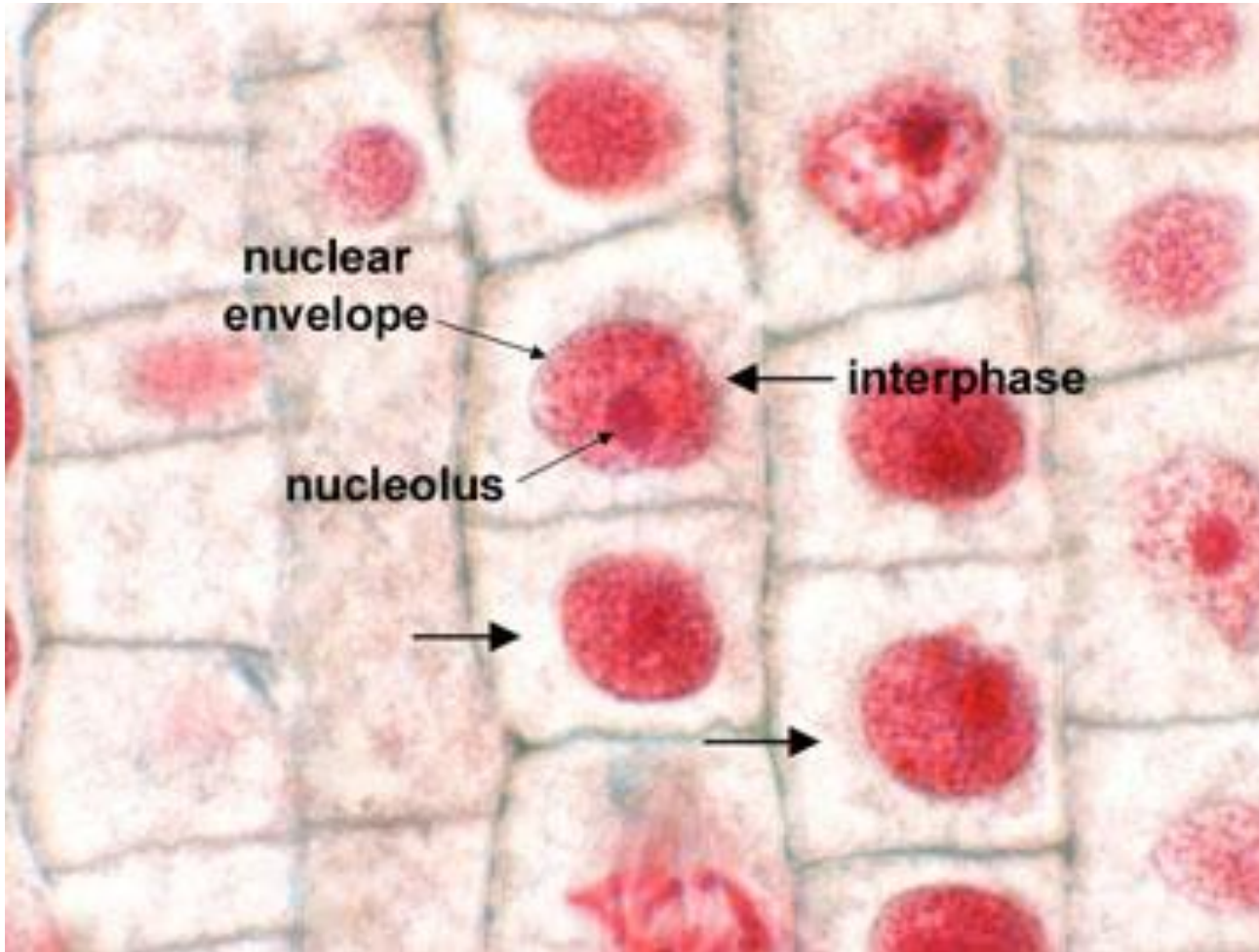
[Cell Division: What exactly happens here?]



[Interphase]

- Longest stage
- Cell is busy with all life activities (building proteins, extracting energy, duplicating organelles and DNA)
- Chromosomes in long, thin, invisible strands

[Interphase]



[Cell Division - Mitosis]

- The division of the genetic material
- Results in two genetically identical daughter cells
- Four phases – PMAT (acronym)

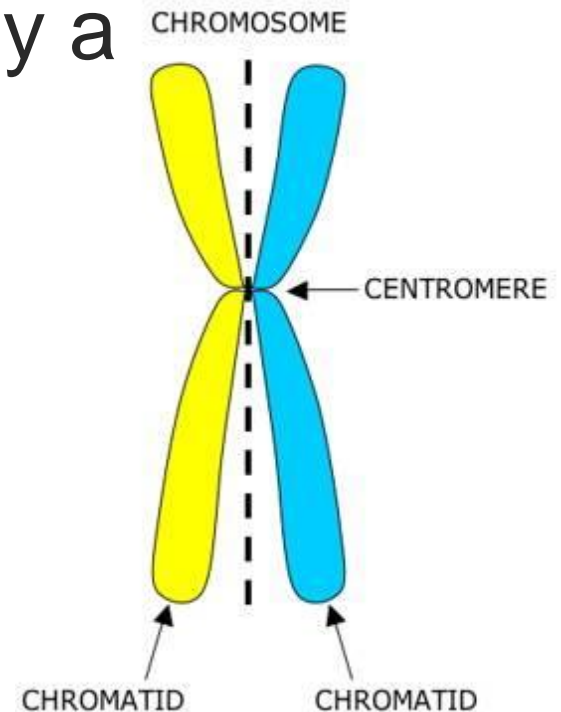
[Make a table:

]

Phases of Mitosis	Events
Prophase	
Metaphase	
Anaphase	
Telophase	

[Prophase]

- Chromosomes shorten and thicken,
- Each chromosome made up of sister chromatids held together by a centromere
- Nuclear membrane breaks down

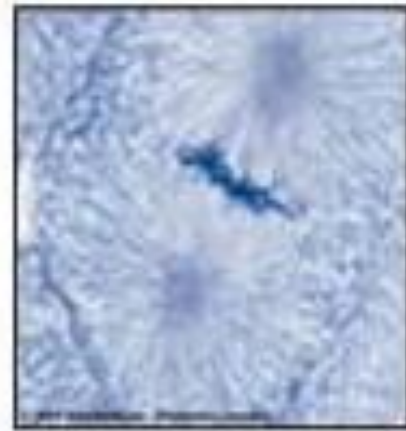
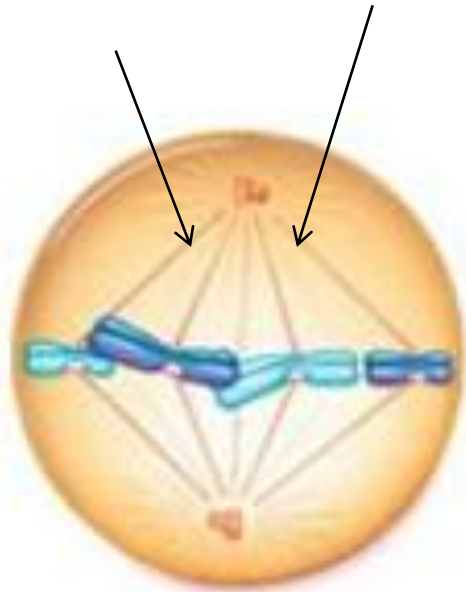


[Prophase]



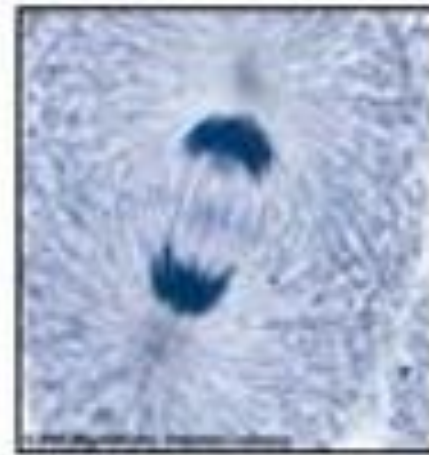
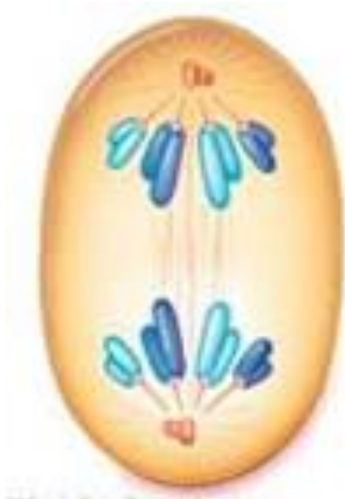
[Metaphase]

- Chromosomes line up along the middle of the cell (the equator)
- Spindle fibres are visible



[Anaphase]

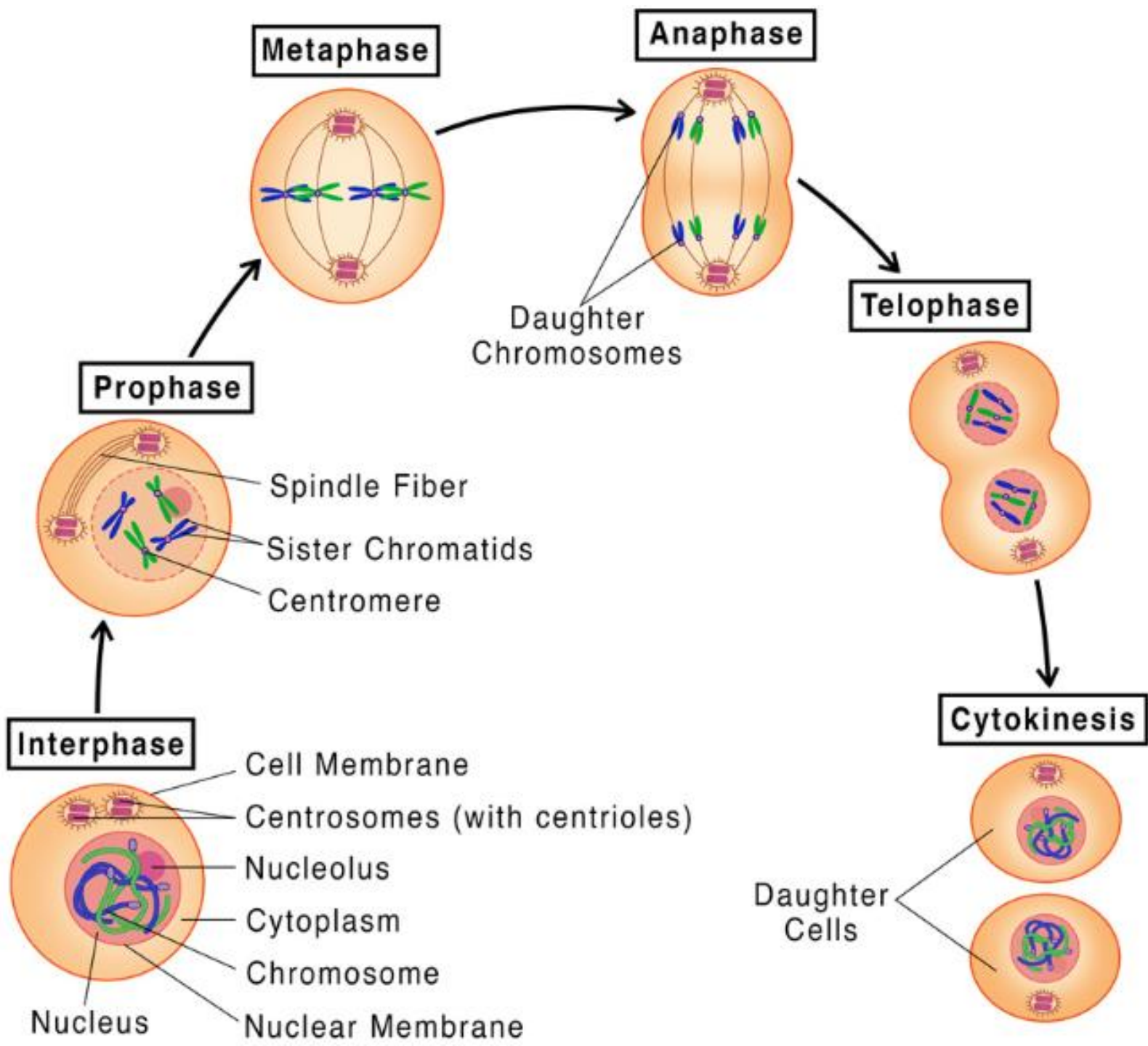
- Centromere splits and each chromatid, now called a daughter chromosome, migrates towards opposite poles, pulled by the spindle fibres

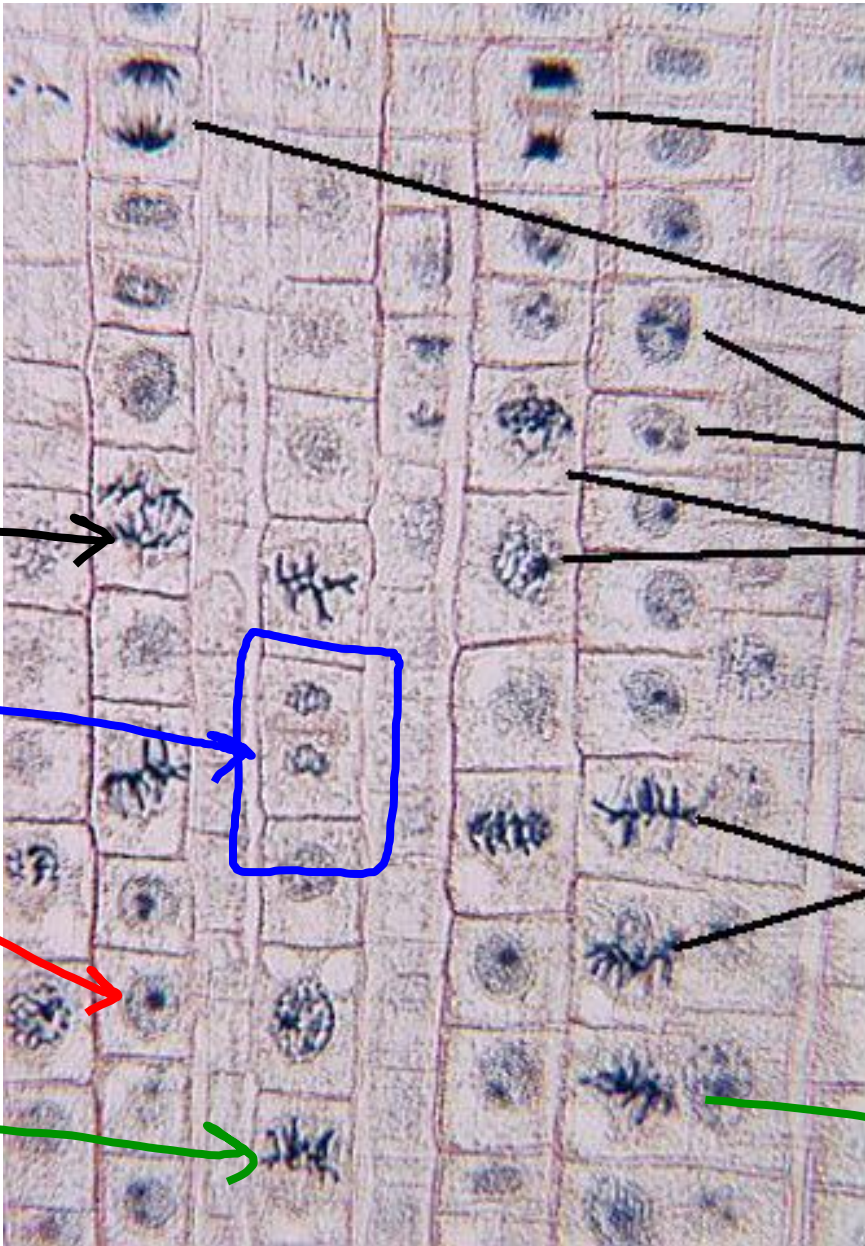


[Telophase]

- Chromosomes thin and lengthen, and so are no longer visible under light microscope
- Nuclear membrane forms







Telophase

Anaphase

Interphase

Prophase

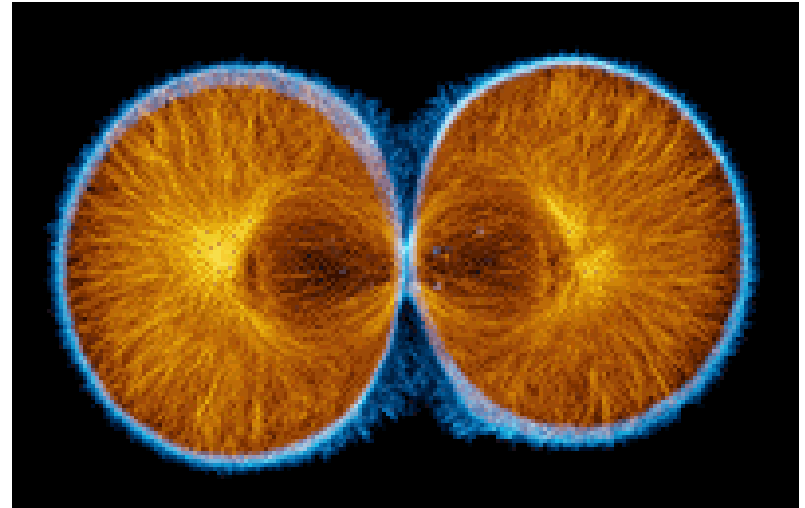
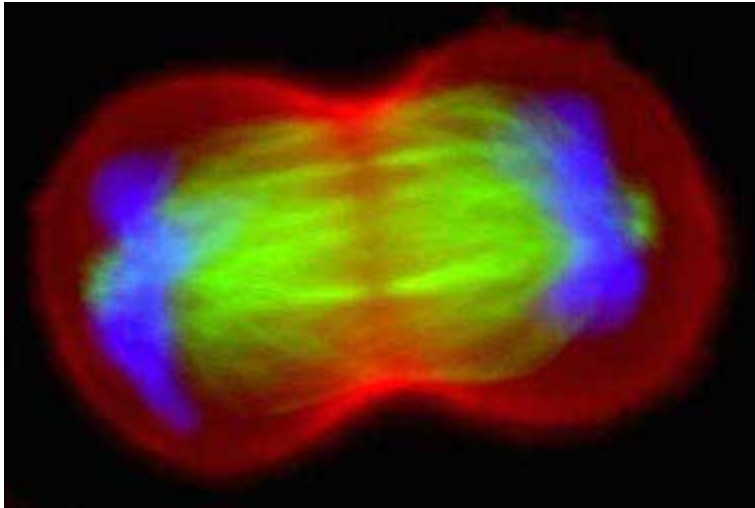
Metaphase



[Cytokinesis]

- Cytoplasm divides, producing two daughter cells
- In animal cells, cytoplasm pinches apart
- In plant cells, a cell plate forms

[Cytokinesis in Animal Cells]



[Cytokinesis in Plant Cells]



Checkpoints in the Cell Cycle

- Specialized proteins keep the nucleus informed as to the status of the cell and its environment
- The nucleus then instructs the cell:
To divide or not to divide

[Cells remain in interphase if:]

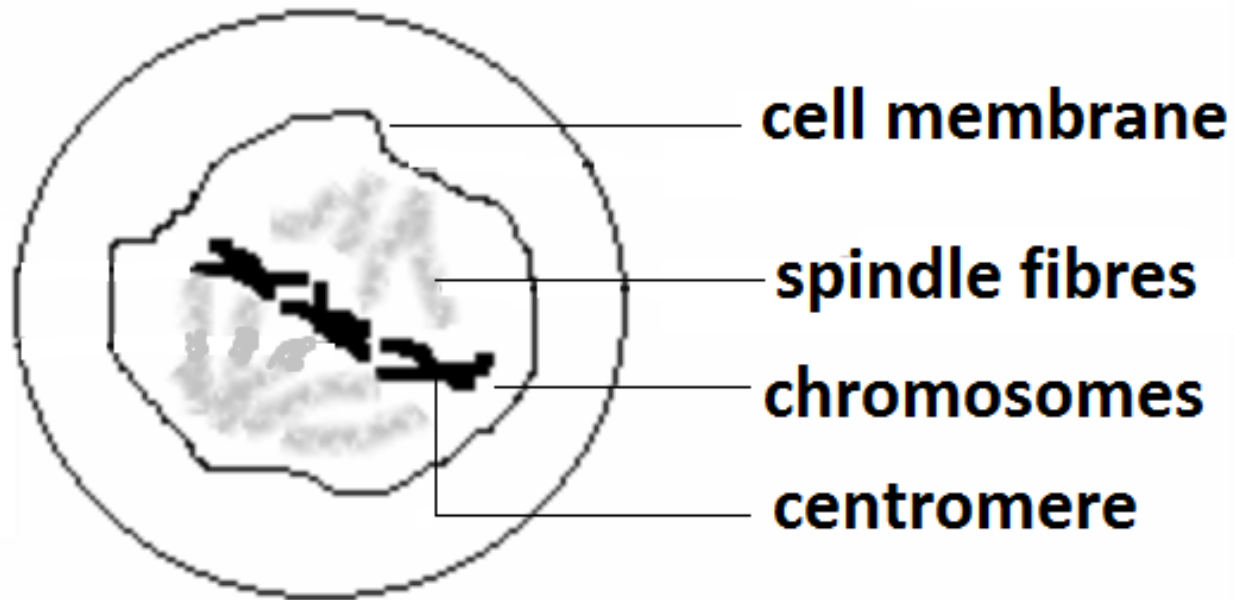
- Signals from surrounding cells say no
- Nutrients are in short supply
- DNA has not been replicated
- DNA is damaged

Observing Cell Division: Pipe Cleaner Activity

- Groups of 3
- Observe and draw interphase, the four stages of mitosis, and cytokinesis (for a total of 6 drawings, in order)
- Answer questions pg.44 #1 - 7

Biological Drawings

Mitosis in Whitefish cells



Metaphase

400 X

