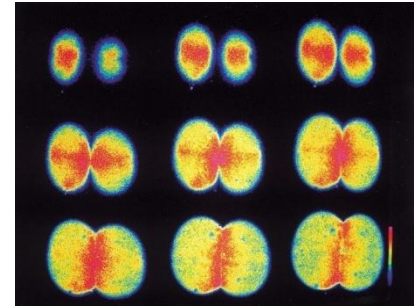
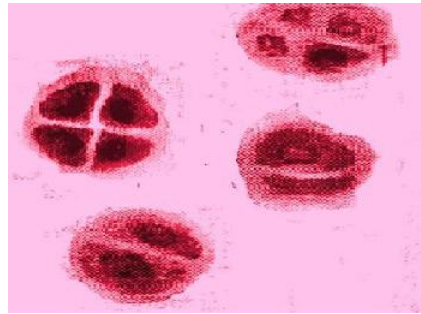
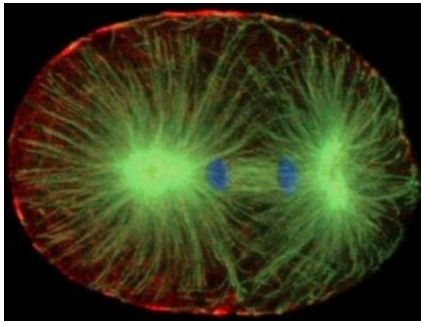
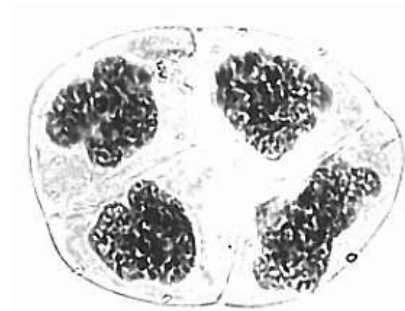
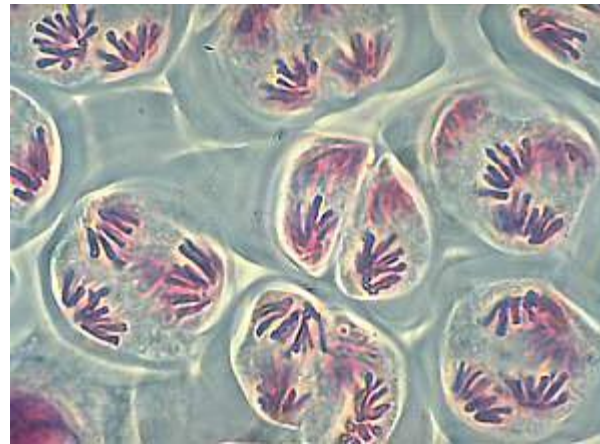
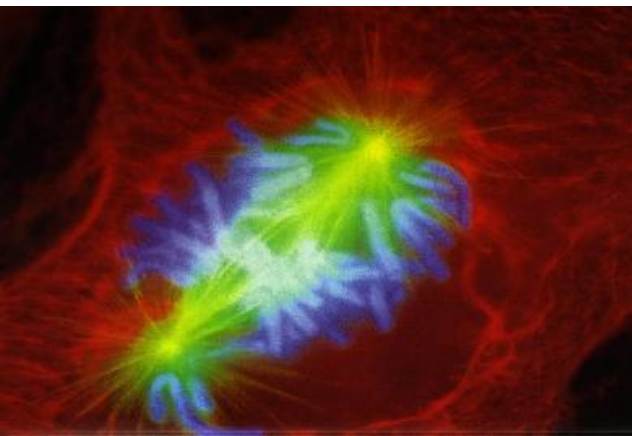


Cell Division



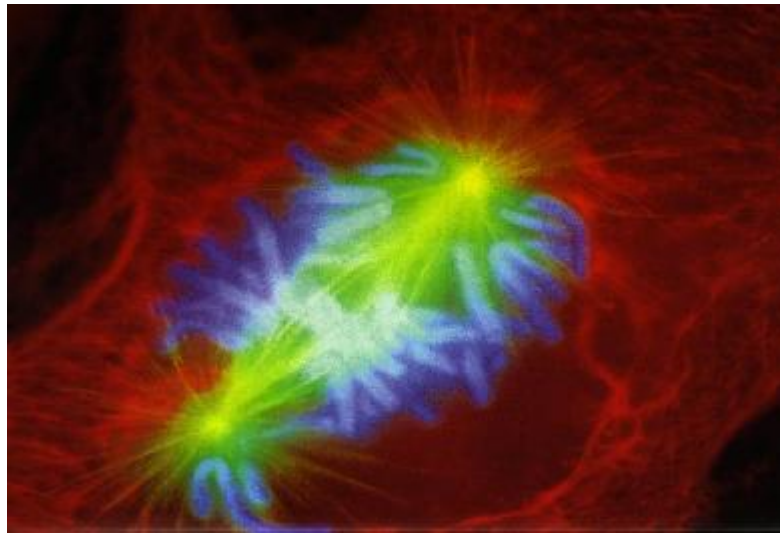
What are the two types of cell division? Can you identify them?

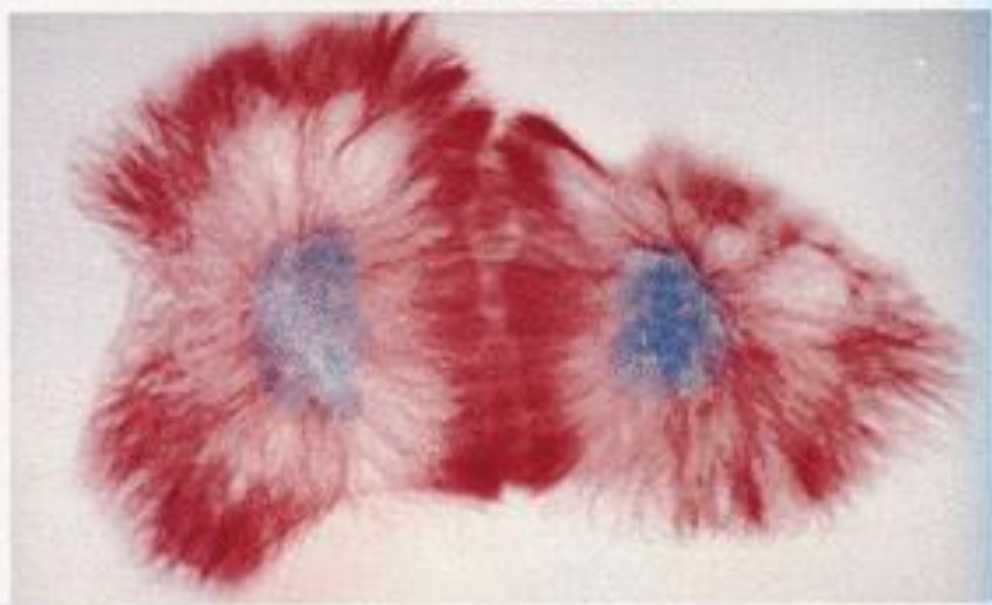
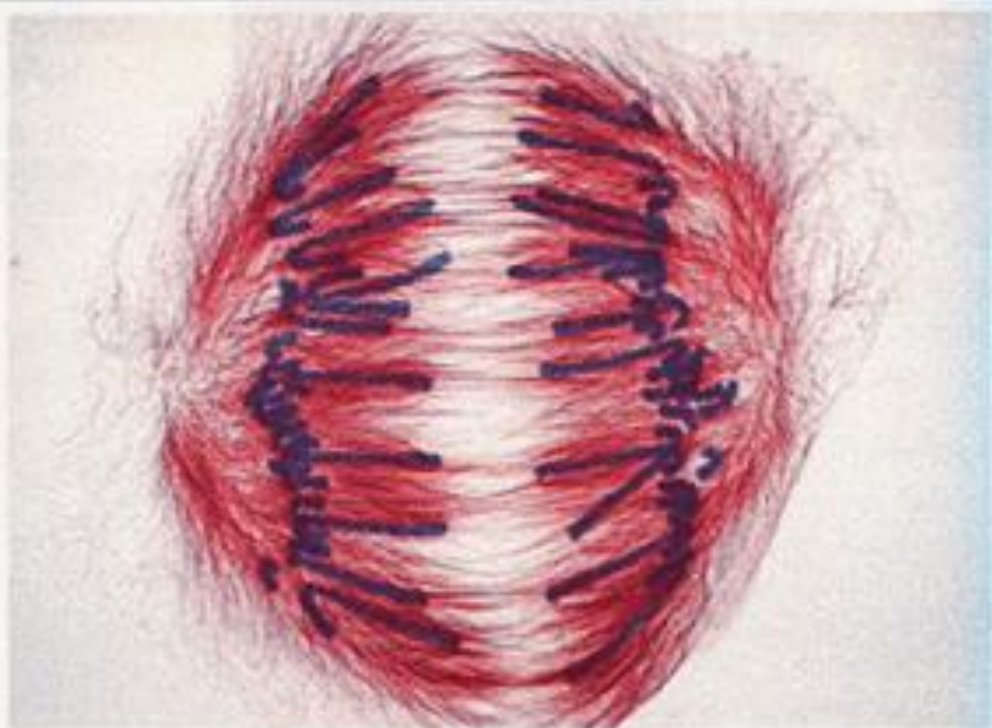
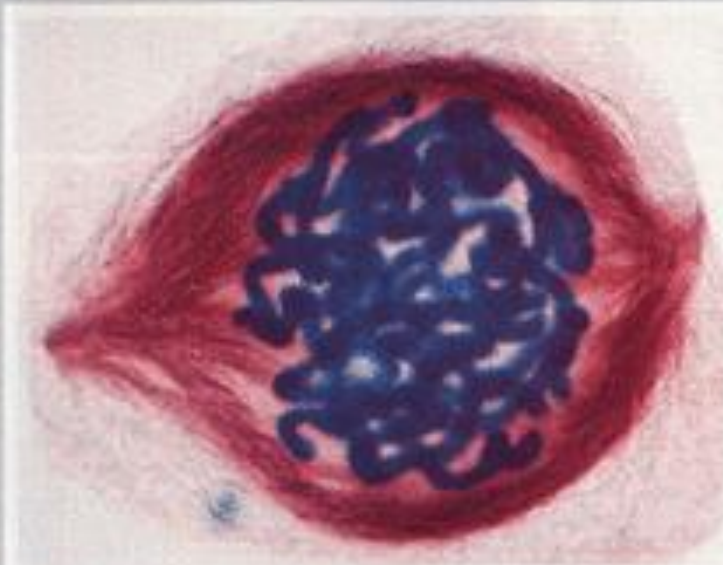


Cell Division

Objective:

Outline the stages (and occurrences) of mitosis and it's importance





Plant cells in various stages of mitosis: (a) prophase; (b) metaphase; (c) anaphase; (d) telophase (all magnified about 2,700 times).

Cell division

- There are two types of cell division:

- **Mitosis –**

T t t t t totally everywhere (growth & repair)

- **Meiosis**

S s s s s s sexy (sex cells only)

Activity - Mitosis Shared Recall

- In a group: Try and answer the following questions
 - What are the stages of Mitosis?
 - What happens in each stage?
 - What is the purpose of Mitosis (3)?

Mitosis Quiz!

How much can you remember?

- Answer the following questions
- True = Stand
- False = Sit

Question 1

True = Stand

False = Sit

If a flower pollinates itself, this is an example
of mitosis...

BONUS: If a cell that normally has 28 chromosomes
divides by mitosis... how many chromosomes will each
new cell have?

Question 2

True = Stand

False = Sit

- True or False . . .

The cells produced in mitosis are
genetically identical

Question 3

True = Stand

False = Sit

- True or False . . .

Bacteria reproduce using mitosis

Question 4

True = Stand

False = Sit

- True or False . . .

Sperm are produced by mitosis

Question 5

True = Stand

False = Sit

- True or False . . .

It is possible for a female green fly to
reproduce using mitosis

Answers

True = Stand

False = Sit

1. False (self pollination) – BONUS - 28

2. True

3. True

4. False - sperm are produced by meiosis

5. True - this process is called
parthenogenesis

Mitosis

<http://cellsalive.com/mitosis.htm>

- One cell splits into two identical **daughter** cells (cloning)



What are found in cells and contain the genetic information?

- Before the cell can divide the **chromosomes** have to be copied



Why do you think this is important?

- If the chromosomes weren't copied, each new cell would have half the normal number

http://www.youtube.com/watch?v=cvlpmmvB_m4

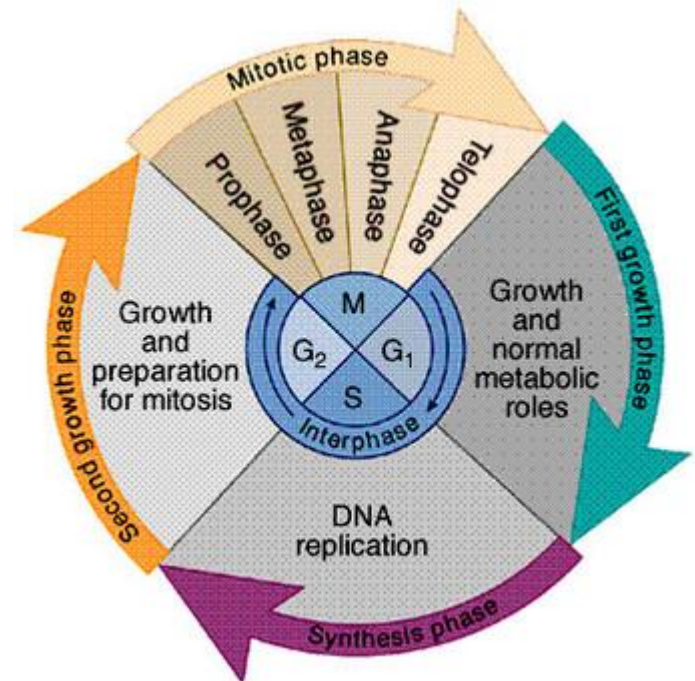
- A continuous process but for convenience:

Pre - Interphase

FOUR MAIN STAGES:

- Prophase
- Metaphase
- Anaphase
- Telophase

Post - Cytokinesis

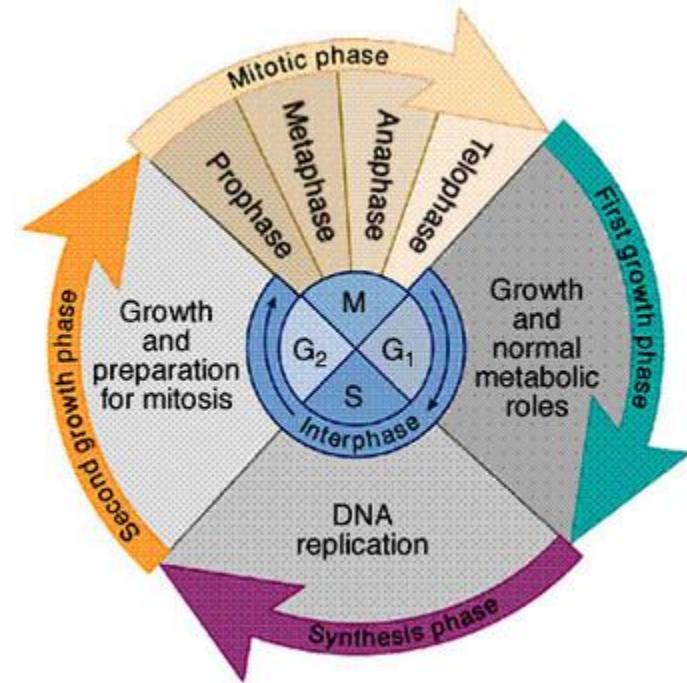


What is mitosis for?

- New body cells:
 - Growth
 - Cell Replacement (repair)
 - Regeneration (repair)
- Simple organisms can use mitosis to reproduce: **Asexual reproduction**

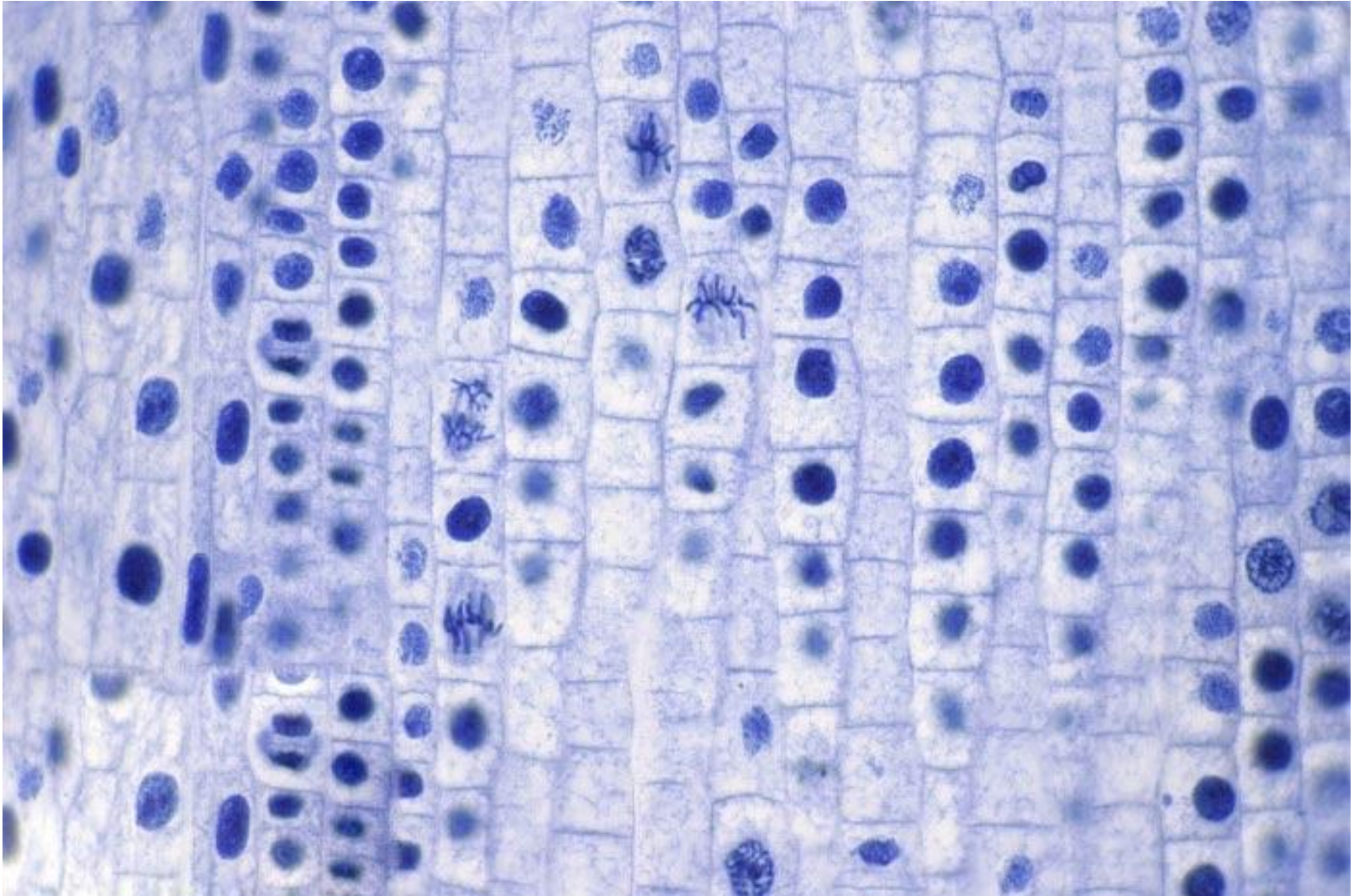
Interphase

- Prior to mitosis the cell is not resting!
- During interphase:
 - Cell growth/ Protein synthesis (G_1)
 - New DNA synthesised (S)
 - Continued growth, new cell organelles manufactured (G_2)



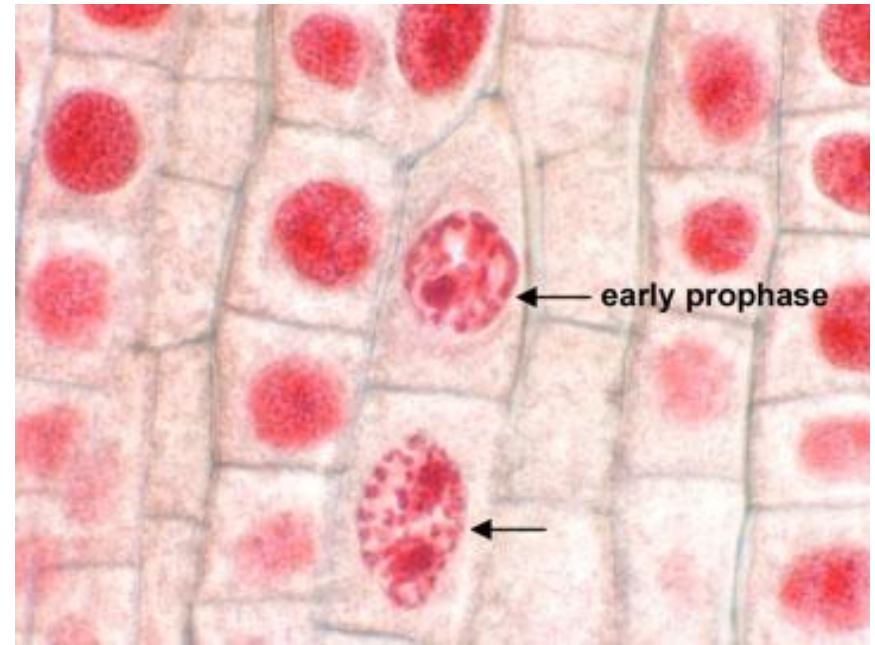
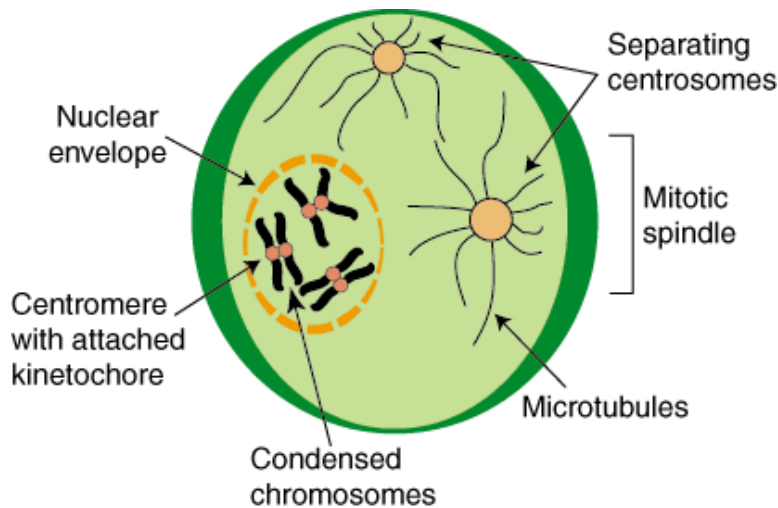
Onion Root Tips

Constantly undergoing mitosis (growth)



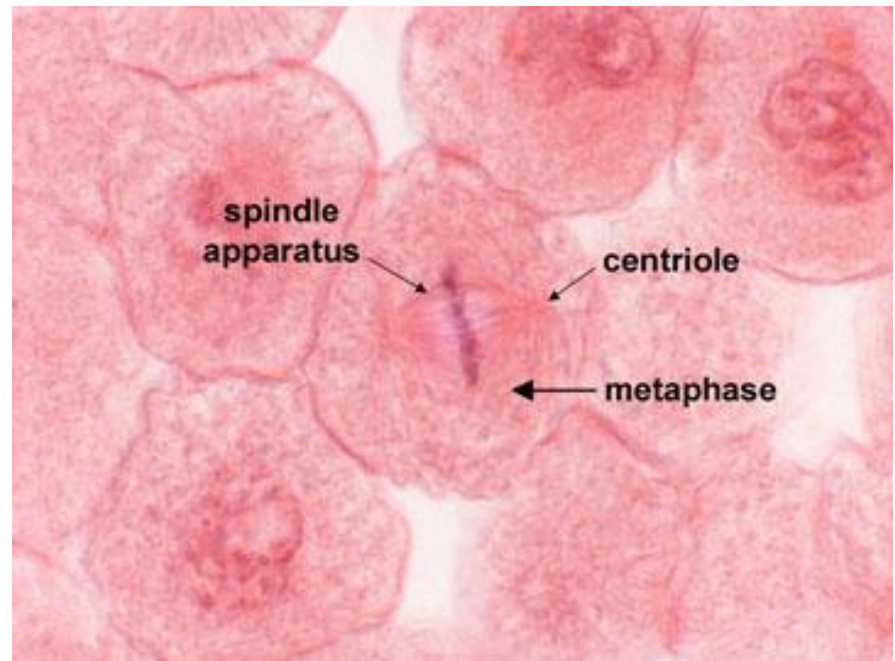
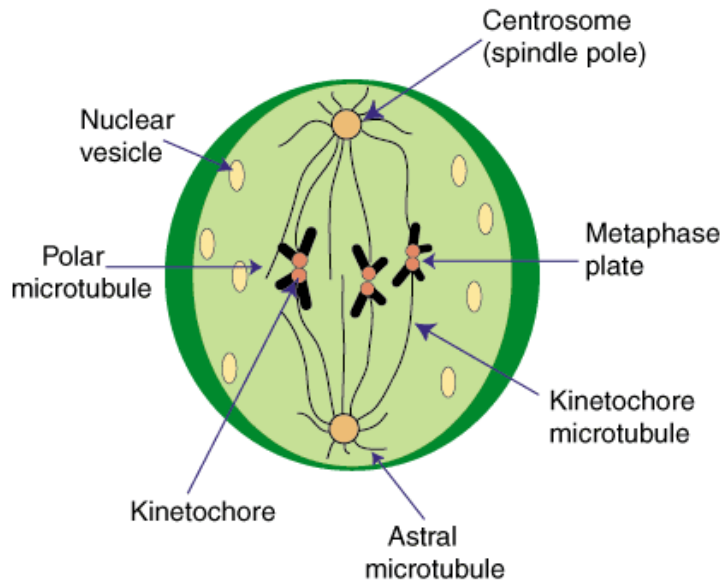
Prophase

- Nucleolus shrinks
- Centrioles move to opposite poles, spindle fibres begin to form
- Late prophase - chromosomes have 'supercoiled' and each can be seen as two chromatids joined at the centromere



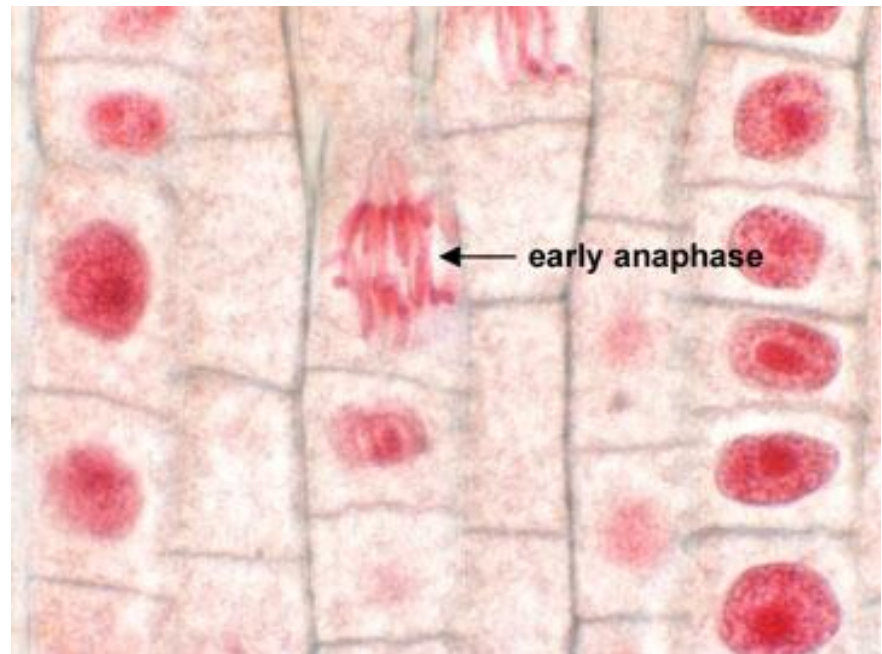
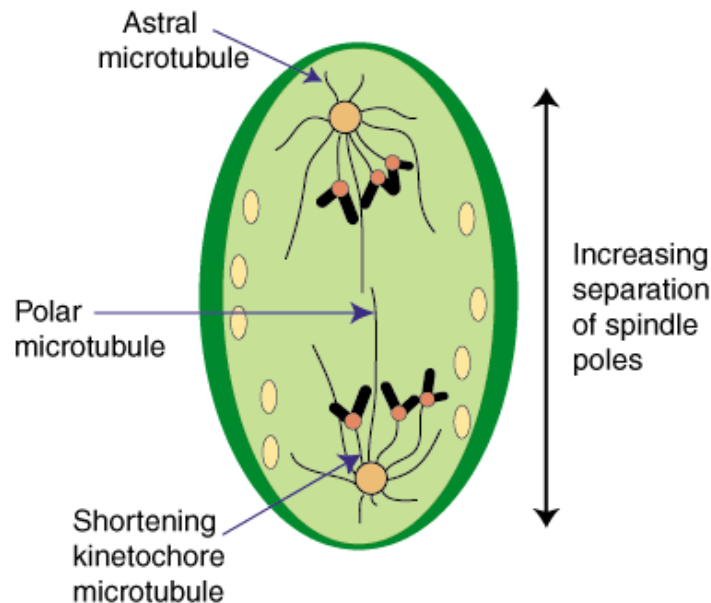
Metaphase

- Spindle fibres grow across cell
- Replicated chromosomes (pairs of chromatids) line up independently along the equator of the spindle attaching to the spindle at their centromeres



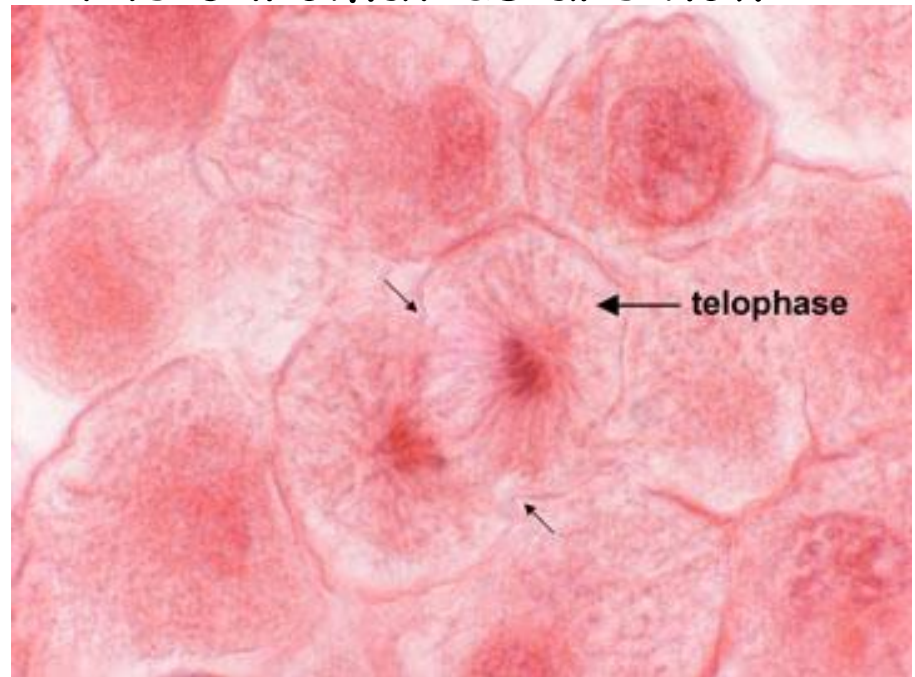
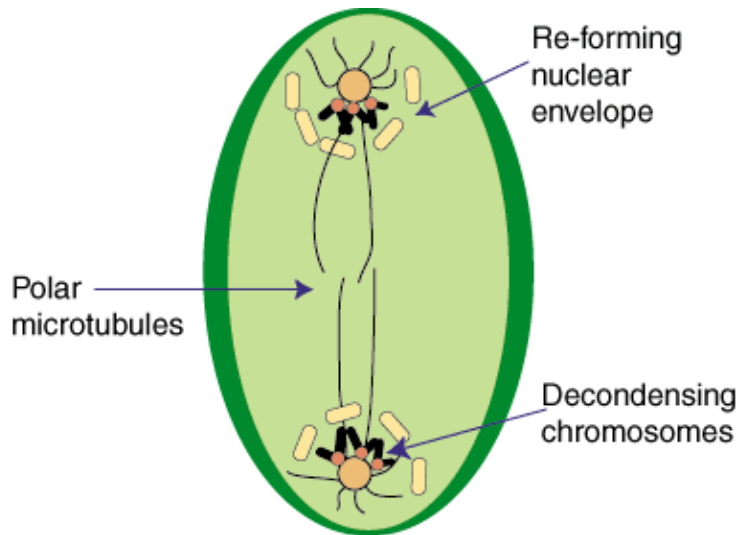
Anaphase

- Centromeres divide into two, separating the sister chromatids of each chromosome
- Spindle activity pulls the chromatids apart and the separated chromatids (now called chromosomes) move to opposite poles of the cell



Telophase

- Chromosomes begin to uncoil nuclear membrane begins to form around each set of chromosomes
- Cytokinesis (division of cytoplasm) now begins as cell membrane begins constricts towards centre of the cell
- Single chromatid from each chromosome has reached the poles of the spindle - the chromatids are now: chromosomes



Cytokinesis in Animal Cells

- There are two separate nuclei in the same cell. The cell needs to be split in half
- Begins in anaphase and continues through telophase
- Cell puckers in, 'furrowing'
- Takes place at right angles to the mitotic spindle, so that each nucleus is placed in a separate globule of cytoplasm

