KNOWLEDGE

Biology Topic B2 Cell Division

ORGANISER

Section 3: Microscopy

Magnification	The degree by which an object is **enlarged**. **Magnification = size of image / size of real object**
Resolution	The ability of a microscope to **distinguish detail**.
Light microscope	Basic microscope with a maximum magnification of 1500x. **Low resolution.**
Electron microscope	Microscope with a much **higher magnification** (up to 500 000x) and resolving power than a light microscope. This means that it can be used to study cells in much finer detail.

Section 4: Orders of Magnitude

Unit Prefix	Size in metres	Standard Form
Centimetre (cm)	0.01m	10^{-2}m
Millimetre (mm)	0.001m	10^{-3}m
Micrometre (μm)	0.000001m	10^{-6}m
Nanometre (nm)	0.000000001m	10^{-9}m

Section 5: Mitosis and the Cell Cycle

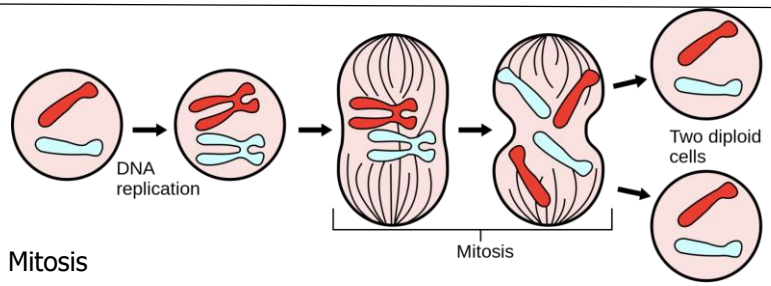
Number of **sub-cellular structures** (e.g. **ribosomes** and **mitochondria**) **increase**.

Number of **chromosomes double**.

One set of **chromosomes** is **pulled** to each end of the cell.

The **nucleus divides**.

Cytoplasm and **cell membranes divide** to form two **identical** cells



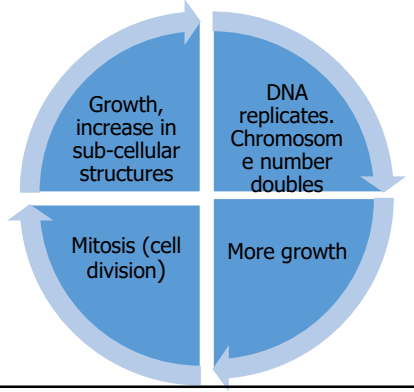
Mitosis

Section 6: Stem Cells

Stem Cell	Properties	Uses
Embryonic stem cell	Can divide into **most types** of cell.	**Therapeutic cloning** – embryonic stem cells produced with same genes as patient. **No rejection**.
Adult stem cell	Can divide into a **limited number of cells** e.g. bone marrow stem cells can form various blood cells.	
Meristem	Found in plants. Can differentiate (divide) into **any type** of plant cell.	**Clone** rare species to **prevent extinction**. **Crops** with **special features** can be clones

Pros and Cons of Using Stem Cells

Pros	**Treatment of diseases** such as diabetes, dementia and paralysis.
Cons	**Ethical** and **religious** objections. Can **transfer viruses** held within cells.



Cell cycle