

CELL

- The SMALLEST, most basic functional system of any living matter

CELL THEORY

- STATES: ALL living things are made up of cells
AND All cells come from other living things

Four characteristics COMMON to ALL living things:

1. GROWTH

cells increase in numbers OR they are replaced

2. MOVEMENT

Cells change in place/position

Example: a plant demonstrates movement as it grows

3. RESPONSE TO STIMULI

Living things respond internally and externally

4. REPRODUCTION

Living things always reproduce more of their own kind

Early SCIENCE

- 3000 years ago
- EARTH, AIR, FIRE, WATER



microscopes

Magnification

- Most microscopes have 3 objective lenses see page 393 in text
- SMALL -shortest (low power) – 4x
- MEDIUM(med power) – 10 x
- LARGE – longest (high power) - 40x
- EYE PIECE lens = 10x

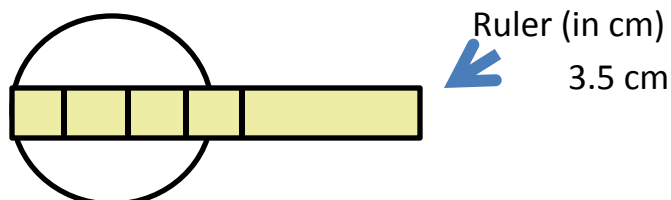
TO get TOTAL MAGNIFICATION, MULTIPLY the LENSES

$$\begin{aligned} \text{l.e. LOW power} &= (10x)(4x) \\ &= 40x \end{aligned}$$

$$\begin{aligned} \text{MEDIUM power} &= (10x)(10x) \\ &= 100x \end{aligned}$$

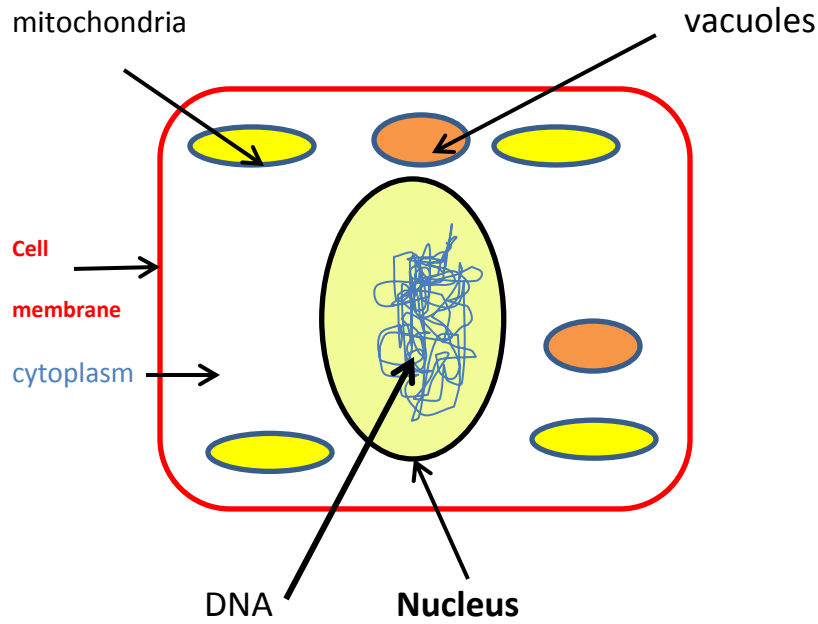
$$\begin{aligned} \text{HIGH power} &= (40x)(10x) \\ &= 400x \end{aligned}$$

You need to know the **SIZE of your field of view** (use a ruler)



PARTS of a cell

ANIMAL CELL



PLANT CELL



Differences

- plant cells have cell walls (for stability) while animal cells do not
- plants cells have chloroplasts (GREEN) while animal cells do not
- plant cells have fewer and larger vacuoles

Structures INSIDE a cell which have specific functions – called ORGANELLES

See page 405 in text

1. **CELL MEMBRANE**

- “selectively permeable”- some things pass through/others cannot
- Offers protection and hold cell together

2. **CELL WALLS**

- ONLY IN PLANTS
- Offers protection and creates shape

3. **NUCLEAS**

- CONTROL Center (the brain of the cell)

4. **DNA**

- The genetic material that codes ALL cell activity
- Chromosomes which carry ALL genetic information

5. **MITROCHONDIA**

- Changes nutrients into energy

6. **VACUOLES**

- Storage sacs for extra foole/waste
- ANIMAL CELLS: very SMALL but numerous
- PALNT CELLS: LARGE but few

7. CYTOPLASM

- Jelly/watery liquid within the cell
- Helps transportation and provides protection to cell

8. CHLOROPLAST

- IN PLANTS ONLY
- Location for photosynthesis
- Gives plants the GREEN colour

Page 415 #6

A – cell membrane

B - cytoplasm

C - nucleus

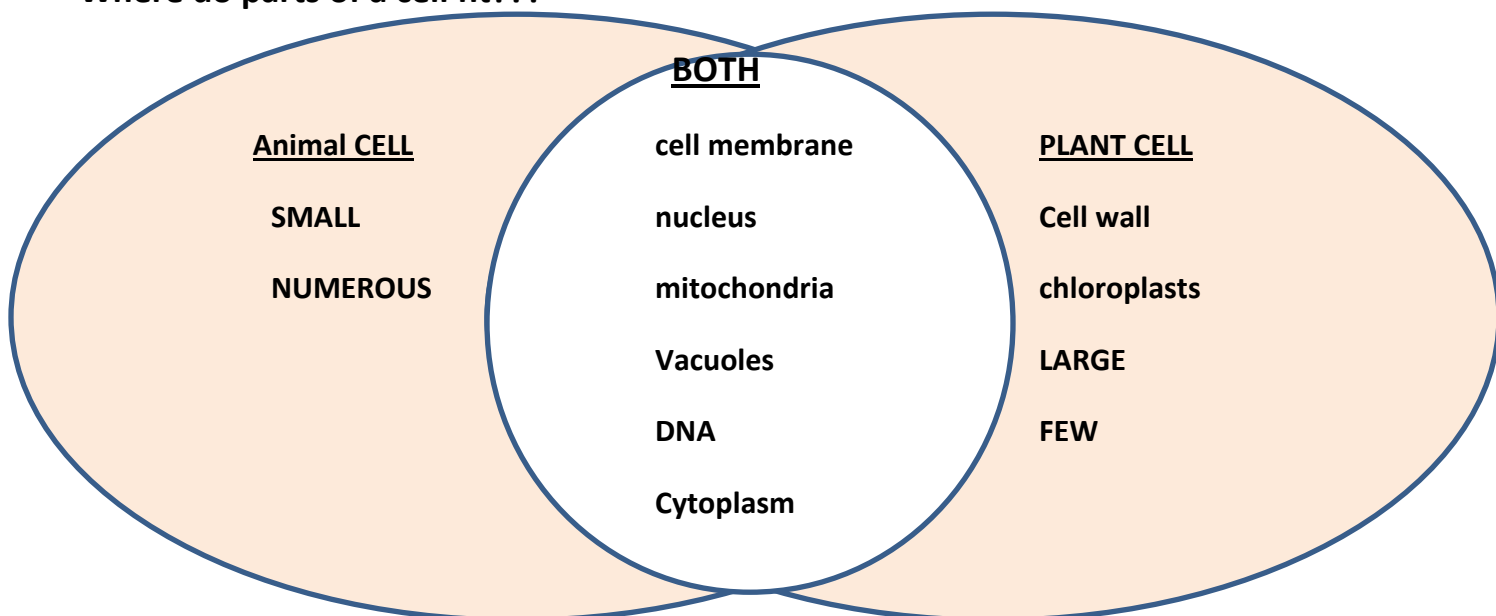
D- mitochondria

E- chloroplast

F-D.N.A

G- cell wall

Where do parts of a cell fit???



Growth and Reproduction of Cells

MITOSIS

- The process where cells DIVIDE to produce **MORE IDENTICAL CELLS**
- Ex. Skin cells – produce more cells to heal a cut or injury
- Bacteria cells use mitosis 2-4-8-etc
- Occurs In ALL BODY cells only BUT NOT SEX CELLS(sperm and egg)
- Nerve cells are the exception