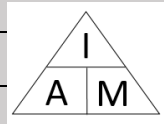


1 – Cell Structure and Specialised Cells

Eukaryotic Cell	Complex cell with a nucleus .
Prokaryotic Cell	Small simple cell with no nucleus.
Prokaryotic DNA	Stored as single DNA loop or small rings (plasmids) .
Ribosomes	Where proteins are synthesised .
Cell Wall	Made of cellulose -> strengthens plant and algal cells.
Sperm cells	Fertilise egg cells. Carry male DNA . Tail for swimming . Many mitochondria . Enzymes in head. Half a set of DNA .
Nerve cells	Carry electrical signals . Long and branched at the ends.
Muscle cells	Specialised for contraction . Cells are long and contain many mitochondria .
Root hair cells	Absorb water and minerals from the soil. Root hair projections provide a large surface area . No chloroplasts .
Xylem Cells	Form tubes that transport water and minerals around plant -> dead cells -> no end walls .
Phloem Cells	Form tubes that transport dissolved food around plants -> living cells -> small pores in end walls .

2 - Microscopy

Magnification	Higher magnification = larger image.
Resolution	Higher resolution = clearer image.
Equation	Magnification = Image size / Actual size
Units	From mm to µm x 1000 . From µm to mm ÷ 1000 .
Preparing an Onion Slide	Peel thin layer with tweezers -> place on slide -> add iodine stain -> lower cover slip gently to avoid bubbles.
Using a Light Microscope	Place on stage -> use lowest power objective lens -> adjust with course focus then fine focus -> repeat with higher magnification if needed.
Electron Microscope	Higher magnification and resolution than a light microscope.



3 – Cell Cycle and Stem Cells

Chromosomes	Molecules of DNA , 23 pairs found in nucleus , carry genes .
Cell Cycle	Three stages -> growth & DNA replication , mitosis and cell division .
Growth & DNA Replication	Cell grows -> number of subcellular structures increases -> DNA replicates -> forms X shaped chromosomes .
Mitosis	Cell division. Chromosomes line up in centre -> pulled apart by fibres -> two nuclei formed -> cytoplasm and cell membrane divides . Creates two identical daughter cells .
Differentiation	Process by which cells become specialised .
Stem Cells	Undifferentiated cells -> can become different types of cell .
Embryonic Stem Cells	Grown in lab -> made to specialise -> used to replace faulty cells -> treats disease e.g. diabetes and spinal damage .
Adult Stem Cells	Cells transferred from bone marrow -> replaces faulty blood cells in patient.
Plant Stem Cells	Found in meristems (tissues in the tips of roots and shoots) -> used to produce clones of rare species and crops with desired features (e.g. disease resistance).

4 – Cell Transport

Diffusion	Net movement of particles -> from a higher to lower concentration -> down a concentration gradient .
Osmosis	Net movement of water molecules -> across a partially permeable membrane -> from a higher to lower water concentration -> down a concentration gradient .
Active Transport	Movement of particles -> from a lower to higher concentration -> against a concentration gradient -> requires energy .
Factors that Increase Rate of Cell Transport	Steeper concentration gradient, larger surface area, shorter diffusion pathway.

