

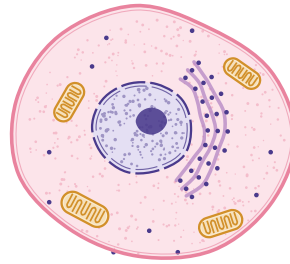
Cell structure

Eukaryotic (animal and plant): DNA enclosed in a nucleus

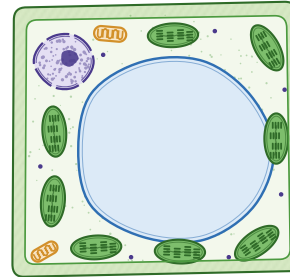
Prokaryotic (bacteria): no nucleus, a single DNA loop and plasmids

Plant only: cell wall, chloroplasts, permanent vacuole

Specialised cells have adaptations, e.g. sperm, nerve, root hair



Animal cell



Plant cell

Microscopy

magnification = size of image ÷ size of real object

mm → μm → nm: multiply by 1000 at each step

Electron microscopes have higher magnification and resolution, so they show ribosomes and the inside of mitochondria

Light microscopes can view living cells

learn the equation!

Transport in cells

Diffusion: particles move from high to low concentration

Osmosis: water moves from a dilute to a more concentrated solution through a partially permeable membrane

Active transport: against the concentration gradient, using energy from respiration

Small organisms have a large **surface area to volume ratio**

only active transport needs energy!

AQA GCSE Biology, Topic 1

Cell biology

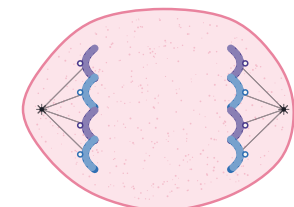
Cell division

Chromosomes come in pairs: **23 pairs** in humans

Cell cycle: the cell grows and copies its DNA, then divides by mitosis

Makes **2 genetically identical** cells

Used for growth, repair and asexual reproduction



Stem cells

Undifferentiated cells that can become other types of cell

From embryos, adult bone marrow and plant **meristems**

Could help treat diabetes and paralysis; used to clone plants

Concerns: ethical objections, risk of passing on infection