

## CELL STRUCTURE

Tissue - A group of cells working together to carry out a specific function

Organ - A group of tissues working together to carry out a specific function out

Organ System- A group of organs working together to carry out a specific function

Organelles found within animal cells -  
- Nucleus -mitochondria - ribosomes -cell membrane - cytoplasm

Organelles found within Plant cells -  
-Nucleus -Mitochondria - ribosomes -cell membrane - cytoplasm -permanent vacuole -chloroplasts -cell wall

## CHEMICAL ELEMENTS

lipids - C, H, O (Carbon, Hydrogen and Oxygen)

proteins - C, H, O, N, S (Carbon, Hydrogen, Oxygen, Nitrogen and Sulphur)

complex carbs like starch and glycogen are made up of - simple sugars

Proteins are made up of - amino acids

the two molecules that Lipids are made up of - Glycerol and fatty acid tails

## FUNCTIONS OF THE ORGANELLES

Nucleus - controls the cell -contains genetic material (In the form of chromosomes)

Cytoplasm - where most of the chemical reactions take place

Mitochondria - where aerobic respiration takes place

Ribosomes - the site of protein synthesis

Cell wall - provides strength and support (Made out of cellulose)

Permanent Vacuole - supports the cell and contains cell sap (A solution of sugars and salt)

Chloroplasts - the site of photosynthesis

Cell Membrane - controls what enters and leaves the cell - separates the cell from its environment

## ENZYMES

enzymes - biological catalysts that increase rate of metabolic reactions

factors that effect enzyme function - Temperature -pH - Substrate concentration -Enzyme concentration

effect of temperature -as temperature increase, rate of reaction increases *UNTIL* the temperature exceeds the optimum and the rate of reaction begins to decrease

## ENZYMES (cont)

Why does this happen? - as temperature increase, particles have more kinetic energy, increasing chance of collision between molecules which speeds up the reaction

when the temperature exceeds optimum - active site distorts as the enzyme *denatures* and it no longer fits the substrate

effect of pH - the rate of catalysed reaction is fastest at the optimum pH. If the pH is too high or too low, the enzyme may denature and this affects rate of reaction

## STEM CELLS (HIGHER)

Differentiation - the process by which cells become specialised

Stems cells - unspecialised cells that can differentiate into lots of different types of cells

ADVANTAGES -can be used to treat paralysis -possibility to cure degenerative diseases like Parkinson's -Whole new tissues and organs can be grown for drug testing

DISADVANTAGES -use of embryonic cells creates ethical issues -it's expensive -long-term side effects are unknown



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## DIFFUSION

diffusion - the movement of molecules from an area of high concentration, to an area of low concentration

how does **temperature** affect the rate of diffusion - as temperature increase, rate of diffusion increases as particles gain kinetic energy and move faster

how does **concentration gradient** affect rate of diffusion - the greater the concentration gradient (The difference between the two areas), the greater the rate of diffusion

how does **surface area of the membrane** affect rate of diffusion - as surface area increases, rate of diffusion increases as there is more space for the particles to pass through

OSMOSIS - **the movement of water molecules from a high water concentration to a low water concentration** (Down the water potential gradient) through a partially permeable membrane.

ACTIVE TRANSPORT - **the movement of particles from an area of low concentration to an area of high concentration** (Going against the concentration gradient)



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