

Knowledge Organiser: Biology, SB1a

Magnification is the number of times larger an image is than the initial object that produced it.

Resolution is the smallest distance between two points that can still be seen as two points.

Eukaryotic cell is one which contains a nucleus.

Prokaryotic cell is one which does not contain a nucleus

The **field of view** is the circular area you see in a light microscope

Specialised cells are adapted to suit a particular function

Examples of specialised cells are the **egg cell**, **sperm cell**, **ciliated epithelial cells** and **small intestine cells**

Plasmids are small circular rings of DNA in bacterial cells

Small intestine cells have membranes with many folds (**villi**) to increase their surface area for faster absorption of molecules

Sperm cells and egg cells are **haploid**, which means they only have one full set of chromosomes.

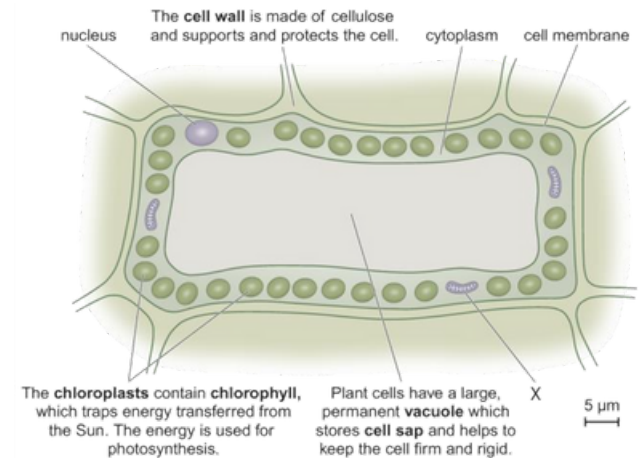
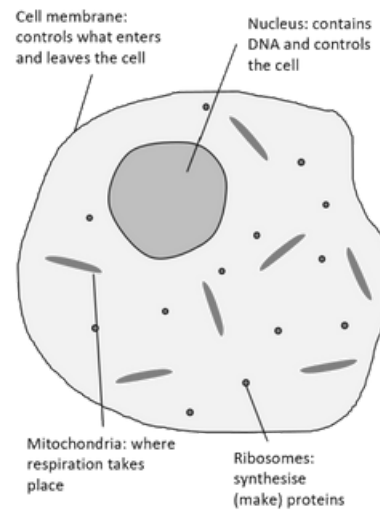
Ciliated epithelial cells have hair like cilia that wave from side to side and sweep substances along like mucus in airways or an egg cell in an oviduct

Digestive enzymes break down large insoluble molecules into smaller soluble molecules

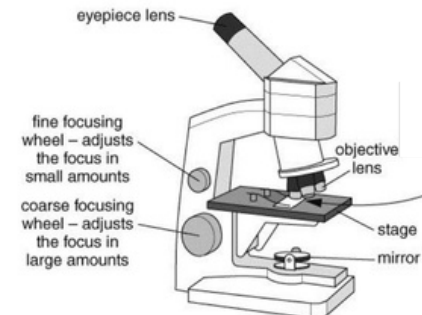
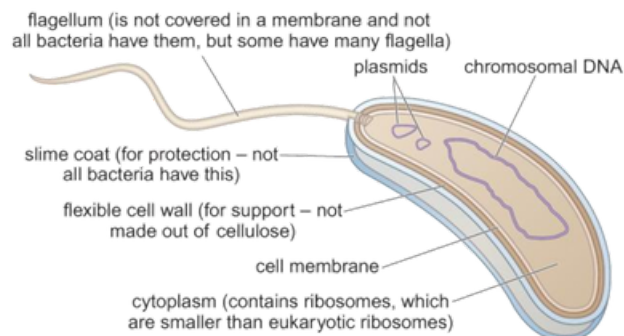
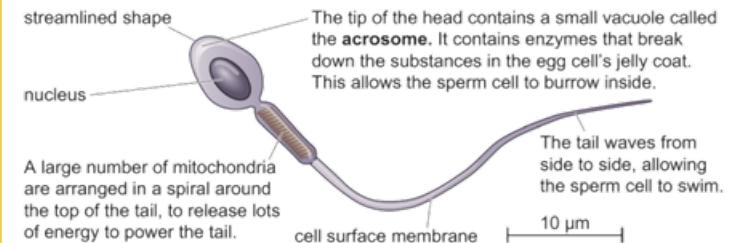
The enzyme for breaking down protein is **protease**

The enzyme for breaking down carbohydrate is called **amylase** The enzyme for breaking down fats and lipids is called **lipase**

An **enzyme** is a biological catalyst The substances that enzymes work on are called **substrates**



$$\text{Mag} = \frac{\text{Size of image}}{\text{Size of object}}$$



Knowledge Organiser: Biology, SB1b

Diffusion is the movement of particles from an area of high concentration to an area of low concentration

Osmosis is the movement of water particles from an area of high concentration of water particles to an area of low concentration of water particles across a semi permeable membrane

The difference in concentration between two areas is known as the **concentration gradient**

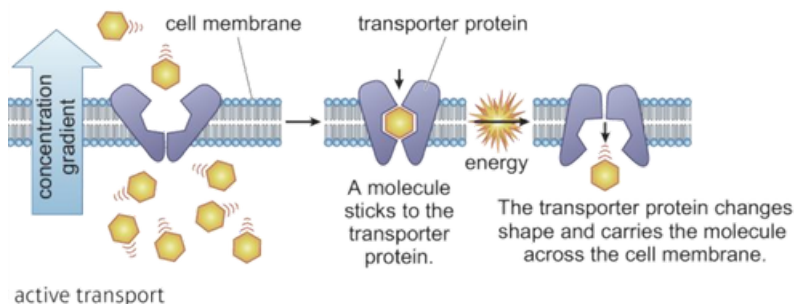
Active transport is the movement of particles against the concentration gradient and requires energy to do so

Diffusion and osmosis are **passive process** which means they do not require energy to take place.

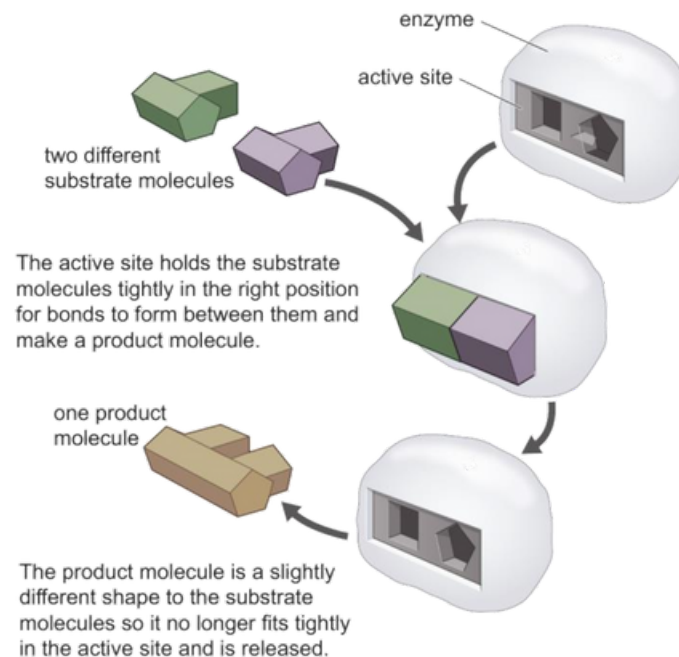
Active site is the space in an enzyme where the substrate fits during an enzyme catalysed reaction

When the shape of an enzymes active site has changed shape due to heat or phso will no longer fit the substrate, we say it is **denatured** **Lock and key model** describes the way an enzyme

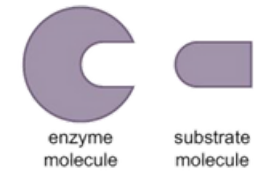
catalyses a reaction when a substrate fits within the active site of the enzyme



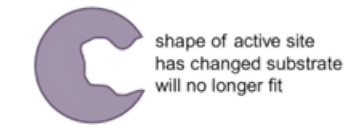
Enzyme	Where found	Reaction Catalysed
Amylase	Saliva and small intestine	Breaking down starch into small sugars such as maltose
Catalase	Most cells but especially liver cells	Breaking down hydrogen peroxide that is made in many cells reactions into water and oxygen
Starch synthase	Plants	Synthesis of starch from glucose
DNA polymerase	Nucleus	Synthesis of DNA from its monomers



normal conditions

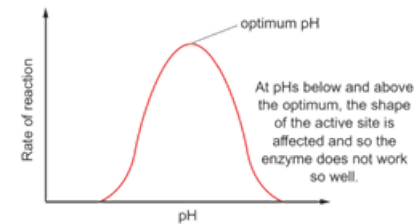


extreme conditions

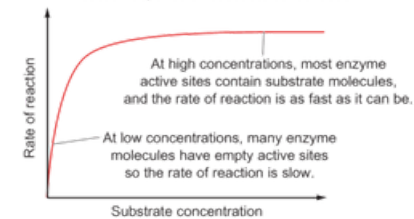


denatured enzyme

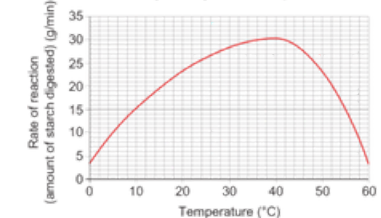
How the rate of an enzyme-controlled reaction depends on pH



How the rate of an enzyme-controlled reaction depends on substrate concentration

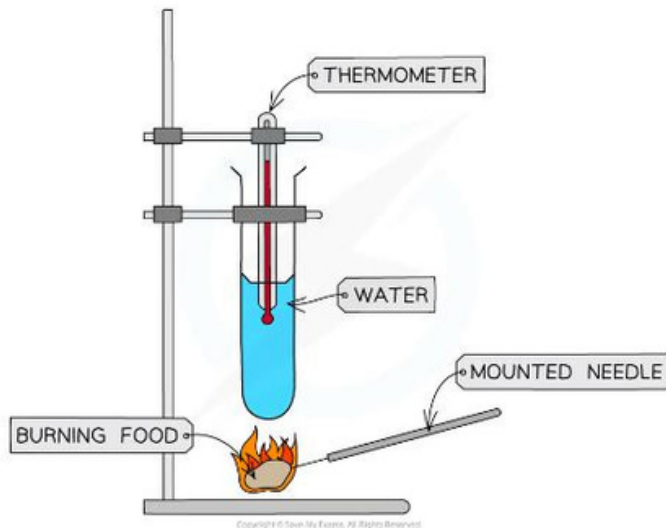
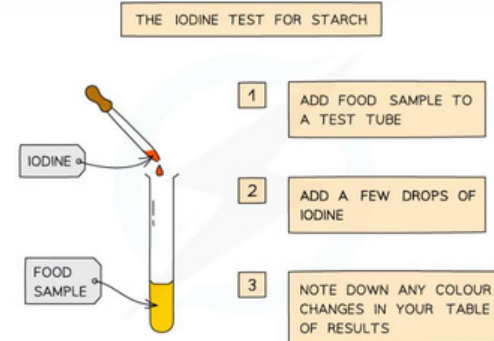
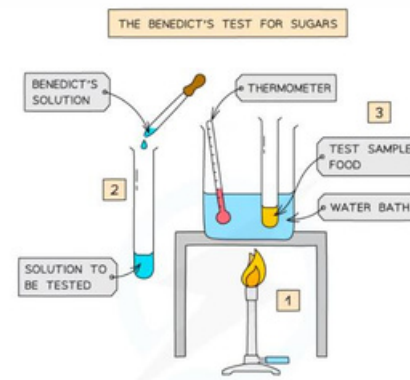


How the rate of starch breakdown using an amylase depends on temperature



Knowledge Organiser: Biology, SB1c Separate content

Food Test	Colour of reagent	Positive test result	Negative test result
Iodine for starch	orange-brown	blue-black	orange-brown (no change)
Benedict's for sugar	light blue	green to brick-red	light blue (no change)
Ethanol for lipid	colourless	cloudy emulsion	colourless (no change)
Biuret for protein	blue	lilac-purple	blue (no change)



- A **larger increase** in **water temperature** indicates a **larger amount of energy** contained by the sample
- We can calculate the energy in each food sample using the following equation:

Energy transferred (J) =

$$(\text{mass of water (g)} \times 4.2 \times \text{temperature increase (}^{\circ}\text{C)}) \div (\text{mass of food (g)})$$