**Enzymes**

Enzymes are biological catalysts.

They are globular proteins, as they point their hydrophilic groups outside, and their hydrophobic groups inside, so that they can dissolve in water.

**Induced fit theory**

This is where the enzyme changes shape when the substrate fits into it, which slightly deforms the substrate to make the reaction easier occur, decreasing the activation energy for the reaction.

**Enzyme Properties**

* Specific to one reaction - specificity
* Active site is determined by the tertiary (and therefore primary) structure.

Anabolic reactions are reactions that build up molecules.

Catabolic reactions are reactions that break down molecules.

The metabolism is the total sum of chemical reactions in an organism

A metabolic pathway is a number of linked reactions that perform one task, e.g:

starch->maltose->glucose

**Temperature Effects**

More heat = more kinetic energy = faster movements of enzyme & substrate.

This means more collisions so faster rate of reaction.

Too much heat can cause the particles in the enzyme to vibrate so much that they can break the bonds holding the primary structure together, which causes the tertiary structure to change, which means the enzyme is denatured.

**pH Effects**

Most enzymes best at pH7.

Outside of the optimum, the H+ ions in acids or OH- ions in alkalis can break the ionic bonds that hold the tertiary structure, so the active site is changed to means that the enzyme can no longer function correctly.

**Concentration**

Up to the saturation point, **substrate** concentration affects the rate of reaction.

At the saturation point, all the enzymes are being used, so no more enzymes are available to catalyse reactions until the other reactions have completed. This means the rate of reaction stops increasing.

**Enzyme** concentration will cause the rate of reaction to increase linearly until all the substrate is used up, at which point the rate of reaction drops to 0.