**B3 - ENZYMES**

1. **Define enzymes** -proteins that function as biological catalysts – they speed up chemical reactions but are themselves unchanged. Their action relies on their shape, as their substrate molecule (s) fit into their active site as in the lock & key hypothesis:



1. **Investigate and describe the effect of changes in temperature and pH on enzyme activity.**
2. **Explain the effect of changes in temperature and pH on enzyme activity.**

***Effect of temperature on enzymes***



* As temperature increases, the chance of chance of substrate molecules and enzymes colliding also increases, so the rate of reaction goes up.
* This continues to an optimum (best) temperature for an enzyme. For most human enzymes the optimum temperature is 37oC (body temperature).
* Above this temperature, the bonds holding the enzyme together start to break so it changes shape
* This deforms the active site, so enzyme and substrate cannot fit together – the enzyme has been denatured. Most enzymes **denature** above 50oC.

***Effect of pH on enzymes***



* The pH of a solution is how acidic or alkaline it is.
* Most human enzymes have an optimum pH of 7 (neutral). Some exceptions:

Pepsin, a protease in the stomach has an acidic optimum (pH2);

Lipase in the duodenum has an alkaline optimum (pH 9)

Salivary amylase in the mouth prefers a slightly-acidic pH of 6.8.

* Extreme of pH affect the shape of enzymes, denaturing them.