Lock and Key model –

- Complementary shapes
- Reactants fit into the enzymes active sites
- Specific shapes

Induced fit model –

- The enzyme or the reactants change their shape slightly when the substrate fits into the active site
- Fit becomes perfect during the process

FACTORS AFFECTING ENZYME ACTIVITY –

1. Enzyme concentration – if the amount of enzyme increases, the amount of product made per unit of time increases
2. Substrate concentration – the addition of more substrate to an enzyme solution initially increases the rate of reaction. The reaction rate will stop increasing once all active sites are occupied
3. Temperature – At high temperatures, enzymes are permanently denatured. Enzymes can become inactive at low temperatures but will then become active again at normal temperatures. Enzymes in different organisms have different optimal temperatures (eg: humans 37 degrees)
4. pH – each enzyme acts best at a particular pH (optimal pH). A change in pH from the optimal can change the shape of an enzyme affecting its ability to combine with its substrate.
5. Inhibitors – metabolic inhibitors bind with the active sites. COMPETITIVE inhibitors compete with the substrate for an enzymes active site. NON-COMPETITIVE inhibitors bind to another site, other than the active site, which changes the shape of the enzyme so the substrate can no longer bind to an active site.

Chemical energy within cells

EXERgonic reactions (catabolic)

- Release energy
- Occur spontaneously
- Oxygen used
- BREAKDOWN
- Eg: cellular respiration – breakdown of ATP

ENDERgonic reactions (anabolic)

- Require energy
- Do not occur spontaneously
- Oxygen given off
- BUILD UP
- Eg: photosynthesis – ATP production

ATP is the immediate source of energy for all cells

PHOTOSYNTHESIS – aim is to convert light energy into chemical energy

- Occurs at the chloroplast in eukaryotes