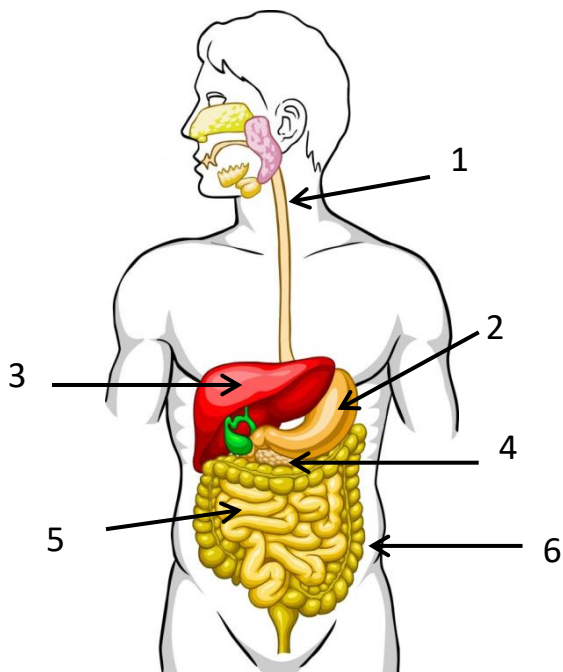


1. Digestive system

	Organ	Function
1	Oesophagus	Muscle contractions push food into the stomach.
2	Stomach	Hydrochloric acid and pepsin chemically digest food, stomach muscles churn the food.
3	Liver	Produced bile that is added into the first part of the small intestines called the duodenum.
4	Pancreas	Produces enzymes that are released into the small intestines to complete digestion.
5	Small Intestines	Chemical digestion continues and small soluble molecules are absorbed into the blood.
6	Large intestines	Water is removed from the waste faeces and absorbed back into the blood.



2. Key words

Optimum	The best conditions for the reaction to take place fastest.
Active site	The specific point in the structure of the enzyme where the reaction occurs.
Denature	When the active site changes shape permanently so the enzyme no longer binds to the substrate.
Emulsify	When fat droplets are broken down into small ones to help mix them with the enzyme and increase the surface area for digestion.
Bile	Alkali released from the liver in the duodenum to neutralise stomach acid and emulsify fats.

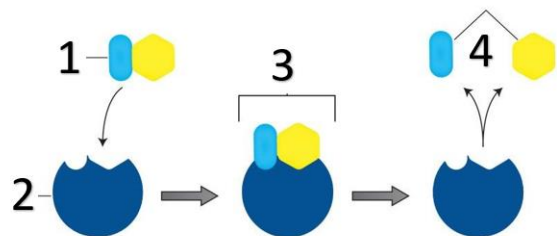
3. Enzymes

Enzymes are **biological catalysts** that speed up the digestion of large insoluble molecules to small soluble ones that can be absorbed into the blood.

Enzyme	Released from	Function
Amylase	Salivary glands, pancreas and small Intestines.	Breaks down starch into glucose.
Protease (Pepsin)	Stomach (pepsin), pancreas and small intestines.	Breaks down proteins into amino acids.
Lipase	Pancreas and small intestines.	Breaks down fats into fatty acids and glycerol.

4. Lock and key model

Lock and key model		Model used to describe represent how an enzyme and substrate molecule bind together.
1	Substrate	Molecule the enzyme will act on.
2	Enzyme	Protein molecule that acts as a catalyst to speed up a reaction.
3	Enzyme-substrate complex	Molecule consisting of the substrate locked into the active site of the enzyme.
4	Product	Molecule produced following the enzyme reaction.



5. Factors affecting the rate of an enzyme reaction

Temperature	Concentration	pH
As the temperature is increased the particles gain energy increasing the number of successful collisions. Above 40°C, the rate decreases as the enzymes denature.	As the concentration increases the frequency of collision increases and the rate increases. Eventually the rate levels out as the concentration is no longer the limiting factor.	Each enzyme works in a specific pH range. If the enzyme is taken out of this optimum range the active site denatures and the rate decreases.

6. Nutrient groups

Nutrient	Function	Food sources
Carbohydrate	Used to release energy from respiration.	Pasta, bread, potatoes, sugars.
Protein	Growth and repair.	Meat, fish, soya and nuts.
Lipids (fats)	Store of energy, insulation.	Butter, cheese, oily fish.

7. Food tests

	Food test	Tests for	Positive result
1	Iodine	Starch	Turns blue/black
2	Biuret's reagent	Protein	Turns purple
3	Ethanol	Lipids	Turns cloudy
4	Benedict's solution	Sugars	Turns yellow, orange and red