

# Knowledge



1. They are proteins that act as catalysts in the body
2. They speed up chemical reactions
3. Protease
4. To kill bacteria in food and drink and to provide the optimum conditions for protease to work in
5. Neutralising acidic stomach contents in the small intestine and emulsifying bile

6.

Enzyme	Acts on	Products
Amylase	Starch	Glucose
Protease	Proteins	Amino acids
Lipase	fats	Fatty acids & glycerol

7. Diffusion (and some by active transport)
8. It increases the surface area for enzymes to work on
9. They get denatured – the shape of the active site changes
10. Biuret
11. Brick red

# Application

1. Food has to be digested because the main food groups – starch, fat and protein – are too big to diffuse through the membrane of the small intestine, they need chopping into smaller, soluble molecules.
2. The stomach contracts and relaxes to churn food with gastric juice
3. Bile is made in the liver, stored in the gall bladder and tipped into the small intestine after eating.
4. Bile emulsifies fats which means it breaks them into smaller droplets of fat – this increases the surface area available for lipase enzymes to work on.
5. Bile also neutralises the acidic contents coming from the stomach, which means the pH of the intestines is better for the enzymes found there

6. When fats are digested, glycerol and fatty acids are produced. The fatty acids lowers the pH as they are acids.

7. Fatty acids and amino acids diffuse from inside the small intestine, where they are at a high concentration, to the blood, a lower concentration, across the small intestine wall

8. Sugar can be tested for by covering the food with Benedicts solution and putting in a hot water bath for around 10 minutes. An orange-red colour is positive for sugar

9. Put 5cm<sup>3</sup> starch solution into a test tube and add 2-3 drops of iodine. It should turn blue-black. Use the Bunsen to heat the tube to 20°C and then add 1cm<sup>3</sup> amylase. Start the stopwatch and time until the blue-black colour disappears. Repeat, but use different temperatures – 30, 40, 50, 60 °C. Keep all the volumes the same.

- Use a water bath with a thermostat instead of a Bunsen
- At certain temperatures or pH's, enzymes become **denatured**. This mean that the **shape** of the **active site** changes and the **substrate will no longer fit** into the active site, so the enzyme does not work.