

Y8: Nutrition and Digestion Knowledge Organiser

Nutrients in food

Nutrient	What is it needed for?	Foods
Carbohydrates	Provide energy	Sugar, bread, pasta, rice, potatoes.
Protein	For growth and repair of tissues	Meat, fish, dairy, lentils, nuts.
Lipids	Energy and insulation	Olive oil, avocados, oily fish, nuts, sunflower oil, fatty meats, butter.
Fibre	Helps reduce cholesterol and move food through the intestines.	Wholewheat bread and cereals. Vegetables.
Vitamins	Essential for many processes, e.g., bone growth, metabolic rate, immune system, vision, nervous system.	A – dairy, oily fish, yellow fruit; C – citrus fruit, broccoli, sprouts; D – oily fish, eggs, fortified cereals.
Minerals	Essential for many processes, e.g., bone growth/strength, nervous system, red blood cells, immune system.	Calcium – milk, canned fish, broccoli; iron –, brown rice, meat; potassium – fruit, pulses, white meat.
Water	Chemical reactions take place in water and the blood transports substances dissolved in water. Water is lost in urine, sweat and breathing out.	Fruit and vegetables.

Enzymes

Enzymes are biological *catalysts*– they speed up chemical reactions in living things. Enzymes are needed to speed up the break down of food from large insoluble molecules, to smaller, soluble molecules.

Carbohydrases break down **carbohydrates** into **sugars** (for example amylase breaks down starch into glucose).

Proteases break down **proteins** into **amino acids**.

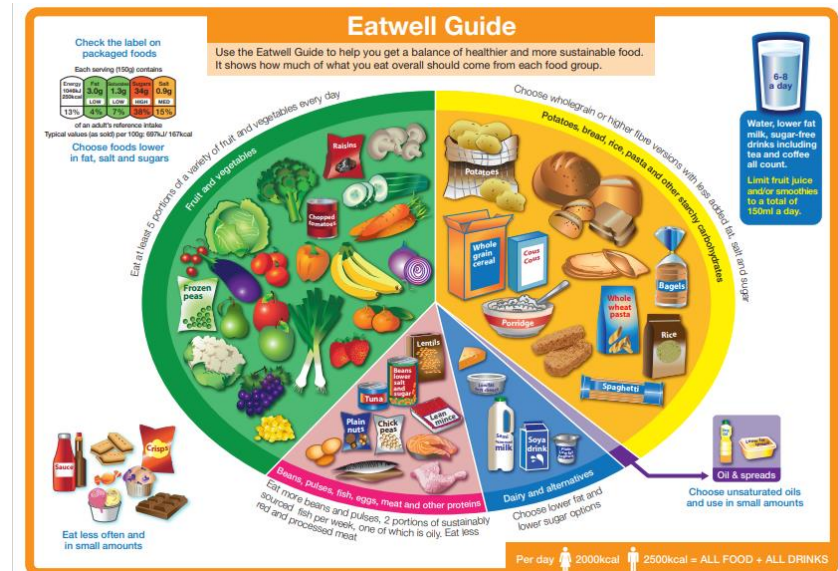
Lipases break down **lipids** into **fatty acids** and **glycerol**.

Food Tests

Food Test	Colour of reagent	Positive test result	Negative test result
Iodine for starch	orange–brown	blue–black	orange–brown (no change)
Benedict's for sugar	light blue	green to brick–red	light blue (no change)
Ethanol for lipid	colourless	cloudy emulsion	colourless (no change)
Biuret for protein	blue	lilac–purple	blue (no change)

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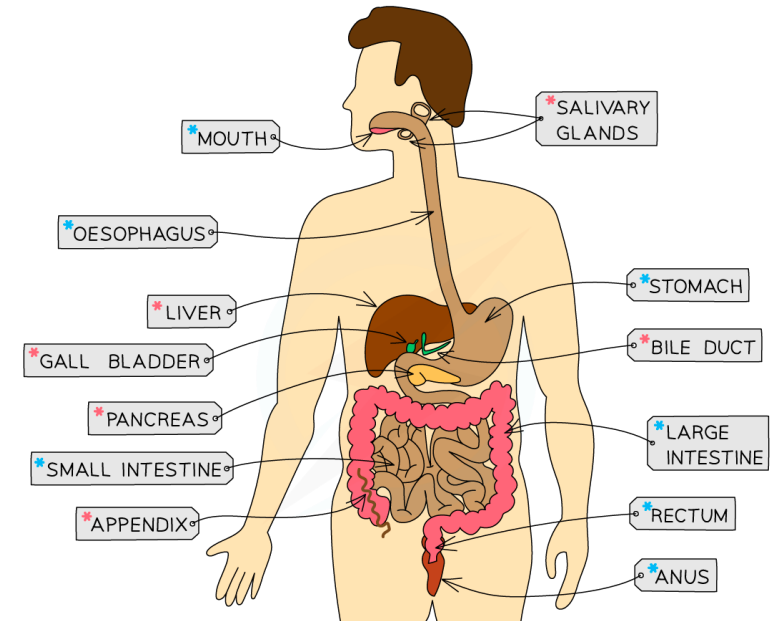
Balanced Diet



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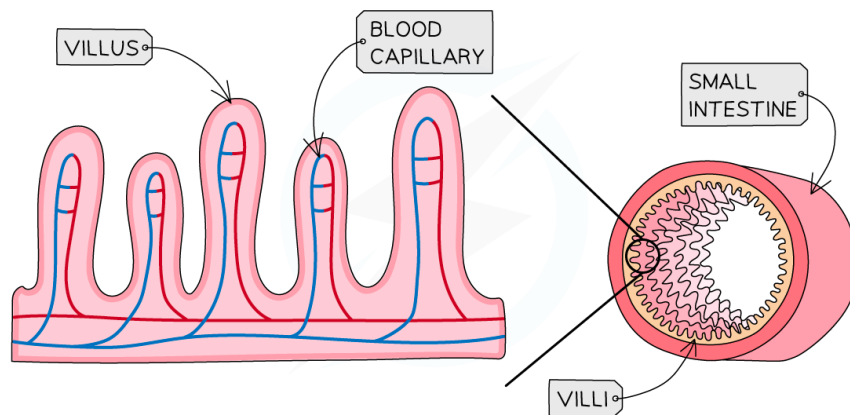
Digestive Organs

Organ	Function
Mouth	Teeth break food into smaller pieces (mechanical digestion). Enzymes in saliva start to break down food (chemical digestion).
Oesophagus	Tube that connects the mouth to the stomach. Contractions force the food down; this process is called peristalsis.
Stomach	Churning breaks down food (mechanical digestion). Enzymes also break down food (chemical digestion). Hydrochloric acid kills bacteria.
Small Intestine	Digestion finishes here, more enzymes are released to help digestion. Digested food moves through the walls of the small intestine, into the blood (absorption). The walls of the small intestine are lined with villi to increase surface area.
Large Intestine	Water is absorbed and the remaining material produces the faeces which is stored in the rectum and removed through the anus.



Adaptations of the Small Intestine

Digested food is absorbed into the blood once it reaches the **small intestine**:



- The surface of the small intestine wall is folded, and has projections called *villi*. The cells that cover each villi have projections called *microvilli*.
- Both villi and microvilli **increase the surface area** over which digested food can be absorbed.
- The walls of the villi are only **one cell thick** – this provides a short diffusion pathway.
- The villi are well supplied with a **network of blood capillaries** that transport digested food **away** from the small intestine in the blood.