Food Groups

Which group?	Found in	Function in the body
Protein	Meat, fish, poultry, eggs, nuts, legumes (dried beans, peas and lentils), milk, yoghurt & cheese.	Essential for growth and repair and maintenance of a healthy body. Makes up part of the structure of cells in the body.
Carbohydrate	Bread, cereals, rice, pasta, noodles, vegetables, legumes, fruit, milk and yoghurt.	To provide energy
Saturated Fats	Butter, lard, coconut oil, palm oil, ghee, cream, milk, cheese and ice-cream.	To provide energy. Also to store energy in the body and to insulate it against the cold.
Monounsaturated Fats	Olive oil, peanut oil, canola oil and peanut butter.	
Polyunsaturated Fats	Sunflower and other vegetable oils, nut oils including almond and walnut.	
Vitamins and minerals	Vitamin C- fruit and vegetables Vitamin B- cereals, fruit and vegetables Iron- leafy vegetables and red meat	Needed in small amounts for normal growth and health every day. Essential for the body to help carbohydrate foods to release energy. Important for other body structures.

Yr 8 Biology Unit 1

Food Labels and Energy

- Food **stores** energy, which when eaten is transferred to the consumer.
- Each individual requires a **specific** amount of food, depending on their energy requirements.
- Energy is measured in joules (J) or kilojoules (KJ). An older unit for measuring food energy is the calorie- one calorie equals 4.2 J.

Sample Label for Macaroni and Cheese

Start Here

Limit these Nutrients

Get Enough of these Nutrients

Footnote

Nutrition Facts

Serving Size 1 cup (228g)
Servings Per Container 2

Amount Per Serving

Calories 250 — Calories from Fat 110

% Daily Value*

Total Fat 12g	18%
Saturated Fat 3g	15%
Trans Fat 1.5g	
Cholesterol 30mg	10%
Sodium 470mg	20%
Total Carbohydrate 31g	10%
Dietary Fiber 0g	0%
Sugars 5g	
Protein 5g	
Vitamin A	4%
Vitamin C	2%
Calcium	20%
Iron	4%

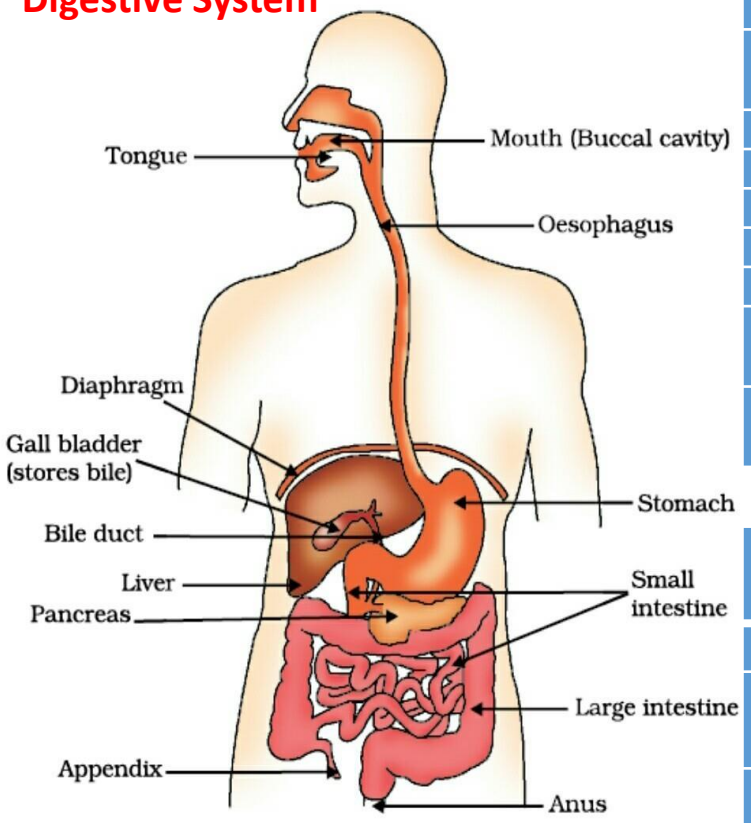
* Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs:

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

The amount of energy we need varies.
This can be due to some of the following factors:
1- age (the amount of energy we need tends to increase as we approach adulthood
2- activity levels
3- pregnancy

Age in years	Daily energy req (Kj)
0 (newborn)	2,000
2	5,000
6	7,500
13 (girl)	9,000
13 (boy)	11,000
16 (girl)	9,000
16 (boy)	12,000

Digestive System



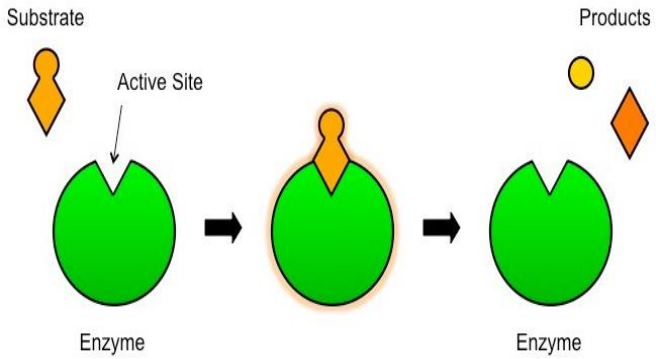
Structure	Function
Mouth	Where food enters the body and digestion begins
Salivary glands	Produces saliva which contains the digestive enzyme amylase
Oesophagus	Muscular tube which moves ingested food to the stomach
Stomach	Muscular organ where digestion continues
Pancreas	Produces digestive enzymes
Liver	Produces bile
Gall bladder	Stores bile before releasing it into the small intestine
Small intestine	Where food is mixed with more digestive enzymes and bile. Then digested food is absorbed into the blood.
Large intestine	Where water, minerals and remaining nutrients are absorbed.

Enzyme type	Where produced	Substrate	Product	Optimum pH
Amylase	Salivary glands	Starch	Maltose	pH7
Protease	Stomach, pancreas	Protein	Amino acids	pH2
Lipase	Pancreas	Lipids (fats & oils)	Fatty acids & glycerol	pH8

Respiration

Energy is needed for life processes such as:
Growth and repair
Movement
Control of body temperature
Respiration is a chemical reaction that happens in all living cells. It is the way that energy is released from glucose.

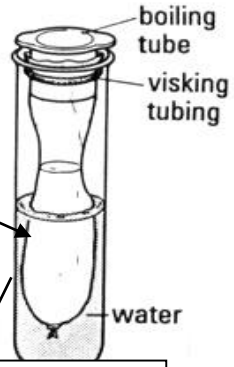
Aerobic respiration



Enzymes are biological catalysts- this means they speed up reactions without being used up. An enzyme works on the substrate, forming products. An enzyme will only work on one substrate. The enzyme and substrate collide to form enzyme-substrate complexes. The substrates are broken down and the products released. The enzyme is free to work again. This is known as the lock and key theory.

Model gut experiment

Starch ONLY



Take some water out and put in two test tubes

1

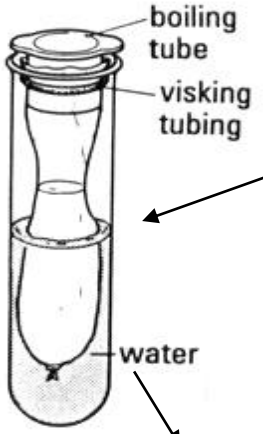
2

Add IODINE

Add BENEDICTS

Explanation- No starch outside the visking tubing. It is too large to pass through.

Explanation- No sugar present in the water as no enzyme has been added to break down the starch.



Starch AND enzyme

Put both in a water bath at 35°C for 30 minutes

After 30 minutes...

Take some water out and put in two test tubes

3

4

Add IODINE

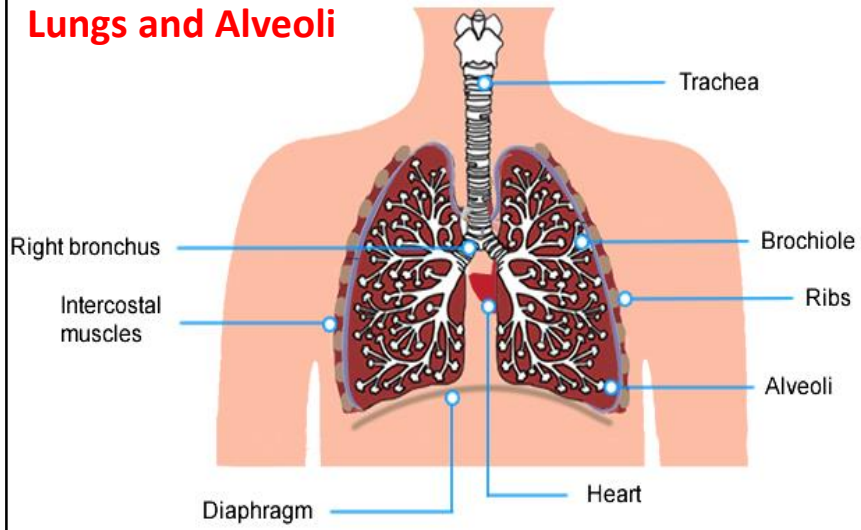
Add BENEDICTS

Explanation- No starch present as it is too large to pass through the visking tubing.

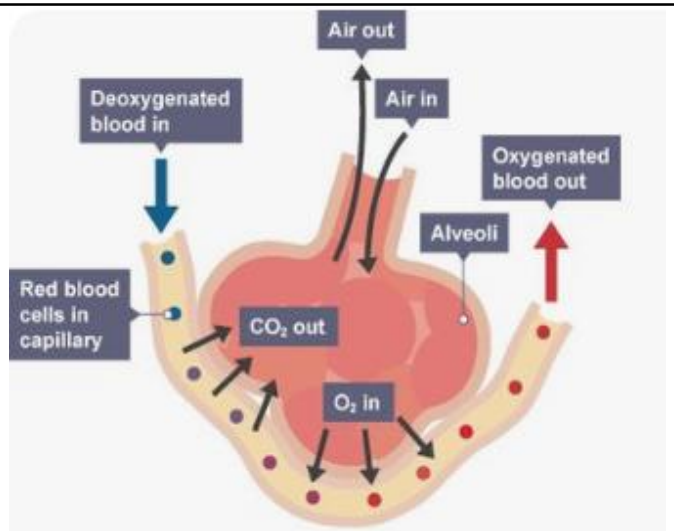
Explanation- The amylase enzyme has break down the starch into glucose. Glucose is small enough to pass through the visking tubing.

Note- to test for starch we use iodine. Iodine is a yellow/brown coloured solution. If added to starch it turns blue/black.
To test for sugar we use benedict's solution. Benedict's is a blue solution. When added to sugar and heated it will turn either green, yellow, orange & red.

Lungs and Alveoli



Alveoli are good at gas exchange because they have:
- a large surface area.
- moist surface which speed up diffusion.
- very thin walls (just one cell thick) which speeds up diffusion.
- lots of blood capillaries to carry the gasses.



Ventilation

	Inhaling	Exhaling
Diaphragm	Contracts and moves downwards	Relaxes and moves upwards
Intercostal muscles	Contract, moving the ribs upwards and outwards	Relax, letting the ribs move downwards and inwards
Volume of ribcage	Increases	Decreases
Pressure inside the chest	Decreases below atmospheric pressure	Increases above atmospheric pressure
Movement if air	Moves into the lungs	Moves out of the lungs