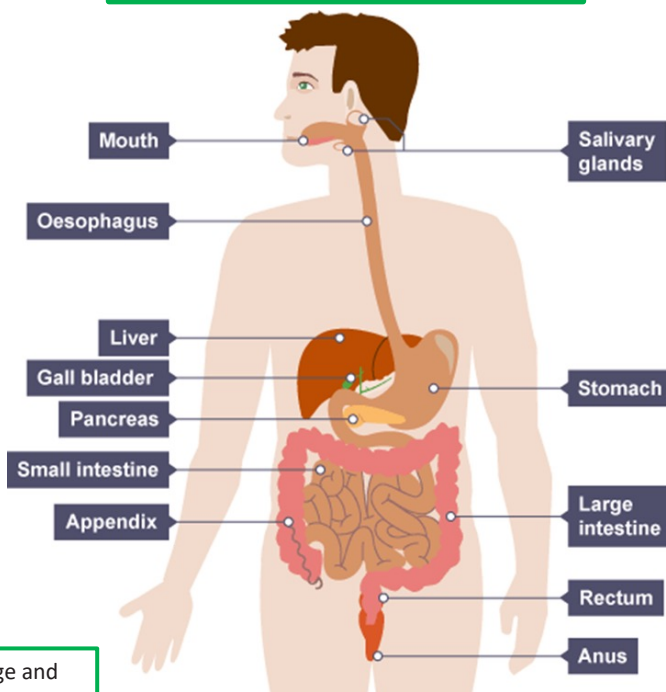


Heath and the Human Body



The Digestive System

Organ	Function
Mouth	Digestion of food starts in the mouth. Teeth break down the food and mix it with the enzymes in saliva.
Oesophagus	This is a thin tube that connects the mouth to the stomach.
Liver	This releases a chemical called bile into the intestines. Bile breaks down lipids in the food.
Stomach	This is a muscular bag which mixes food and drink with acid.
Pancreas	This releases enzymes into the intestines which break down carbohydrates, protein and lipids in food.
Small intestine	Here, carbohydrates, proteins and lipids digest. The nutrients produced are then absorbed into the blood.
Large intestine	Food which cannot be broken down - mainly fibre - passes into the large intestine. Water is absorbed into the blood.
Rectum	Any undigested food passes into the rectum where it is stored as faeces.
Anus	This is the opening at the very end of the digestive system through which faeces leaves the body.

A **drug** is a substance that has an effect on the body.

Drug	Type of Drug	Legality	Effects on behaviour	Effect on health
Alcohol	Depressant	Legal (for over-18s)	Slows thinking, reduces inhibitions.	Short term effects include hangovers, while long term effects include liver disease.
Caffeine	Stimulant	Legal	Alert, and if too much taken then nervousness and restlessness.	Too much causes lack of sleep.
Paracetamol	Painkiller	Legal	None	Reduces pain without addressing the cause.
Cocaine, MDMA, meth	Stimulant	Illegal	Feel euphoric, energetic, talkative, touch.	Anxiety, panic, seizures, headaches, stomach cramps, aggression and paranoia.
LSD, ketamine	Hallucinogens	Illegal	Change the way people see, hear, taste, smell or feel, and affect mood and thought.	Can cause flashbacks, depression and anxiety.

Enzymes are the **biological catalysts** needed to make this happen quickly enough to be useful. Enzymes are not living things. They are special proteins that can break large molecules into small soluble molecules. Different types of enzymes can break down different nutrients:

Food	Enzyme	Product
Starch	Carbohydrase	Glucose
Protein	Protease	Amino Acids
Fat	Lipase	Fatty Acids & Glycerol

Nutrient	Use in the body	Good sources
Carbohydrate	Source of chemical energy, (used in respiration).	Cereals, pasta, rice and potatoes
Protein	To provide materials to make new cells and to repair damaged tissues, such as muscles.	Fish, meat, eggs, beans, pulses and dairy products
Lipids (fats and oils)	To provide energy. Also to store energy in the body and insulate it against the cold.	Butter, oil and nuts
Minerals	These include iron, used to transport oxygen in the blood, and calcium, used in making bones and teeth.	Salt, milk (for calcium) and liver (for iron)
Vitamins	Used in many processes, e.g. vitamin K helps blood clot and vitamin C stops illness.	Fruit, vegetables, dairy foods
Dietary fibre	Helps to keep the food moving through the digestive system.	Vegetables and bran
Water	Keeps you hydrated, chemical reactions in cells take place in water and the blood transports substances dissolved in water.	Water, fruit juice, milk

People need a different amount of energy depending on factors such as: biological sex, age and your amount of daily activity (exercise). Food labels show how much energy the food provides.

Imbalanced diets and deficiency diseases.

- Too little food can cause someone to be underweight and potentially cause starvation. This can eventually lead to death
- Too much food can cause someone to be overweight and potentially cause obesity. This causes an increase risk of other health issues such as heart disease, cancer, stroke.
- A balanced diet contains the right amount of all the nutrients needed for healthy growth. If you have too little of a nutrient, you have a **deficiency** in that nutrient.

Food sample	Name of test (Reagent)	Method	Initial colour	Colour of positive result
Glucose (sugar)	Benedict's	Add Benedict's reagent to the food and heat	Blue	Brick red precipitate
Starch	Iodine	Add iodine reagent to the food.	Yellow/Brown	Blue-black
Protein	Biuret	Add Biuret reagent to the food.	Blue	Pink/purple
Fat	Ethanol	Add ethanol to the food to dissolve the fat then add water.	Colourless	White emulsion

Smoking

Harmful Substance	Effect
Tar	Tar causes cancer of the lungs, mouth and throat. It coats the inside of the lungs, including the alveoli, causing coughing. It damages the alveoli, making it more difficult for gas exchange to happen.
Smoke	Cells in the lining of the trachea, bronchi and bronchioles produce sticky mucus. This traps dirt and microbes. Cells with tiny hair-like parts, called cilia then move the mucus out of the lungs. However, hot smoke and tar from smoking damages the cilia. As a result of this, smokers cough to move the mucus and are more likely to get bronchitis.
Nicotine	Nicotine is addictive. It causes a smoker to want more cigarettes. Nicotine also increases the heart rate and blood pressure, and makes blood vessels narrower than normal. This can lead to heart disease.
Carbon monoxide	Carbon monoxide is a gas that takes the place of oxygen in red blood cells. This reduces the amount of oxygen that the blood can carry. It means that the circulatory system has to work harder, causing heart disease.

The effects of smoking on an unborn baby.

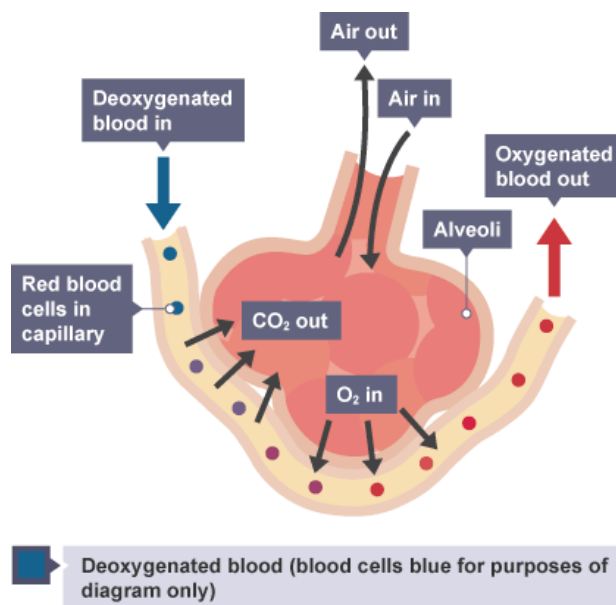
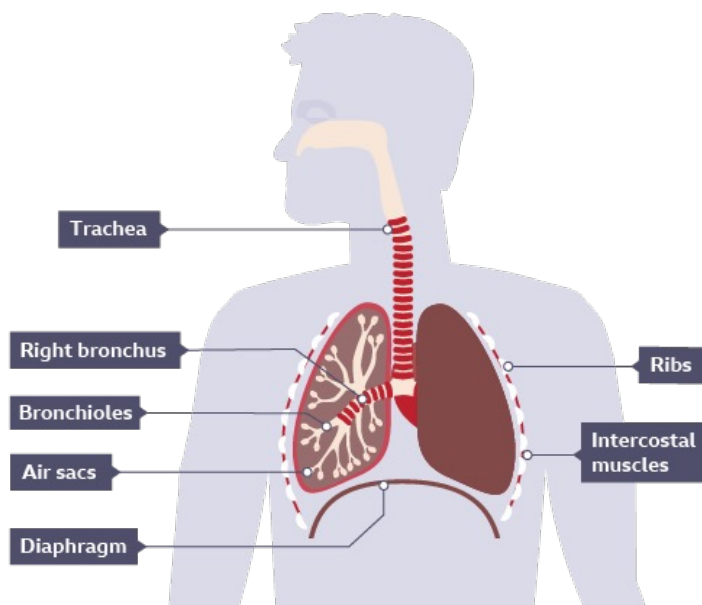
When a pregnant woman smokes, the chemicals diffuse into her bloodstream. That blood flows to the placenta and umbilical cord. The chemicals then diffuse into the foetus' blood. Carbon monoxide restricts the supply of oxygen that's essential for the foetus' healthy growth and development. Babies born to mothers that smoke, often have a lower birth weight, a greater risk of still birth and miscarriage.

Gas exchange

Part of the gas exchange system	Function
Trachea	This is also called the windpipe. This tube runs from the mouth, down the throat towards the lungs. It is lined with rings of cartilage which keep it open at all times.
Bronchus	The trachea splits into a left and right bronchus (plural: bronchi), each leads to a lung.
Bronchiole	Each bronchus splits again and again into thousands of smaller tubes called bronchioles which take the air deeper into the lungs.
Alveoli	At the ends of bronchioles are tiny air sacs called alveoli. Here oxygen moves into the blood and carbon dioxide moves out.
Intercostal muscles	These muscles run between the ribs and form the chest wall. They contract and relax with the diaphragm when a person breathes.
Diaphragm	The diaphragm is a dome-shaped, flat sheet of muscle under the lungs. It contracts and relaxes with the intercostal muscles during breathing.

How are the alveoli adapted for gas exchange?

- Alveoli have a very **large surface area** to enable more diffusion of oxygen **into** the blood from the alveoli, and more carbon dioxide **out** of the blood into the alveoli.
- They are only one cell thick so that the diffusion distance is small.
- They have lots of **blood capillaries** to ensure a good blood supply to maintain concentration gradients of oxygen and carbon dioxide.
- They have moist surfaces for gases to dissolve in to form a solution to pass through the cell membrane.



Breathing

	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 of air	Moves into the lungs	Moves out of the lungs