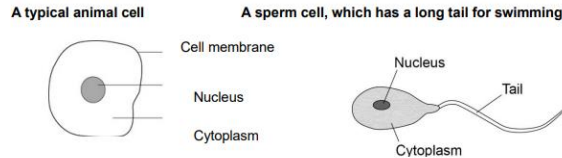


Cells

Sticky knowledge

- Cells are the basic building blocks of all living organisms.
- Most animals and plants are made up of millions of different cells.
- Most human cells are like most other animal cells and have the following parts: Cell membrane, nucleus and cytoplasm.
- Cells may be specialised through different shapes and sizes to carry out a particular function, eg sperm cells, nerve cells and muscle cells.



- Red blood cells are shaped like a doughnut and have no nucleus to maximise their size so they can absorb lots of oxygen.



- Nerve cells transmit electrical signals.



nerve cell

Key vocabulary

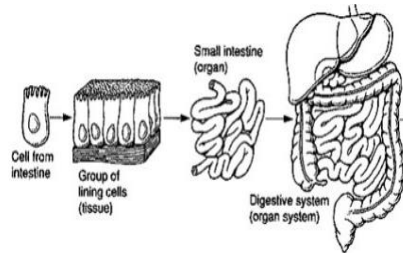
Cell	The unit of a living organism, contains parts to carry out life processes
Cell membrane	Surrounds the cell and controls the passage of substances in and out of cells
Cytoplasm	Where most chemical reactions take place
Nucleus	Controls the activities of the cells and contains the genetic material
Genetic (genetic material)	Controls inherited characteristics such as eye colour.

Entry Level - The human body (Both single and double award).

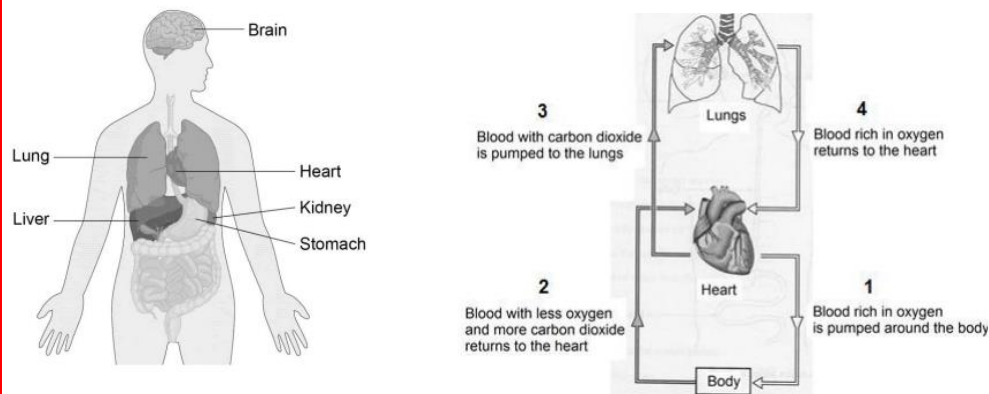
Tissues and organs

Sticky knowledge

- A tissue is a group of cells with a similar structure and function.
- Organs are made up of tissues performing similar functions.
- Organs are organised into organ systems which work together.



- The human circulatory system consists of the heart, which pumps blood around the body, which transports oxygen, proteins and other chemical substances around the body.
- The blood contains both red and white blood cells.



Key vocabulary

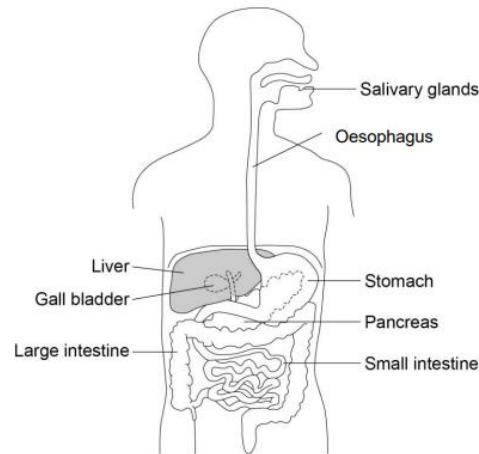
Brain	Part of the nervous system that processes information
Lungs	Organs of the body that exchange gases; when we breathe air into our lungs, oxygen from the air is absorbed into our blood. Carbon dioxide is also released from the blood back into the lungs then it is breathed out.
Heart	The organ that pumps blood around the body
Liver	Removes toxins, can store energy from food and produces bile
Kidneys	Filters the blood and produces urine
Stomach	Muscular bag that breaks down the food; acidic conditions.
Organ	A group of different tissues working together to carry out a job
Reproductive organs	The testes in males and the ovaries in females
Tissue	Group of cells of one type
White blood cells	Help us to fight diseases.
Blood	A fluid that our heart pumps around our whole body
Carbon dioxide	A waste gas produced as a result of respiration
Oxygen	A gas found in the air that we use in respiration.

Entry Level - The human body (Both single and double award).

The digestive system

Sticky knowledge

- The human digestive system contains a variety of organs: - salivary glands - stomach - liver - gall bladder - pancreas - small intestine - large intestine.
- Food travels along the digestive system, in the order: 'mouth', 'oesophagus', 'stomach', 'small and large intestines'. - -The mouth is where food is taken in and digestion starts.
 - The oesophagus is a tube that carries food from the mouth to the stomach.
 - The stomach is where digestion continues
 - The small intestine is where useful products are absorbed into the blood.
- Enzymes are biological catalysts that speed up the process of digestion by converting food into soluble substances that can be absorbed into the bloodstream.



Key vocabulary

Absorbed	'Taken in'; useful products from digestion are absorbed through the wall of the intestine into the blood.
Digestion	The process of breaking down food into simple substances that can be absorbed into the blood.
Enzymes	Substances that speed up the chemical reactions of digestion.
Gall bladder	A storage organ that helps in the digestion of fat by storing bile.
Oesophagus	A tube connecting the mouth to the stomach.
Small intestine	Upper part of the intestine where digestion is completed and nutrients are absorbed by the blood.
Large intestine	Lower part of the intestine where water is absorbed and where faeces are formed
Liver	Removes toxins, can store energy from food and produces bile.
Pancreas	A large gland behind the stomach; it releases digestive enzymes into the small intestine and releases hormones into the bloodstream.
Saliva	A watery liquid produced in the mouth; it lubricates the food, making it easier to swallow, and starts the process of digestion.
Salivary glands	Produce saliva in your mouth.
Stomach	A sac where food is mixed with acidic juices to start the digestion of protein and kill microorganisms.

Entry Level - The human body (Both single and double award).

Respiration and healthy living choices

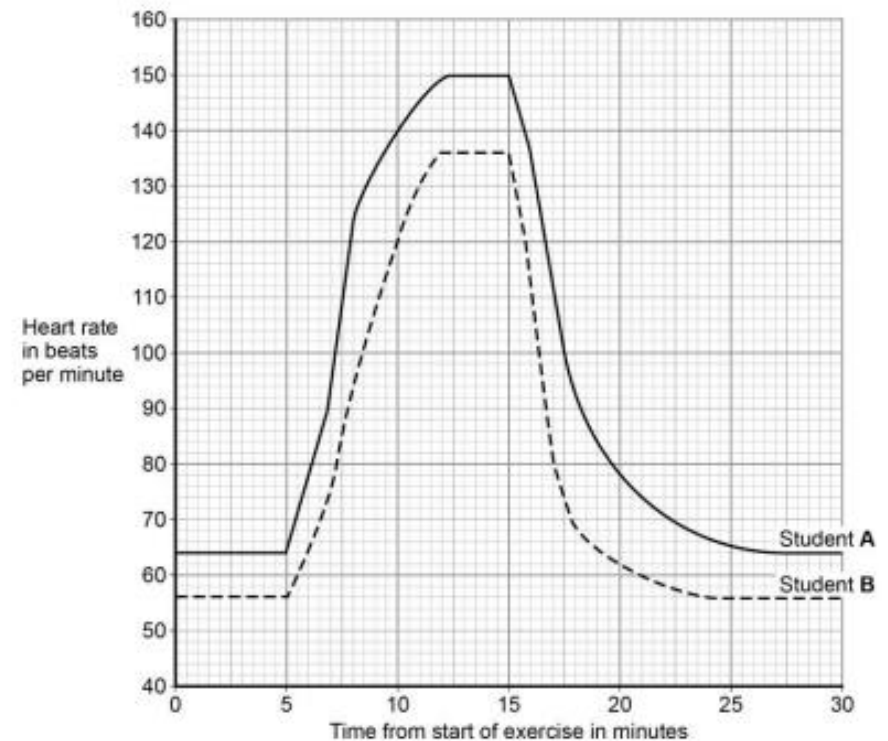
Sticky knowledge

- Respiration releases the energy needed for living processes and is represented by the equation: $\text{Glucose} + \text{oxygen} \rightarrow \text{carbon dioxide} + \text{water} (+ \text{energy})$
- Glucose is derived from the diet and that carbon dioxide and oxygen gases are exchanged through the lungs.
- Lifestyle can have an effect on people's health eg the factors of diet and exercise are linked to obesity and diabetes; smoking to cancer; and alcohol to liver and brain function.
- A healthy diet contains the right balance of the different foods you need and the right amount of energy.
- People who exercise regularly are usually fitter than people who take little exercise.
- Graphs that show how exercise causes the pulse rate to change.



Key vocabulary

Pulse	A rhythmical throbbing that can be felt in an artery; it is caused by the heart pumping blood through the artery
Pulse rate	The number of pulses that can be felt in a certain time
Respiration	How living things use oxygen to release energy from food



Entry Level - The human body (Both single and double award).

How the infectious diseases make us ill.

Sticky knowledge

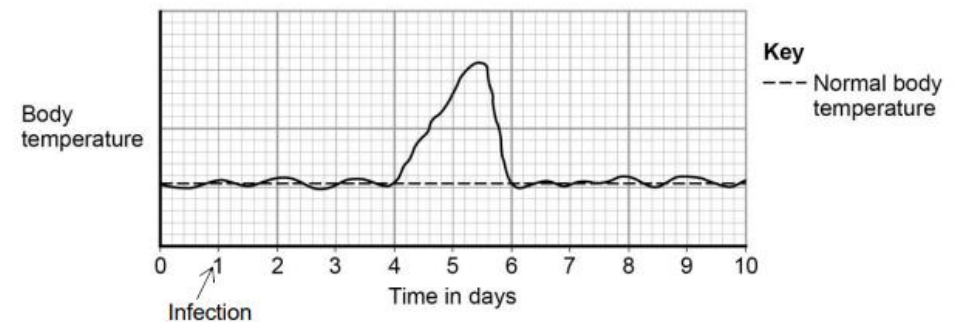
- Infectious (communicable) diseases are caused by microorganisms called pathogens such as a virus, bacteria, parasite, or fungus
- Pathogens may reproduce rapidly inside the body
- Bacteria produce poisons (toxins) that make us feel ill.
- Viruses damage the cells in which they reproduce and cause harm.
- Some bacteria are useful to us, but others can make us ill.



Key vocabulary

Pathogen	Simple microscopic single-celled organisms; some are good for the body, others can cause illness and disease.
Bacteria	A microorganism that causes disease.
Toxin	A type of poison.
Virus	The smallest type of microorganism; they can live inside body cells and cause disease.

The diagram below shows the type of graph that students may be required to interpret regarding body temperature and infection.

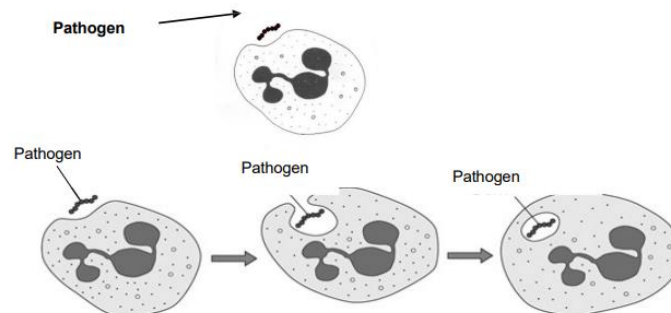


Entry Level - The human body (Both single and double award).

How the body fights infection.

Sticky knowledge

- There are different types of blood cells: white blood cells and red blood cells.
- White cells in the blood help us to fight disease and are part of the body's natural defence mechanism.
- White blood cells ingest pathogens and produce antibodies.
- A Vaccination involves introducing small quantities of dead or inactive forms of a pathogen into the body to stimulate the white blood cells to produce antibodies so that if the same pathogen re-enters the body, antibodies can be produced rapidly
- Viral infections are hard to treat because viruses live inside the body's cells.



Key vocabulary

White blood cell	One of the different types of cell found in the blood; they help us to fight diseases
Antibody	A substance produced by the body to fight disease. Antibodies are proteins that are produced by the immune system
Ingest	Consume
Vaccination	Injection of a killed microbe in order to stimulate the immune system to protect us against the microbe, so preventing a disease

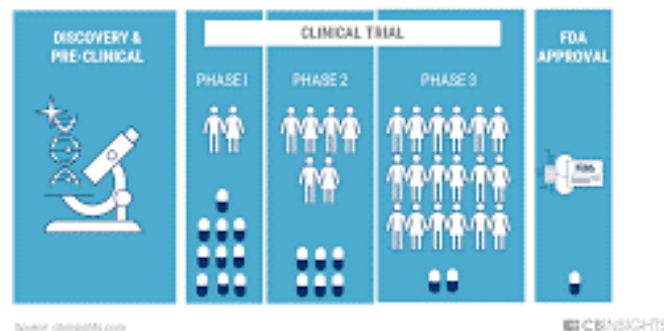
Entry Level - The human body (Both single and double award).

Medical drugs

Sticky knowledge

- Medical drugs are developed and tested before being used to relieve illness or disease.
- Drugs change the chemical processes in people's bodies.
- People may become dependent or addicted to the drugs and suffer withdrawal symptoms without them.
- Antibiotics, including penicillin, are medicines that help to cure bacterial disease by killing infective bacteria inside the body, but cannot be used to kill viruses.

 Bringing a drug to market is a drawn-out process



Key vocabulary

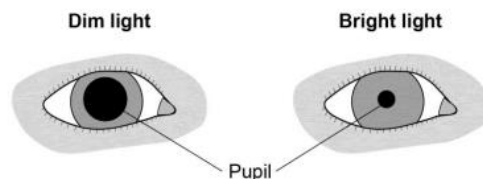
Addictive	An addictive substance is one that your body becomes dependent on: once you start taking it, you want more and it is difficult to give up.
Antibiotic	A drug that acts on bacteria.
Drug	A substance not normally found in the body that is taken to bring about a particular effect.
Penicillin	Type of antibiotic; it was one of the first ones to be produced.

Entry Level - The human body (Both single and double award).

How is the body coordinated?

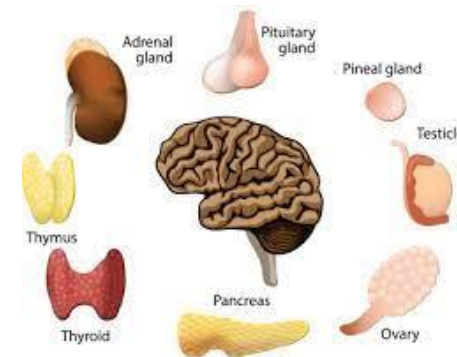
Sticky knowledge

- The human body has automatic control systems, which may involve nervous responses or chemical responses coordinated by hormones.
- Reflex actions are automatic and rapid. Examples include the response of the pupil in the eyes to bright light, and the knee jerk reaction.
- Hormones are chemical substances that act as 'messengers' around the body, they are released by glands in the body and travel round to another part, where they have an effect on target organs.
- Different glands make different hormones.
- A reflex action is one that happens automatically that we have no control over. A good example of a reflex action is blinking when something is about to go in your eye.
- The brain is not involved in reflex actions.



Key vocabulary

Action	Any response which our body carries out, such as kicking, walking or blinking.
Automatic	Means that a response happens without thinking about it; we cannot control automatic reactions.
Coordinated	If processes are coordinated it means that they are working together for the same purpose.
Glands	These are organs in the body that make hormones.
Hormones	This is a chemical messenger that carries a signal from one cell (or group of cells) to another via the blood.
Reflex action	A reflex is an automatic response of the body; it usually happens very quickly and it often helps to protect our body.
Secreted	When hormones are released into the blood, they are said to be secreted.
Target Organ	This is an organ in the body that receives the hormone and produces a response.

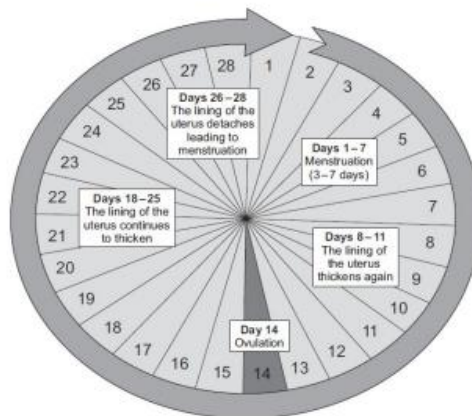


Entry Level - The human body (Both single and double award).

Hormones and the menstrual cycle

Sticky knowledge

- Several hormones are involved in the menstrual cycle of woman.
- The release of eggs is controlled by hormones in a woman's body.
- Oestrogen and progesterone are two hormones involved in the menstrual cycle. • An egg is released from the ovary; it travels down the fallopian tube where it can be fertilised by a sperm.
- If the egg is fertilised it embeds itself in the lining of the womb where it grows and develops.
- If the egg is not fertilised the lining of the womb breaks down. This is known as menstruation or a period.
- The menstrual cycle lasts approximately 28 days. • An egg is released around day 14.



Key vocabulary

Egg	The female reproductive cell; when fertilised it can develop into an embryo
Glands	Organs in the body that make hormones
Hormone	A chemical messenger that carries a signal from one cell (or group of cells) to another via the blood.
Menstrual cycle	This is a recurring series of changes that occur in a woman's body; these changes are brought about by hormones and are linked to reproduction.
Secreted	When hormones are released into the blood they are said to be secreted.

Entry Level - The human body (Both single and double award).

Hormones and fertility

Sticky knowledge

- The uses of hormones in controlling fertility include: - giving oral contraceptives that contain hormones to inhibit eggs from maturing - giving 'fertility drugs' to stimulate eggs so that they mature
- Women have different levels of fertility and is affected by the presence of certain hormones in the blood.
- Fertility may be increased by the woman being given certain hormone treatments.
- Fertility may be reduced by the woman taking oral contraceptives containing another type of hormone.
- One of the effects of fertility treatment is that it may result in multiple births.
- Multiple conceptions can sometimes increase the risk of complications in pregnancy and childbirth, and may lead to premature or underweight babies.

Key vocabulary

Contraceptive	A method designed to prevent the fertilisation of an egg.
Fertility	The natural ability to produce another living being; if a woman is fertile it means that she has the ability to produce a baby.
Inhibit	To prevent.
Mature	To grow to full size.
Oral	Taken into the body through the mouth.
Stimulate	To provide a signal that will produce a response; eggs will not grow to maturity until they receive a signal to do so

