

Definitions and Concepts for CAIE Biology IGCSE

Topic 9: Transport in Animals

*Definitions in **bold** are for supplement only*

Angioplasty - The use of a catheter to insert a small deflated balloon into a blocked or narrowed artery. Once in place, the balloon is inflated, widening the artery. In some cases a stent may be inserted into the lumen.

Aorta - The artery that takes oxygenated blood away from the heart to the body.

Arteriole - A type of blood vessel that connects the arteries and capillaries.

Artery - A type of blood vessel that carries blood away from the heart to the tissues, under high pressure. The walls of the arteries contain thick layers of smooth muscle and elastic fibres.

Aspirin - A drug used to treat coronary heart disease by preventing the formation of blood clots in the arteries.

Atria - The two upper chambers of the heart that receive blood from the veins and pump blood into the ventricles. **The muscular walls of the atria are thinner than that of the ventricles.**

Atrioventricular (AV) valves - The valves found between the atria and ventricles. They prevent the backflow of blood from the ventricles into the atria. There are two types of AV valves: bicuspid and tricuspid.

Bicuspid valves - The atrioventricular valves found between the left atrium and left ventricle.

Blood - A tissue containing red blood cells, white blood cells, platelets and plasma.

Blood clotting - A defence mechanism that prevents excessive blood loss and the entry of harmful microorganisms. It involves platelets and the conversion of fibrinogen to fibrin to form a mesh over the wound.

By-pass surgery - A surgical procedure involving the use of a blood vessel from another region of the body (e.g. leg, arm) to divert blood around a blockage in the coronary artery.

Capillaries - Thin, narrow blood vessels that connect the arteries and veins. They are the site of exchange of substances between the blood and the tissues.

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Circulatory system - The transport system in mammals consisting of a pump, blood vessels and valves.

Coronary arteries - The arteries that supply the heart muscle with food and oxygen.

Coronary heart disease - A disease caused by the build-up of fatty deposits inside the coronary arteries, narrowing them and reducing blood flow to the heart tissue. Risk factors include a diet high in saturated fats, stress, lack of exercise, smoking, age, genetic predisposition and gender.

Double circulatory system - A circulatory system found in mammals in which the blood flows through the heart twice in two circuits. Blood is pumped from the heart to the lungs before returning to the heart. It is then pumped around the body, after which it returns to the heart again.

Electrocardiogram (ECG) - A technique used to measure the spread of electrical activity through the heart by measuring tiny changes in the skin's electrical conductivity. This produces a trace which is used to detect abnormalities in heart rhythm.

Heart sounds - The sounds ('lub-dup') of the heart valves opening and closing. The 'lub' represents the closure of the valves between the atria and ventricles. The 'dup' signifies the closure of the valves between the ventricles and the arteries.

Lactic acid - The product of anaerobic respiration in animal cells. Lactic acid build-up inhibits anaerobic respiration and results in cramp and fatigue.

Lymph - Modified tissue fluid that drains into the lymphatic system.

Lymphatics - See 'Lymphatic vessels'.

Lymphatic system - A collection of organs and tissues which drain lymph from the blood and which are involved in immunity.

Lymphatic vessels - Thin-walled vessels that carry lymph through the lymphatic system. They have valves ensuring the flow of lymph in one direction only. Also known as lymphatics.

Lymph nodes - Swellings located at intervals in the lymphatic vessels that store and release lymphocytes into the lymph.

Lymphocyte - A type of white blood cell that produces antibodies specific to a particular antigen.

Phagocyte - A type of white blood cell that engulfs pathogens and digests them in a process known as phagocytosis.

Phagocytosis - The process by which white blood cells (**phagocytes**) engulf and destroy pathogens.



Plasma - The main component of the blood that carries red blood cells. It is a yellow liquid containing blood cells, soluble nutrients, ions, carbon dioxide and hormones.

Platelets - Small fragments of cells that are involved in blood clotting.

Pulmonary arteries - The arteries that carry deoxygenated blood away from the heart to the lungs.

Pulmonary veins - The veins that carry oxygenated blood from the lungs to the heart.

Pulse rate - The number of pulses felt in an artery (e.g. radial artery) per minute.

Red blood cell - A type of blood cell that is anucleate and biconcave. It contains haemoglobin which enables the transport of oxygen and carbon dioxide to and from the tissues.

Renal arteries - Blood vessels that carry oxygenated blood to the kidneys.

Renal veins - Blood vessels that drain the kidneys.

Semilunar valves - A pair of valves found between the ventricles and arteries. They prevent the backflow of blood from the arteries into the ventricles.

Septum - The wall of muscle separating the left side from the right side of the heart. It prevents oxygenated and deoxygenated blood from mixing.

Shunt vessels - Blood vessels that directly link the arterioles to the venules, allowing blood to bypass the capillaries. They can control blood flow via constriction and dilation.

Single circulatory system - A circulatory system in which the blood travels one circuit. Blood flows through the heart and is pumped around the body before returning to the heart. Single circulatory systems are found in fish.

Stent - A small, hollow tube that can be surgically implanted into the lumen of arteries to keep them open.

Tissue fluid - The fluid that surrounds the cells of animals. It has the same composition as plasma but does not contain red blood cells or plasma proteins.

Tricuspid valves - The atrioventricular valves found between the right atrium and right ventricle.

Valves - Structures in the heart that prevent the backflow of blood.

Vein - A type of blood vessel that carries blood towards the heart under low pressure. It has a wide lumen, smooth inner lining and valves. The walls of the veins contain some smooth muscle and little elastic fibre.

Vena cava - The vein that returns deoxygenated blood to the heart from the body.



Ventricles - The two lower chambers of the heart that receive blood from the atria and expel blood into the arteries. **The muscular wall of the left ventricle is thicker than that of the right ventricle.**

Venule - A type of blood vessel that connects the capillaries and veins.

White blood cells - Cells of the immune system that protect the body from invading pathogens. They play a role in phagocytosis and in the production of antibodies. **Two types: phagocytes and lymphocytes.**

