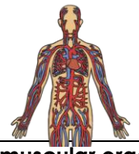
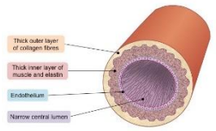
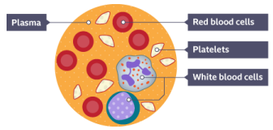
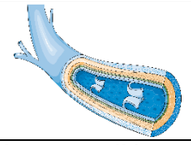
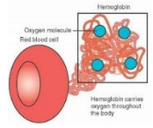
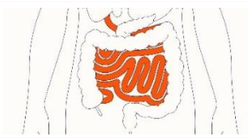
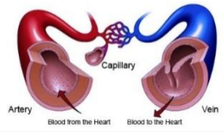
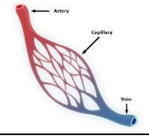
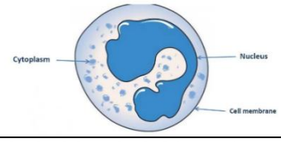
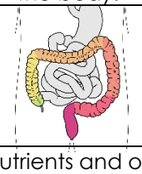
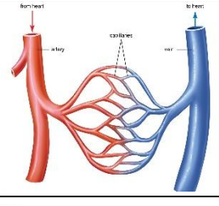
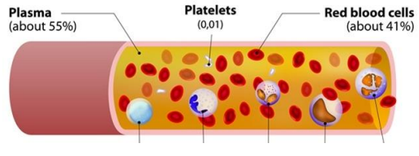
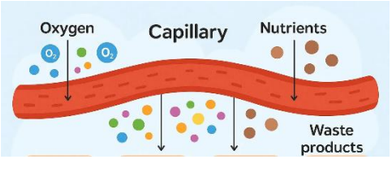
Year 6: Animals, including Humans – Science Knowledge Organiser (Biology)

Enquiry Journey:

1) What is the circulatory system and what does it do?	2) How does exercise affect our pulse rate, and how does it recover afterwards?	3) How are blood vessels designed to do different jobs?	4) How do the different components of blood help the body?	5) How do nutrients and water get around our bodies?
The circulatory system consists of the **heart, blood and blood vessels**.	**Pulse rate is the number of pulses detected in one minute** and can be used to measure heart rate.	**Arteries carry blood away from the heart** and have thick, muscular, elastic walls to withstand high blood pressure.	Blood contains four main components: **red blood cells, white blood cells, platelets and plasma.**	**Digestion breaks food down into smaller substances** that can be absorbed by the body.
				
The heart is a **muscular organ** that pumps blood around the body.	During exercise, working muscles need **more oxygen and glucose to release energy through respiration.**	**Veins carry blood towards the heart**, and many contain valves that help prevent blood flowing backwards.	Red blood cells **contain haemoglobin**, which binds to oxygen and transports it from the lungs to body cells.	Most nutrient absorption takes place through the wall of the **small intestine**, which has a large surface area.
				
Arteries carry blood away from the heart, veins carry blood towards the heart, and capillaries allow substances to pass between blood and body tissues.	The heart usually **beats faster during exercise** to supply working muscles with more oxygen and nutrients.	**Capillaries have very thin walls** that allow substances to pass between the blood and body tissues.	**White blood cells help defend the body against pathogens** that can cause disease.	Water is absorbed mainly in the small intestine, with further absorption in the large intestine; the blood transports water around the body.
				
Blood transports **oxygen, nutrients and other substances** to cells and carries some waste products away.	After exercise, pulse rate **gradually decreases** towards its resting level, and repeated measurements allow us to observe recovery over time.	**The different structures of blood vessels are adapted to their roles** in transporting blood and exchanging substances with body cells.	**Platelets help blood clot** to reduce blood loss, while **plasma transports blood cells** and dissolved substances.	Blood carries nutrients and oxygen to cells, where they are used in respiration to release energy, and transports waste products away.
				
Scientific Lens: Identifying and classifying	**Scientific Lens:** Observing Over Time	**Scientific Lens:** Comparative and Fair Testing	**Scientific Lens:** Identifying and Classifying	**Scientific Lens:** Research using Secondary Sources
Key Vocabulary: • **Circulatory system** – The system that transports blood around the body. • **Arteries** – Blood vessels that carry blood away from the heart. • **Veins** – Blood vessels that carry blood towards the heart. • **Capillaries** – Tiny blood vessels where substances pass between blood and cells.	**Key Vocabulary:** • **Pulse** – The beat felt as blood moves through an artery. • **Oxygen** – A gas needed by cells to release energy. • **Glucose** – A simple sugar used by cells to release energy. • **Respiration** – The process cells use to release energy from glucose.	**Key Vocabulary:** • **Artery** – A blood vessel that carries blood away from the heart. • **Vein** – A blood vessel that carries blood towards the heart. • **Capillary** – A tiny blood vessel where substances pass between the blood and body tissues. • **Valve** – A structure that helps prevent blood from flowing backwards.	**Key Vocabulary:** • **Red blood cells** – Cells that carry oxygen around the body. • **White blood cells** – Cells that help defend the body against pathogens. • **Platelets** – Tiny blood components that help blood clot. • **Plasma** – The liquid part of blood that transports dissolved substances. • **Haemoglobin** – A substance in red blood cells that binds to oxygen.	**Key Vocabulary:** • **Nutrients** – Substances the body needs for energy, growth and repair. • **Absorption** – The movement of nutrients into the bloodstream. • **Small intestine** – The organ where most nutrient absorption takes place. • **Soluble** – Able to dissolve in a liquid. • **Bloodstream** – The flow of blood through the body's blood vessels.

Enquiry Journey:

6) How do our lifestyle choices affect our circulatory system?	7) Which choices help keep our circulatory system healthy, and what evidence supports this?			
A balanced diet provides nutrients needed for the body to function, grow and repair itself.	Regular **physical activity helps** strengthen the heart and supports healthy circulation.			
				
Regular physical activity helps maintain a healthy heart and supports the functioning of the circulatory system.	A balanced diet, avoiding smoking and limiting alcohol can help reduce the risk of circulatory disease.			
 				
Smoking damages blood vessels and increase the risk of circulatory diseases, while **drugs can affect the** body in different ways depending on the substance and how it is used.	**Scientific evidence**, including research findings and investigation results, can help us evaluate how lifestyle choices affect circulatory health.			
 				
Circulatory health is influenced by **several interacting factors**, including diet, physical activity and other lifestyle choices.	A strong scientific argument uses a **clear claim, relevant evidence and scientific reasoning** to justify conclusions about maintaining a healthy circulatory system.			
				
Scientific Lens:  Pattern Seeking	**Scientific Lens:**  Scientific Argumentation			
Key Vocabulary: • **Balanced diet** – Eating a variety of foods in suitable amounts. • **Lifestyle** – The way a person lives, including their daily habits. • **Physical activity** – Any movement that uses the body's muscles. • **Drugs** – Substances that change how the body functions.	**Key Vocabulary:** • **Cardiovascular health** – The health of the heart and blood vessels. • **Blood pressure** – The force of blood pushing against artery walls. • **Cholesterol** – A fatty substance in the blood needed by the body, but high levels can increase health risks			