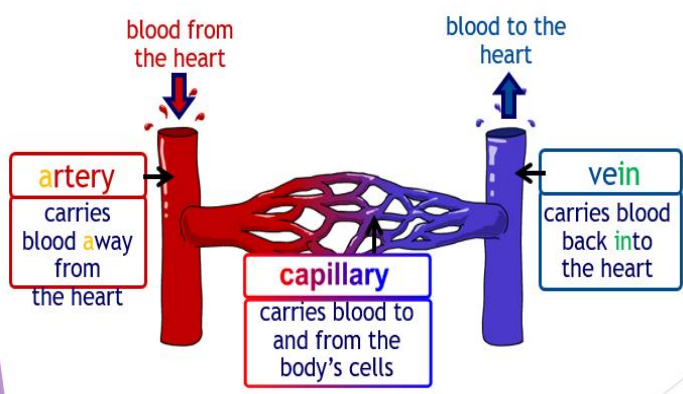


Artery:
Main is Aorta
Smooth muscles layer
Carries O₂ at high pressure away from heart

Capillary:
Single cell thick
For gaseous exchange at muscles and alveoli

Vein:
Main is Vena Cava
Thin layer
Valves to prevent backflow
Carries deoxygenated blood at low pressure back to the heart

Blood Vessels

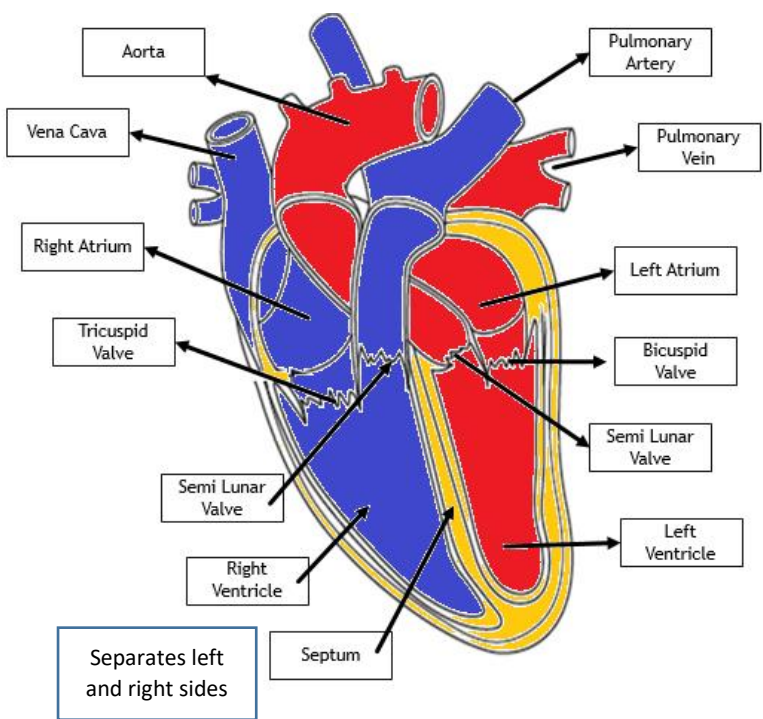
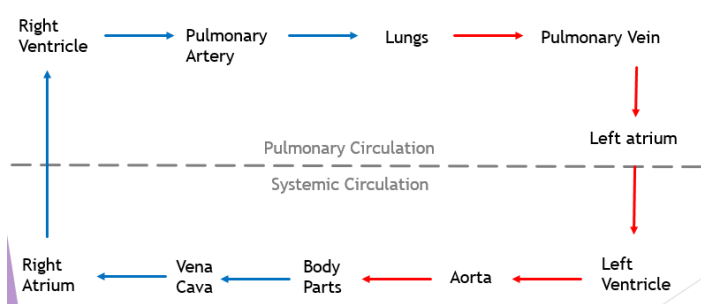


Cardiovascular system

The heart works as a **double circulatory system**

Pulmonary: Transports O₂ blood from heart to the lungs

Systemic: Transports deoxygenated blood from the heart to the body



Heart rate-
The number of times the heart beats **per minute**

Stroke volume-
The amount of blood that leaves the heart **per beat**

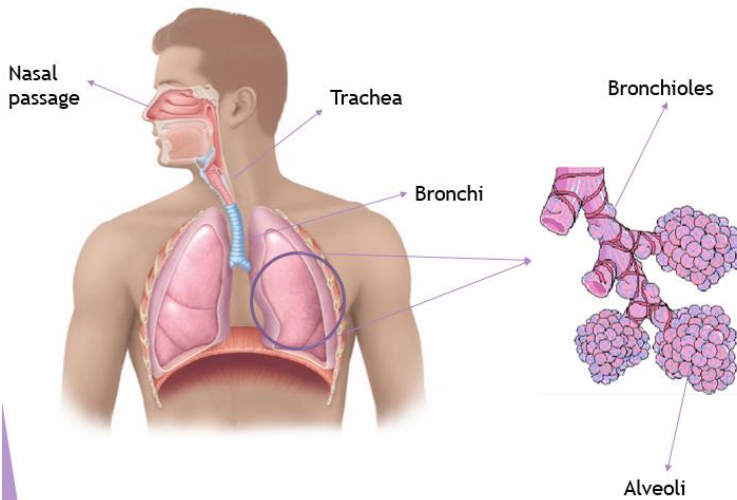
Cardiac output-
The amount of blood leaving the heart **per minute**
Heart rate x Stroke volume

Red blood cells:
Carries oxygen

White blood cells:
Fights infection

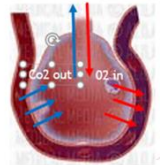
Respiratory system

Pathway of air



Gaseous exchange

- ▶ Takes place at alveoli
- ▶ Where carbon dioxide from deoxygenated blood is exchanged for oxygen to fill red blood cells
- ▶ Simply is movement of oxygen and carbon dioxide between the alveoli and bloodstream
- ▶ Gases move from area of high concentration to low



Respiratory muscles

During inspiration

Structure	Function	Effect
Diaphragm flattens downwards Ribs move up and out Lungs move outwards	Increase volume of the chest cavity Gases move from high pressure to low	Air is drawn into the lungs

During expiration

Structure	Function	Effect
Diaphragm relaxes upwards Ribs are lowered Area in lung decreases	Pressure within lungs becomes greater	Air is forced out of lungs

Breathing rate

The number of inspirations or expirations taken each minute
(breaths per minute)

Tidal volume

The volume of **air** inspired or expired in **one breath** measured in millilitres

Minute ventilation

Volume of **air** inspired or expired each **minute** measured in litres per minute

Aerobic vs anaerobic exercise

	Aerobic	Anaerobic
Description	Raises heart and breathing rate over sustained time	Pushes performer to the max and causes being out of breath and fatigued
Energy production	With oxygen	Without oxygen
Intensity	Low to moderate	High
Duration	Long	Short
Example	Jogging	Sprinting
By-product	Carbon dioxide and water	Lactic acid