



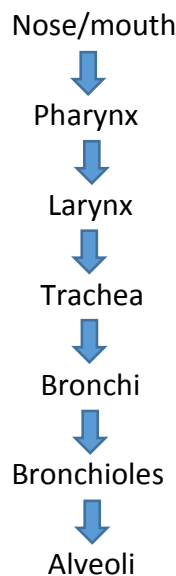
Respiratory System

Function of the respiratory system

- The lungs are located in the chest cavity and their function is to intake oxygen and remove carbon dioxide from the body.

Structure of the respiratory system

The order of the passage of oxygen into the body (inhalation/inspiration) is: -



- Alveoli are covered by capillaries which allow oxygen to diffuse into the blood and carbon dioxide in to the lungs to be exhaled.
- The **diaphragm** and **intercostal muscles** are the main muscles involved in breathing.

Gaseous exchange

Gaseous exchange, also known as diffusion is the process of gases moving from an area of high concentration to an area of low concentration. This occurs in the lungs where oxygen diffuses into the bloodstream from the respiratory tract. It also takes place in the capillaries in the muscles where oxygen diffuses from the blood to the tissues, at the same time carbon dioxide diffuses from the tissues into the blood in the arteries to be transported back to the lungs via the heart.



Circulatory System

Function of the heart

- The heart is a muscular pump made up of cardiac muscle and is positioned behind the sternum, just left of centre. Its function is to pump blood around the body.

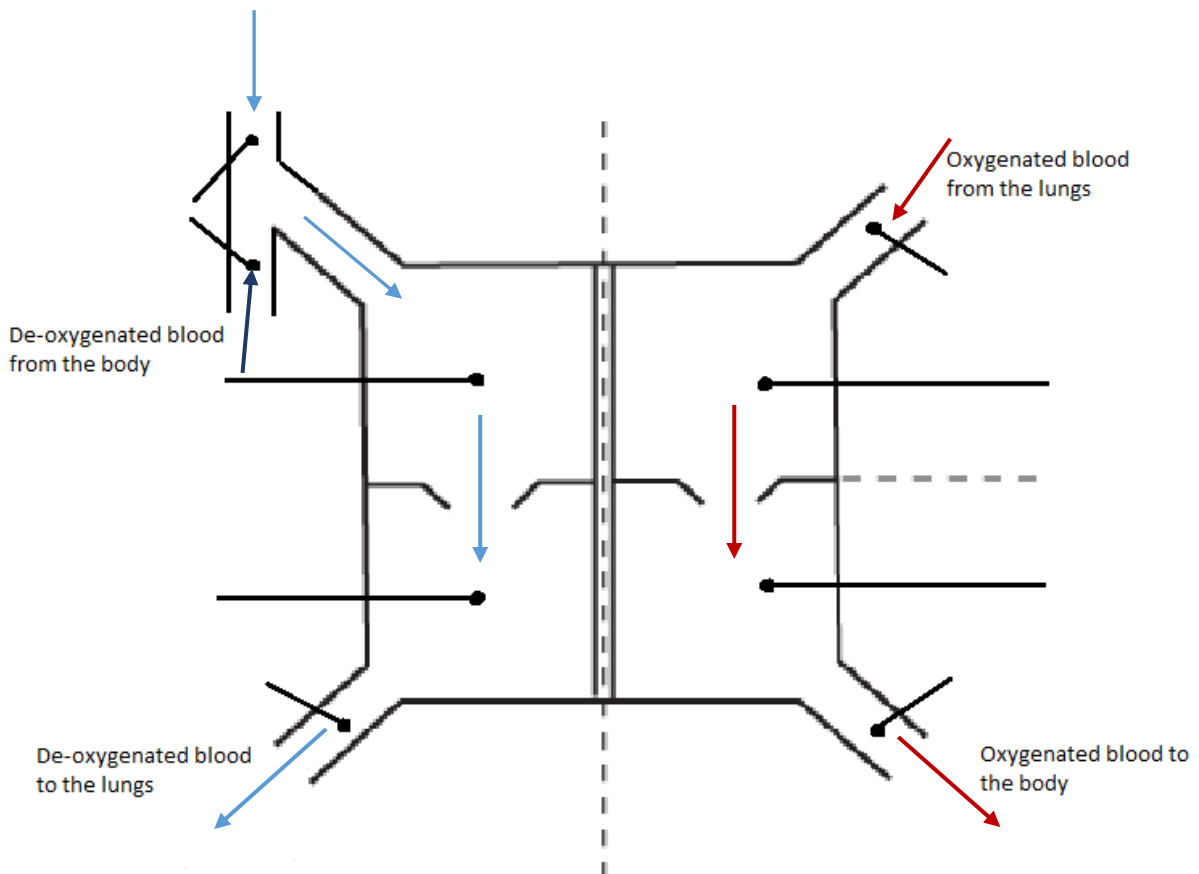
Structure of the heart

- The heart is made up of four chambers – *left atrium, right atrium, left ventricle and right ventricle* and four major vessels – *pulmonary vein, aorta, pulmonary artery and vena cava*.
- The valve between the left atrium and left ventricle is the bicuspid valve – it is an atrio ventricular valve (AV)
- The valve between the right atrium and right ventricle is the tricuspid valve – it is an atrio ventricular valve (AV)
- The valve between the left ventricle and aorta is the aortic valve and is a semi lunar valve
- The valve between the right ventricle and pulmonary artery is the pulmonary valve and is a semi lunar valve



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TASK 1: Label the four chambers and four vessels on the diagram below. (Remember, whenever you see a diagram of the heart imagine the person it belongs to is facing you!)



Circulation

Systemic circulation – this is the flow of blood from the left side of the heart to all parts of the body and then back to the right side of the heart.

Pulmonary circulation – this is the flow of blood from the right side of the heart to the lungs then back to the left side of the heart.

TIP - The word pulmonary always relates to
the lungs!



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Blood vessels

- **Arteries** have thick muscular walls and carry blood away from the heart
- **Veins** contain non-return valves to prevent the backflow of blood and always carry blood towards the heart
- **Capillaries** are the smallest of all blood vessels (only one cell thick) to allow for the exchange of gases during the process of diffusion

Blood pressure is a measure of the amount of force that is applied to the walls of the arteries when the heart pumps.

- Systolic blood pressure is the measurement of force that blood applies to the artery walls during a contraction of the heart and is always the first figure given in a blood pressure reading.
- Diastolic blood pressure is the measurement of blood on the artery walls between contractions.

Optimal blood pressure is 120/80 mmHg.

Blood Pressure Category	Systolic mm Hg (upper #)		Diastolic mm Hg (lower #)
Normal	less than 120	and	less than 80
Prehypertension	120 – 139	or	80 – 89
High Blood Pressure (Hypertension) Stage 1	140 – 159	or	90 – 99
High Blood Pressure (Hypertension) Stage 2	160 or higher	or	100 or higher
Hypertensive Crisis (Emergency care needed)	Higher than 180	or	Higher than 110

Components of blood and their roles

- **Red blood cells:** transport oxygen around the body
- **White blood cells:** fight infection
- **Platelets:** responsible for clotting the blood when needed
- **Plasma:** liquid proportion of blood



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TASK 2: Using the words in red below list in order the passage of oxygen and carbon dioxide through the main structures of the respiratory and circulatory systems.

Bronchi, Left atrium, Capillaries (in the muscles), Mouth\nnose, Arteries, Trachea, Pharynx, Alveoli, Aorta, Bronchioles, Vena cava, Larynx, Right atrium, Capillaries (in the lungs), Venules, Arterioles, Pharynx, Veins, Alveoli, Larynx, Mouth\nnose, Bronchioles, Trachea, Right ventricle, Bronchi, Left ventricle, Pulmonary artery, Capillaries (in the lungs). Pulmonary vein

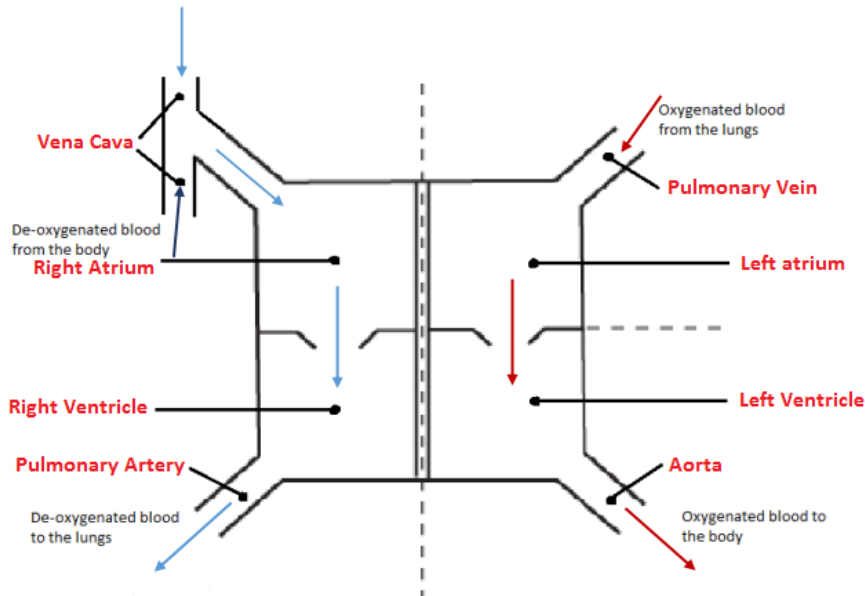
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- 2.
- 3.
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- LUNGS [6.
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- HEART [10.
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- 12.
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- LUNGS [22.
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- 24.
- 25.
- 26.
- 27.
- 28.
- 29.



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Answers to tasks

Task 1:



Task 2: 1. Nose/mouth 2. Pharynx, 3. Larynx, 4. Trachea, 5. Bronchi, 6. Bronchioles, 7. Alveoli, 8. Capillaries (lungs) 9. Pulmonary vein, 10. Left atrium, 11. Left ventricle, 12. Aorta, 13. Arteries, 14. Arterioles, 15. Capillaries (in the muscle tissues), 16. Venules, 17. Veins, 18. Vena cava, 19. Right atrium, 20. Right ventricle, 21. Pulmonary artery, 22. Capillaries (lungs), 23. Alveoli, 24. Bronchioles, 25. Bronchi, 26. Trachea, 27. Larynx, 28. Pharynx, 29. Nose/mouth