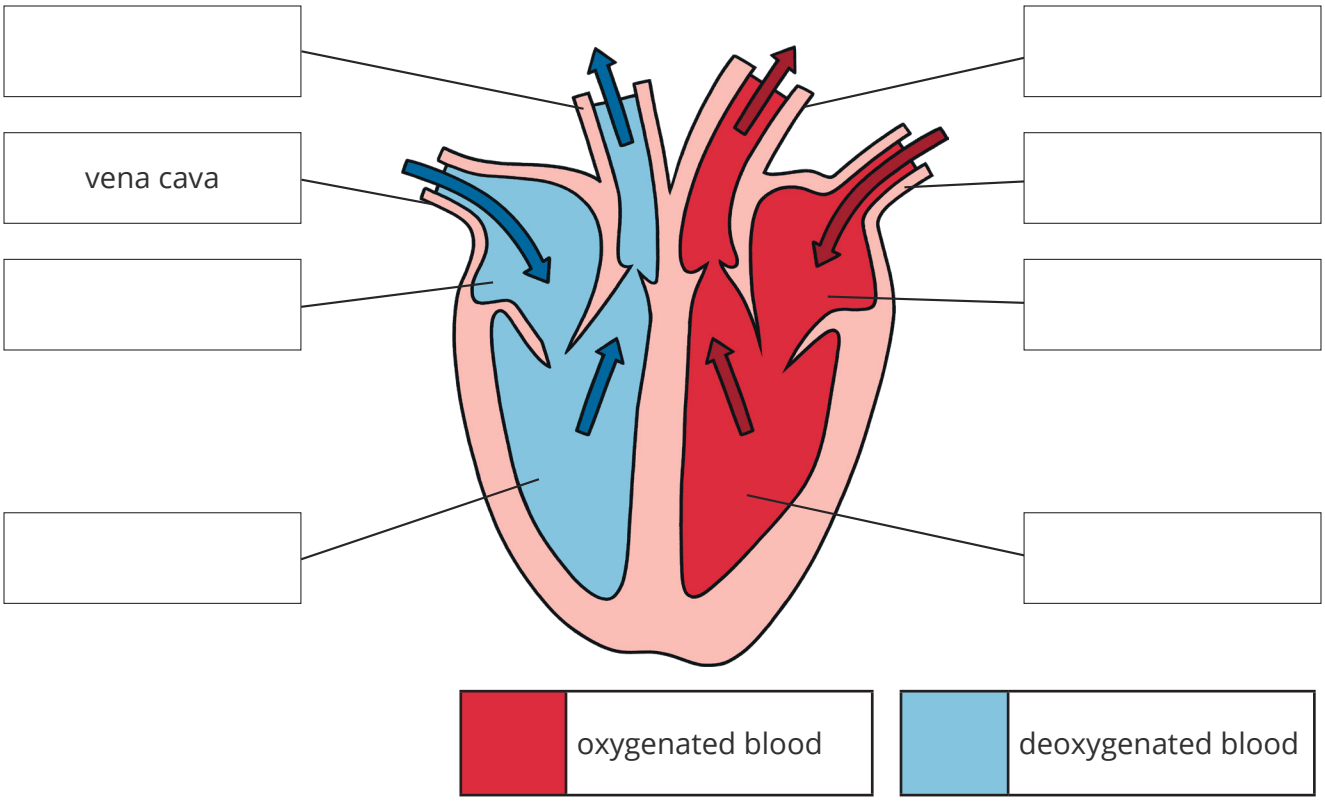
The Heart

The heart is part of the circulatory system. Humans have a double circulatory system; the heart pumps the blood through two circuits. The right side of the heart pumps blood to the lungs and the left side of the heart pumps blood to the rest of the body.

Blood enters the heart through the **vena cava** and passes into the **right atrium**, then into the **right ventricle**. The muscles in the right ventricle wall push the blood through the **pulmonary artery**, which carries the blood to the lungs. At the same time, blood from the lungs enters the heart through the **pulmonary vein**, passes through the **left atrium** and into the **left ventricle**. Muscles in the left ventricle wall push the blood through the **aorta**, which takes the blood to the rest of the body.

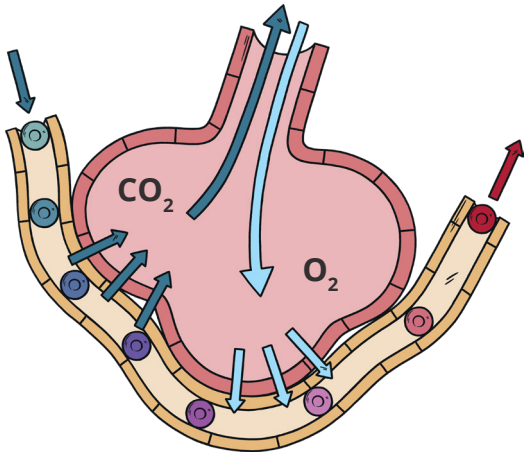
1. Label the parts of the heart in the diagram below.



2. Explain why the muscle wall on the left side of the heart is thicker than the wall on the right side of the heart.

3. Explain why the heart has valves between the chambers.

Blood arriving at the right side of the heart is **deoxygenated**. The right side of the heart pumps blood to the lungs. Blood returning to the left side of the heart is **oxygenated**. The diagram below shows blood passing through a capillary close to an alveolus in the lungs.



4. Use the diagram to describe the process of gas exchange in the lungs. Try to include all the key words in the box.

alveoli	carbon dioxide	diffuses	exhaled
inhaled	oxygen	red blood cells	

The left side of the heart pumps oxygenated blood to the rest of the body.

5. Describe what happens to the substances in the blood as it passes close to the body tissues. Try to include all the key words in the box.

carbon dioxide	diffuses	glucose	energy
muscle	oxygen	respiration	

The Heart **Answers**

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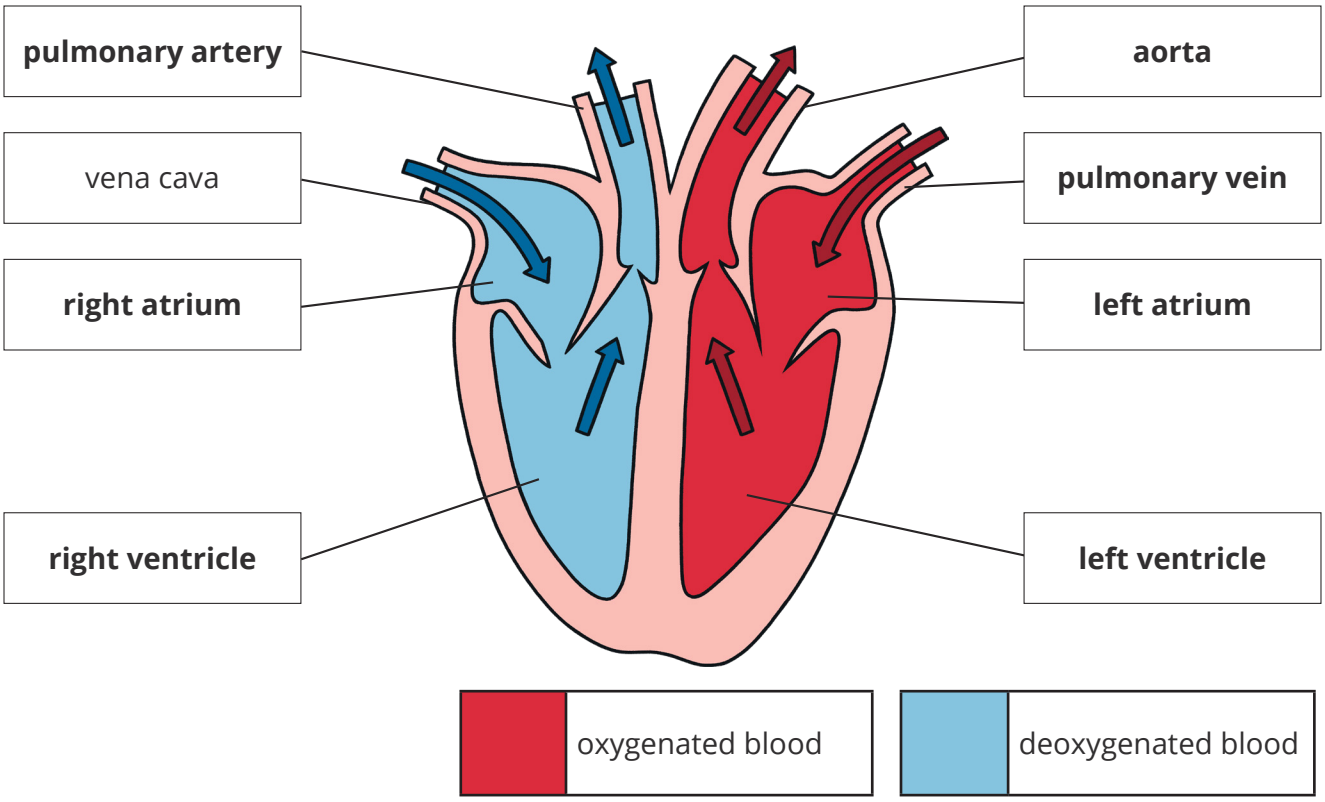

2. Explain why the muscle wall on the left side of the heart is thicker than the wall on the right side of the heart.

The left side of the heart needs to put the blood under higher pressure than the right side in order to pump it a greater distance around the body.

3. Explain why the heart has valves between the chambers.

The valves prevent blood flowing backwards, to keep blood flowing in one direction around the circulatory system.

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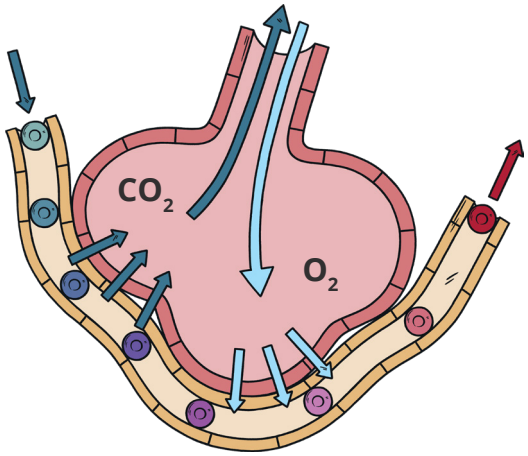

4. Use the diagram to describe the process of gas exchange in the lungs. Try to include all the key words in the box.

alveoli	carbon dioxide	diffuses	exhaled
inhaled	oxygen	red blood cells	

The air that is inhaled into the lungs contains a high concentration of oxygen. Oxygen diffuses from the air in the alveoli into the red blood cells in the blood. Carbon dioxide diffuses from the blood into the air in the alveoli to be exhaled.

The left side of the heart pumps oxygenated blood to the rest of the body.

5. Describe what happens to the substances in the blood as it passes close to the body tissues. Try to include all the key words in the box.

carbon dioxide	diffuses	glucose	energy
muscle	oxygen	respiration	

Glucose and oxygen diffuse from the blood into the muscle cells, where they are used for respiration to release energy. Carbon dioxide and other waste products diffuse from the muscle cells into the blood to be returned to the heart.

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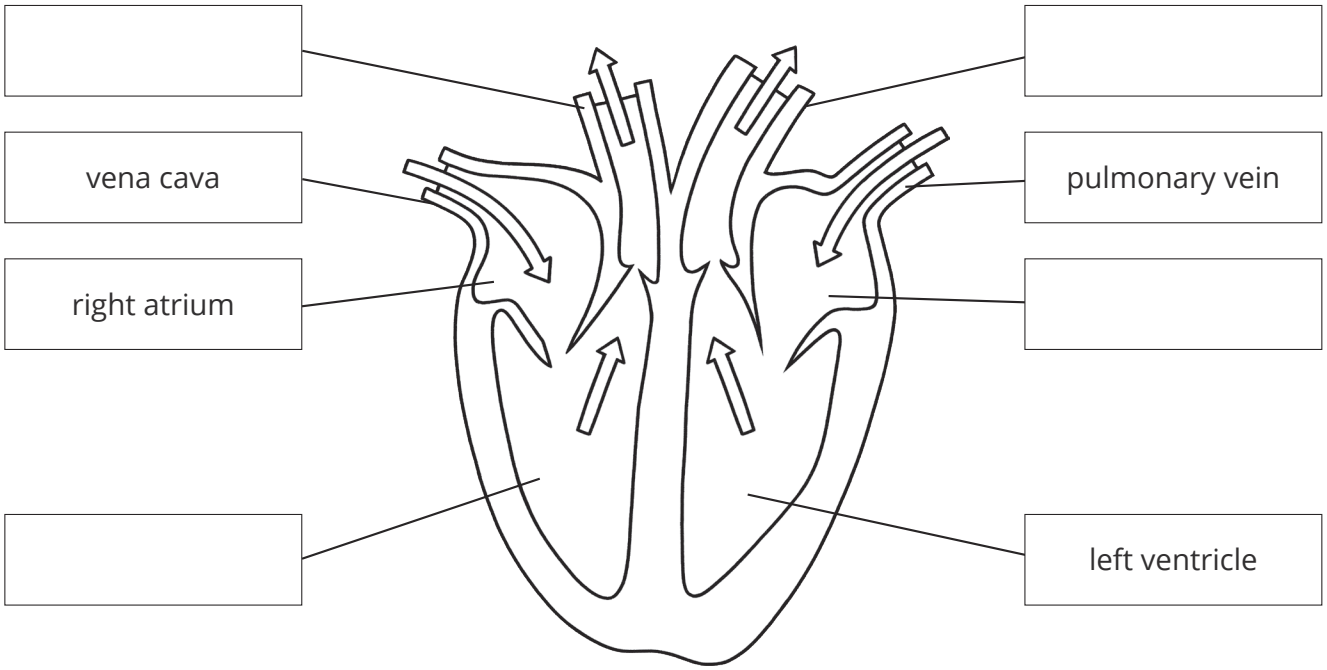
When you look at a diagram of the heart, the right side of the heart will be on the left of the page and the left side of the heart is on the right of the page.

1. Label the parts of the heart in the diagram below. Choose answers from the box.

aorta	left atrium	pulmonary artery	right ventricle



	deoxygenated blood

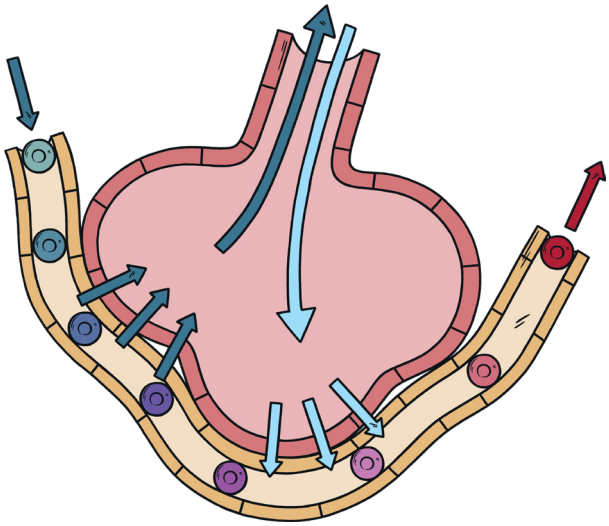
	oxygenated blood

When blood reaches the lungs, it becomes **oxygenated**. Oxygen diffuses from the air in the lungs into the red blood cells in the blood. Carbon dioxide diffuses from the blood into the lungs to be exhaled.

2. On the diagram above, colour the four chambers of the heart to show whether they carry oxygenated blood or deoxygenated blood. Show the colours in the key.

Blood arriving at the right side of the heart is deoxygenated. The right side of the heart pumps blood to the lungs. Blood returning to the left side of the heart is oxygenated.

The diagram shows blood passing through a capillary close to an alveolus in the lungs.



3. Which gas diffuses from the air in the alveoli into the blood?

Tick **one** box.

carbon dioxide ☐ glucose ☐ oxygen ☐

4. Which gas diffuses from the blood to the air in the alveoli?

Tick **one** box.

carbon dioxide ☐ glucose ☐ oxygen ☐

The left side of the heart pumps oxygenated blood to the rest of the body.

5. Complete the sentences to describe what happens to the substances in the blood as it passes close to the body tissues.

carbon dioxide	diffuse	glucose	muscle	oxygen	respiration

_____ and _____ diffuse from the blood into the _____ cells, where they are used for _____ to release energy. _____ and other waste products _____ from the muscle cells into the blood to be returned to the heart.

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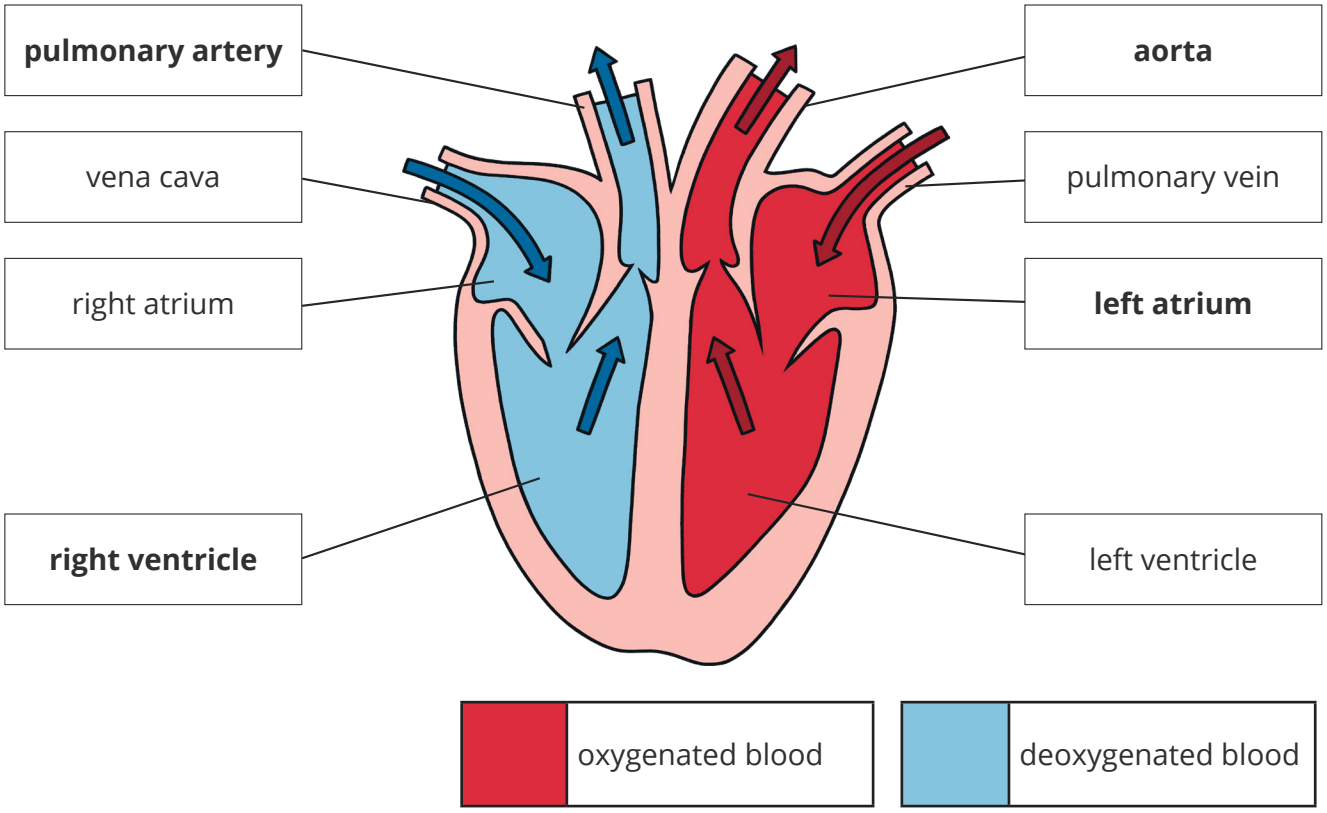

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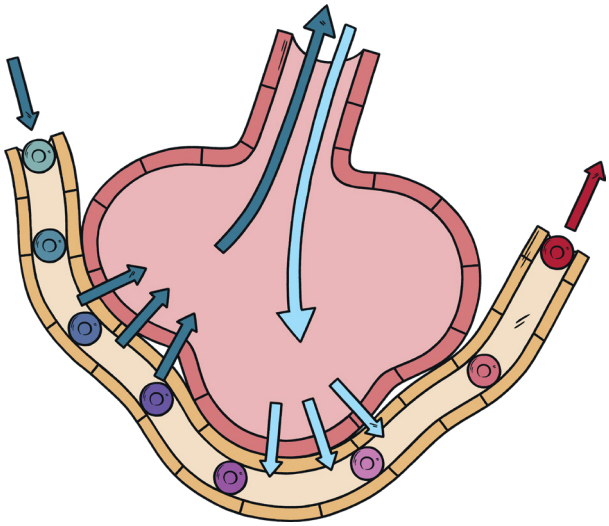

3. Which gas diffuses from the air in the alveoli into the blood?

Tick **one** box.

carbon dioxide		glucose		oxygen	✓

4. Which gas diffuses from the blood to the air in the alveoli?

Tick **one** box.

carbon dioxide	✓	glucose		oxygen	

The left side of the heart pumps oxygenated blood to the rest of the body.

5 .Complete the sentences to describe what happens to the substances in the blood as it passes close to the body tissues.

carbon dioxide	diffuse	glucose	muscle	oxygen	respiration

Glucose and **oxygen** diffuse from the blood into the **muscle** cells, where they are used for **respiration** to release energy. **Carbon dioxide** and other waste products **diffuse** from the muscle cells into the blood to be returned to the heart.