

Heart Circulation

GCSE Biology · Written to the shared content for AQA, Edexcel and OCR

Name _____ Class _____ Date _____

1. Worked example

Explain why the human circulatory system is called a double circulatory system. (2 marks)

Step 1 · Two circuits

Blood passes through the heart twice for each complete circuit of the body.

Step 2 · Name them

One circuit goes from the right ventricle to the lungs and back; the other from the left ventricle to the body and back.

Answer: Blood goes through the heart twice per circuit: heart–lungs and heart–body

Check: Double circulation lets the left ventricle re-pressurise blood after the lungs.

2. Now try one with the steps

A student counts 18 pulse beats in 15 seconds. Calculate the heart rate in beats per minute. (1 mark)

Step 1 · Scale up to 60 s

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. Name the blood vessel that carries blood from the heart to the lungs. [1]

2. Name the four chambers of the heart. [2]

3. State the function of the valves in the heart. [1]

4. State the function of each of: red blood cells, white blood cells, platelets, plasma. [4]

5. Count 22 beats in 20 seconds. Calculate the heart rate in beats per minute. [1]

6. Explain why the left ventricle wall is thicker than the right ventricle wall. [2]

7. Explain how red blood cells are adapted to carry oxygen. [3]

8. Describe how the natural resting heart rate is controlled. [2]

9. Explain why veins have valves but arteries do not. [2]

10. 1500 cm³ of blood flows through a vessel in 2.5 minutes. Calculate the rate of flow in cm³ per minute. [2]

11. Explain the function of the coronary arteries. [2]

12. Explain why an artificial pacemaker might be fitted. [2]

13. Explain how the structure of an artery wall relates to its function. [3]

14. Cardiac output = stroke volume $\times$ heart rate. Calculate cardiac output for a stroke volume of 70 cm³ and a heart rate of 75 bpm, in cm³/min. [2]

4. Before you hand it in

"Arteries carry oxygenated blood; veins carry deoxygenated blood."

Arteries carry blood AWAY from the heart; veins carry it TO the heart. The pulmonary artery carries deoxygenated blood.

Labelling the heart you were looking at it from the front

The left side of the heart appears on the RIGHT of a diagram.

"Capillaries have thin walls so blood flows faster."

Thin walls give a short diffusion distance for exchange; the slow flow allows time for exchange.

"The heart pumps blood with oxygen in it to the lungs."

The right ventricle sends DEoxygenated blood to the lungs to pick up oxygen.