

8 Transport in mammals – Part 1

Name: _____ Class: _____ Date: _____

Vocabulary

Write each word three times.

English

Write it 3 times (English)

heart

blood

blood vessels

double circulation

pulmonary circulation

systemic circulation

artery

elastic

lumen

capillary

exchange

vein

valves

plasma

tissue fluid

Recall

At IGCSE you learned that the **heart** pumps **blood** around the body through **blood vessels**. Now we look more carefully at the vessels and the two loops.

- Blood carries oxygen, food and waste around the body.
- The heart is a pump – in fact, two pumps side by side.

Nothing here is harder than IGCSE – it just adds detail and the right words.

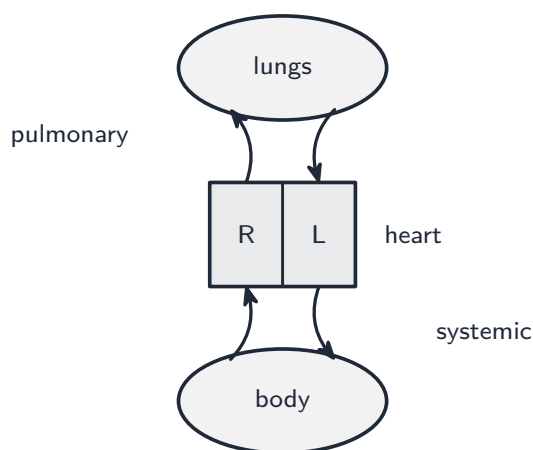
New ideas

Read these first, then do the Practice.

■ 1 Double circulation

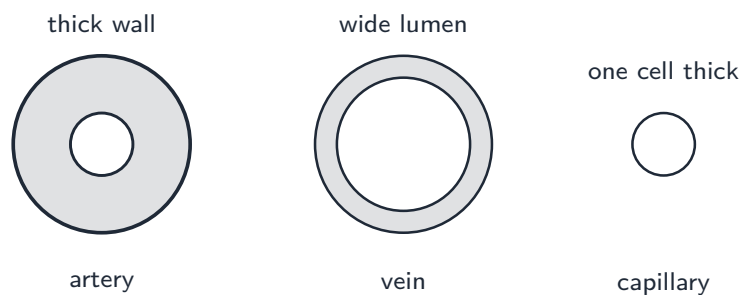
Mammals have a **double circulation**: the blood passes through the heart **twice** for each trip round the body. It is also **closed** (the blood stays inside vessels). There are two loops:

- the **pulmonary circulation** – heart → lungs → heart.
- the **systemic circulation** – heart → body → heart.



■ 2 The three vessels

Vessel	Structure	Function
artery	thick wall of muscle and elastic fibres; narrow lumen	carries blood at high pressure away from the heart
capillary	wall just one cell thick	short distance for exchange of substances
vein	thin wall; wide lumen; has valves	returns blood at low pressure to the heart; valves stop backflow



■ 3 Tissue fluid

At the start of a capillary, high blood pressure pushes liquid (but not cells or large proteins) out of the **plasma** and through the capillary wall. This liquid around the cells is **tissue fluid**. It supplies the cells with oxygen and glucose. Most of it returns to the capillary at the far end, where the pressure is lower.

Watch out: arteries carry blood *away* from the heart at high pressure (thick elastic walls); veins *return* it at low pressure (valves stop backflow); capillaries are one cell thick for fast exchange. “Artery” does not mean “oxygenated”.

Practice

Try these in order.

8.1 What is meant by a *double* circulation? [1]

8.2 Name the loop that carries blood (a) to the lungs, (b) to the rest of the body. [2]

8.3 Explain why an artery has a thick, elastic wall.

[2]

8.4 A capillary wall is only one cell thick. Explain how this suits its function.

[2]

8.5 What is the job of the valves in a vein?

[1]

8.6 What is tissue fluid, and how is it formed?

[2]

8.7 Challenge. The pulmonary artery carries *deoxygenated* blood, yet it is still called an artery. Explain why, using the definition of an artery.

[2]