

8 Transport in mammals – Part 1

Name: _____ Class: _____ Date: _____

Vocabulary 词汇

Write each word three times. 把每个单词抄写三遍。

English	中文	Write it 3 times (English)		
heart	心脏	_____	_____	_____
blood	血液	_____	_____	_____
blood vessels	血管	_____	_____	_____
double circulation	双循环	_____	_____	_____
pulmonary circulation	肺循环	_____	_____	_____
systemic circulation	体循环	_____	_____	_____
artery	动脉	_____	_____	_____
elastic	弹性	_____	_____	_____
lumen	管腔	_____	_____	_____
capillary	毛细血管	_____	_____	_____
exchange	交换	_____	_____	_____
vein	静脉	_____	_____	_____
valves	瓣膜	_____	_____	_____
plasma	血浆	_____	_____	_____
tissue fluid	组织液	_____	_____	_____

Recall

At IGCSE you learned that the **heart** 心脏 pumps **blood** 血液 around the body through **blood vessels** 血管. 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.

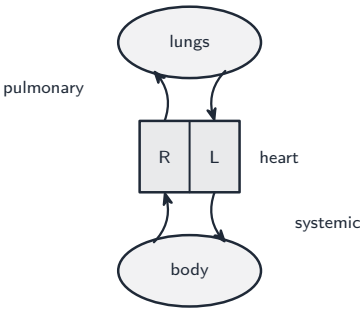
New ideas

Read these first, then do the Practice.

■ 1 Double circulation

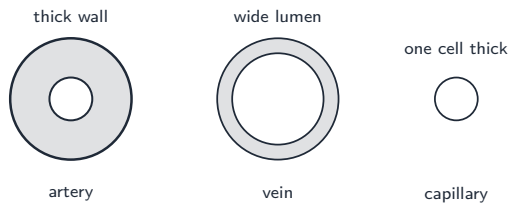
Mammals have a **double circulation** 双循环: the blood passes through the heart **twice** for each trip round the body. It is also **closed** (the blood stays inside vessels). There are two loops:

- the **pulmonary circulation** 肺循环 — heart → lungs → heart.
- the **systemic circulation** 体循环 — heart → body → heart.



■ 2 The three vessels

Vessel	Structure	Function
artery 动脉	thick wall of muscle and elastic 弹性 fibres; narrow lumen 管腔	carries blood at high pressure away from the heart
capillary 毛细血管	wall just one cell thick	short distance for exchange 交换 of substances
vein 静脉	thin wall; wide lumen; has valves 瓣膜	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** 血浆 and through the capillary wall. This liquid around the cells is **tissue fluid** 组织液. 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]