

Exercise walk-through

9.1

Circulatory systems

IGCSE Biology

What the blood is carrying, and what defends it

Red blood cells

Red blood cells
haemoglobin

carry oxygen using the red pigment
. No nucleus, and a biconcave shape –
both give more room and more surface for oxygen.

Phagocytes

Phagocytes

carry out **phagocytosis** : they
surround and digest pathogens.

Lymphocytes

Make **antibodies**
cells behind.

shaped to one antigen, and leave memory

Capillaries

One cell thick and very narrow, giving a large **surface**
area and a short diffusion distance – the whole point of
the circulation.

Every structure here is a shape that fits a job. Say the feature *and* the job it serves.

Exam tips

- Circulatory system = pump (heart) + vessels + valves for one-way flow.
- Double circulation (mammals): blood passes through the heart twice. The left ventricle wall is thickest because it pumps to the whole body.
- Arteries carry blood **away** (thick, high pressure); veins carry it **back** (valves, low pressure); capillaries are for exchange (one cell thick).
- Blood = red cells (oxygen, haemoglobin) + white cells (defence) + platelets (clotting) + plasma (transport).
- Phagocytes engulf pathogens; lymphocytes make antibodies.

Check yourself

- 1 Why is the left ventricle wall the thickest?
- 2 Which vessel carries blood away from the heart?
- 3 What pigment lets red cells carry oxygen?
- 4 How do lymphocytes fight pathogens?



Answers 1. it pumps blood to the whole body 2. an artery 3. haemoglobin 4. they make antibodies

Exercises 2.1·2.2

2.1 Name the three parts of the circulatory system.

[3]

2.2 State how many times blood passes through the heart in a single circulation.

[1]

Exercises 2.1·2.2

2.1 Name the three parts of the circulatory system.

[3]

2.1

- three parts: a **pump (heart)**, **blood vessels**, **valves**

2.2 State how many times blood passes through the heart in a single circulation.

[1]

2.2

- in a single circulation blood passes through the heart **once**

Exercise 3.1

3.1 In a double circulation, blood passes through the heart:

[1]

☐

A once per trip

B twice per trip

C never

D four times per trip

Exercise 3.1

3.1 In a double circulation, blood passes through the heart:

[1]

☐

A once per trip

B twice per trip

C never

D four times per trip

3.1 B

- in a double circulation blood passes through the heart **twice per trip**
- A is single; C and D are wrong

Exercise 3.2 (a)

3.2 Mammals have a double circulation.

(a) State the advantage of a double circulation.

[2]

Exercise 3.2 (a)

3.2 Mammals have a double circulation.

(a) State the advantage of a double circulation.

[2]

(a)

- blood is pumped again at **high pressure** before going to the body
- so it travels faster and **delivers oxygen quickly**

Exercise 3.2 (b)

3.2 Mammals have a double circulation.

(b) State the job of the valves in the circulatory system.

[1]

Exercise 3.2 (b)

3.2 Mammals have a double circulation.

(b) State the job of the valves in the circulatory system.

[1]

(b)

- valves keep the blood flowing **one way only**