

Unit 2: Body Systems, Genetics, Microorganisms and Health

B2.2 Circulatory System

HW Booklet

Name: _____

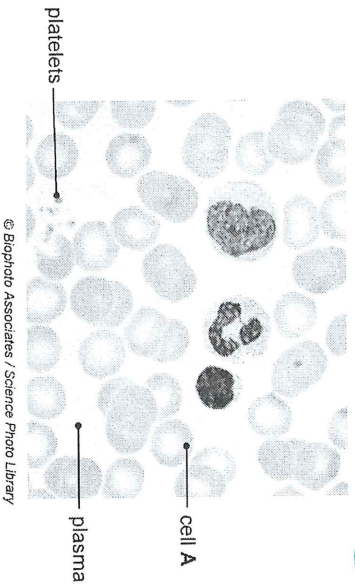
Content - CCEA Double Award Biology 2 - Fort Hill Integrated College	Got it	Nearly	Haven't a clue
B2.2 Circulatory System			
Blood components			
<p>Can you use a microscope to examine a blood smear, identify the component parts and demonstrate understanding of their function?</p> <ul style="list-style-type: none"> • red cells are a specialised cell adapted to oxygen transport - biconcave shape, absence of nucleus and haemoglobin containing iron; • white cells are a defence against disease; • platelets have a role in converting fibrinogen to fibrin, causing blood clotting and scab formation; and • plasma transports cells, food molecules, carbon dioxide, hormones and urea; 			
Cell lysis			
<p>Can you demonstrate knowledge and understanding of the effect of placing red blood cells in water, causing cell lysis?</p>			
Blood vessels			
<p>Can you describe the structure of blood vessels (arteries, veins and capillaries) and relate their structures to their functions, including:</p> <ul style="list-style-type: none"> • wall thickness; • presence of muscle and elastic fibres; • lumen diameter; and • presence of valves; and 			
<p>Can you demonstrate knowledge and understanding of the role of the different types of blood vessel, including:</p>			

<ul style="list-style-type: none"> • arteries carrying blood under high pressure away from the heart (usually oxygenated blood); • veins carry (usually deoxygenated) blood under low pressure towards the heart with valves that maintain the direction of flow; and • capillaries allowing the exchange of material with tissues through permeable walls. 			
<p>Can you name and demonstrate knowledge and understanding of the functions of blood vessels entering and leaving the heart, lungs, liver, kidneys and intestine, describing the sequence and direction of flow in double circulation of oxygenated and deoxygenated blood;</p>			
<p>Effects of exercise</p>			
<p>Can you describe how to investigate the effects of exercise on the pulse rate and describe how the circulatory system benefits from regular exercise - strengthened heart muscle and increased cardiac output when at rest; and</p>			
<p>The heart</p>			
<p>Have you examined the heart and related its structures to the function of a unidirectional pump, including identifying the four chambers, valves, thickness of muscle wall and coronary blood vessels.</p>			

B2.2 The Circulatory System

In this section, students learn about the role of the circulatory system along with its components and their functions. They also investigate the effects of exercise on the circulatory system.

6 The photograph shows a blood smear.



Look at the photograph.

(a) Cell A is adapted to carry oxygen.

(i) Name cell A.

[1]

(ii) Describe **two** ways it is adapted to carry oxygen.

1. _____ [1]

2. _____ [1]

(b) Name **two** substances transported in blood plasma.

1. _____ [1]

2. _____ [1]

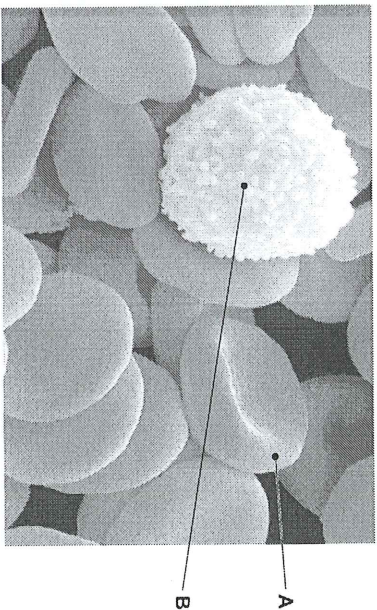
(c) Platelets are shown in the photograph.

Give the function of platelets.

_____ [1]

[Turn over]

12 (a) The photograph shows blood cells.



(i) Name cells A and B.

A _____ [1]

B _____ [1]

(ii) Give the function of cell A.

_____ [1]

(iii) Describe **one** adaptation of cell A, visible in the photograph, and explain how this enables it to carry out its function.

 _____ [2]

Examiner Only
 Marks Remark



(iv) When the skin is cut changes occur in the blood proteins to bring about clotting and scab formation.

Describe these changes.

[3]

(b) Many people suffer from anaemia.

Anaemia is caused by a mineral deficiency.

(i) Name this mineral.

[1]

One of the symptoms of anaemia is lack of energy.

(ii) Explain how anaemia can result in a lack of energy.

[3]

(c) Blood donation and transfusion is needed to treat certain blood disorders.

(i) Name the blood component needed to treat patients who lack clotting factors.

[1]

Turn over

Examiner Only
Marks Remark

Patients with severe burns lose tissue fluid.

(ii) Name the blood component needed to treat these patients.

[1]

The table shows the number of units of blood stored by the UK blood transfusion service and the number of days this store of blood will last.

Blood group	Store of blood/ number of units	Number of days store of blood will last
AB	1465	11.45
A	15281	8.07
B	3352	7.42
O	22430	10.18

© NHS Blood and Transplant

(iii) Comment on the figures for blood group AB and explain what this suggests about the proportion of blood group AB in the population.

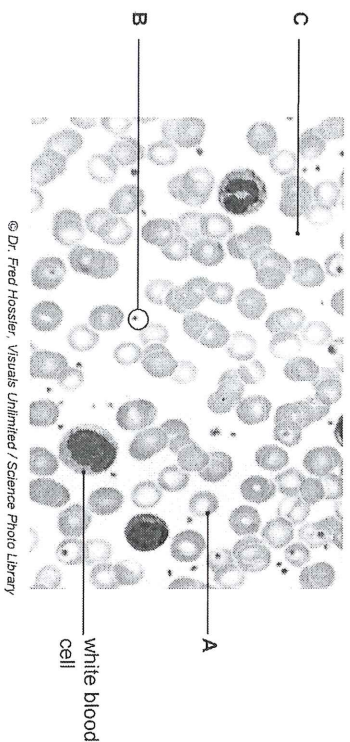
[3]

Examiner Only	
Marks	Remark

Total Question 12

10

8 (a) The photograph shows a blood smear viewed under a microscope.



(i) Complete the table.

Label	Name of blood component	Function
A	Red blood cell	
B		Fibrinogen → fibrin
C		

[4]

(ii) Describe two differences, visible in the photograph, between the red and white blood cells.

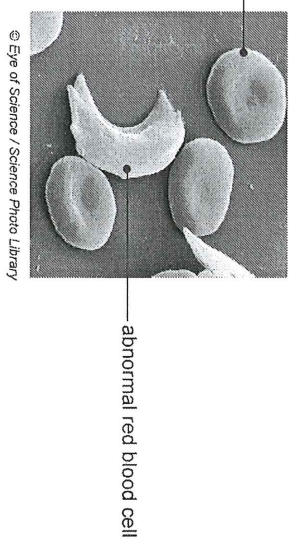
1. _____ [1]
2. _____ [1]

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(iii) Give one other way a red blood cell is adapted to its function.

_____ [1]

The photograph shows the red blood cells of a patient with a genetic disease. Some of the red blood cells are an abnormal shape.



(b) Patients with this disease lack energy and become tired easily. Suggest why.

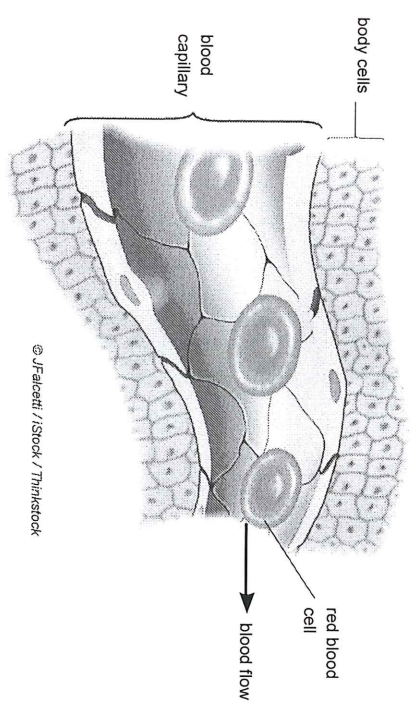
_____ [2]

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Turn over

E

The photograph shows a capillary surrounded by body cells.



(c) The rate of flow of red blood cells through the capillary helps the exchange of gases between the blood and the body cells.

Use evidence from the photograph to explain how.

_____ [3]

E

2 Arteries, veins and capillaries carry blood around the body.

(a) (i) Which type of blood vessel carries blood away from the heart?

_____ [1]

(ii) Which type of blood vessel has walls which are one cell thick?

_____ [1]

(b) Explain why veins have valves.

_____ [1]

(c) Explain why an artery has a thick layer of muscle.

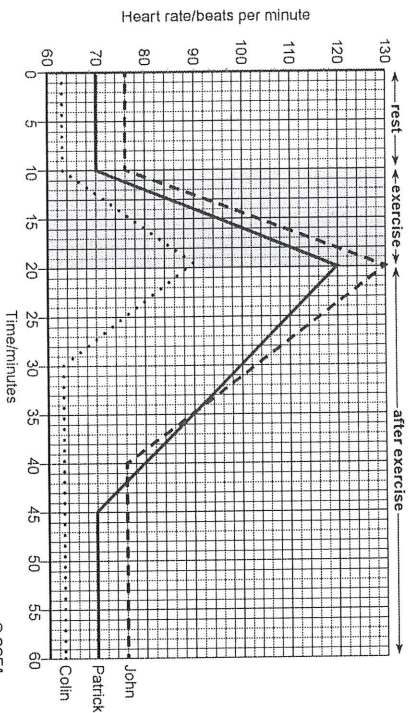
_____ [1]

(d) Name the vein which carries blood from the lungs to the heart.

_____ [1]

G

4 The graph shows the heart rate of three men before, during and after exercise.



Look at the graph.

The recovery time is the time taken for the heart to return to its resting rate after exercise.

The recovery time for John is 20 minutes.

(a) What is the recovery time for Patrick? _____ minutes [1]

(b) One of the men exercises regularly.

(i) Name this man. _____ [1]

(ii) Give two pieces of evidence from the graph to support your answer.

1. _____

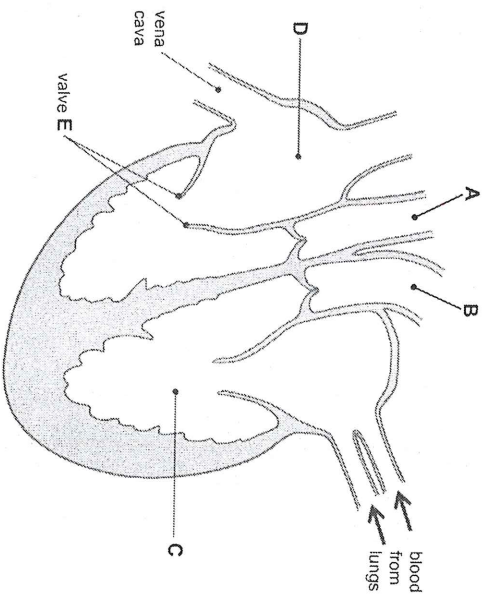
2. _____

[2]

Turn over

H

5 The diagram shows a section through the heart.



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Look at the diagram.

(a) Draw an arrow on the diagram to show the direction of blood flow in vessel A. [1]

(b) Name parts B, C and D.

B _____ [1]

C _____ [1]

D _____ [1]

(c) Explain why the valve E is needed.

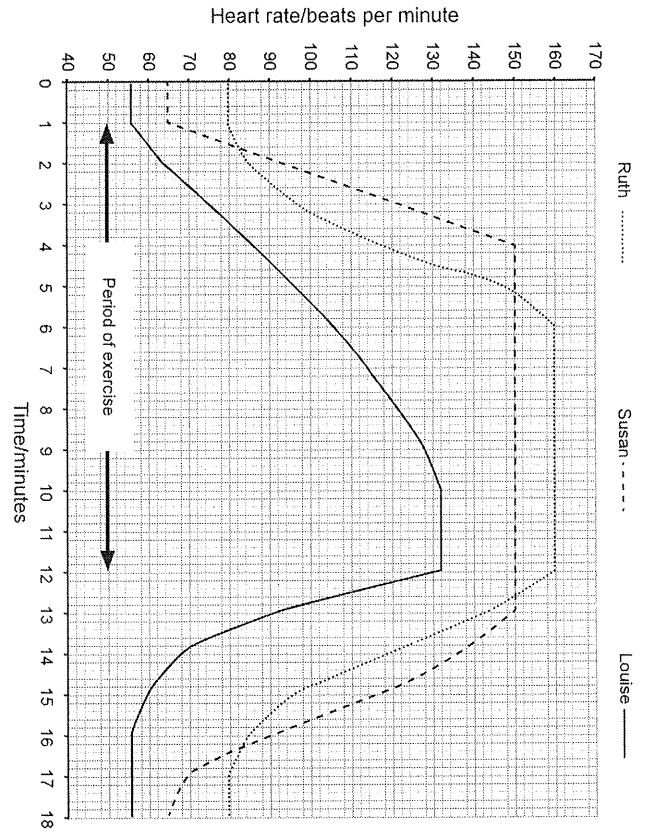
_____ [2]

[2]

Examiner Only	
Marks	Remark
Total Question 5	

10 The graph shows the effect of exercise on the pulse rate of three students.

I



(a) Suggest which student is likely to have trained regularly.

Give two reasons for your choice.

Include data from the graph with each reason.

Student _____ [1]

Reason 1 _____ [1]

Reason 2 _____ [2]

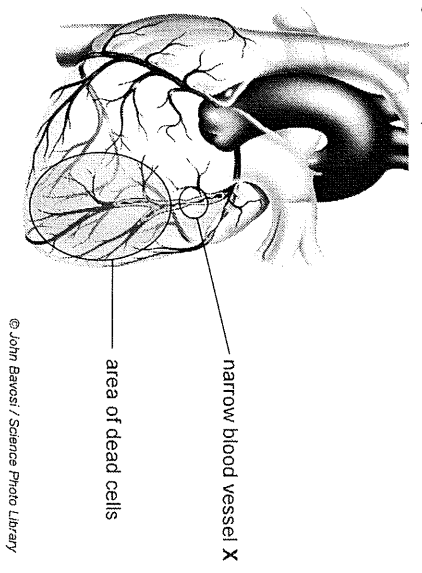
Reason 2 _____ [2]

Reason 2 _____ [2]

(b) Give one way the heart benefits from regular exercise.

_____ [1]

(c) The diagram shows part of a heart after a heart attack.



(i) Name blood vessel X. _____ [1]

(ii) Suggest which type of chamber is affected by this heart attack. _____ [1]

(iii) This heart attack was caused by the inside of blood vessel X becoming blocked. Suggest what caused this blockage. _____ [1]

(iv) Explain what caused the area of dead cells. _____ [3]

 _____ [3]