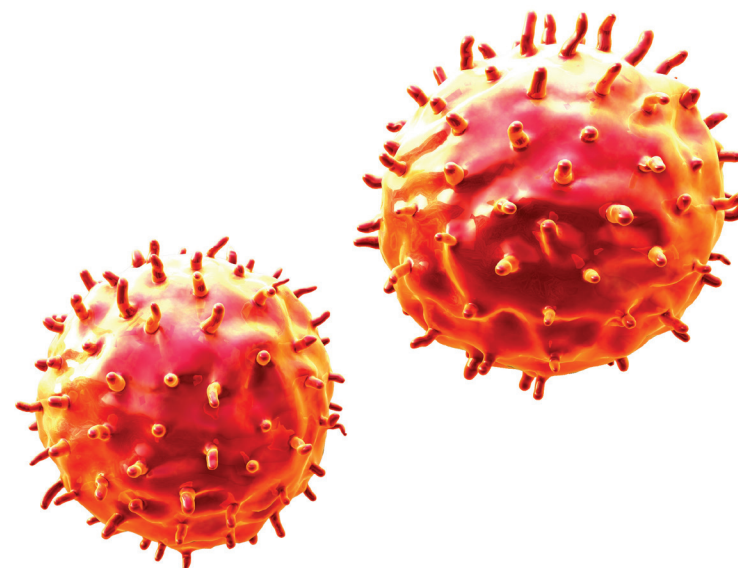


# Interactive Example Candidate Responses

Paper 3 (May / June 2016), Question 3

**Cambridge IGCSE™**  
**Biology 0610**



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3 Fig. 3.1 shows a section through the skin.

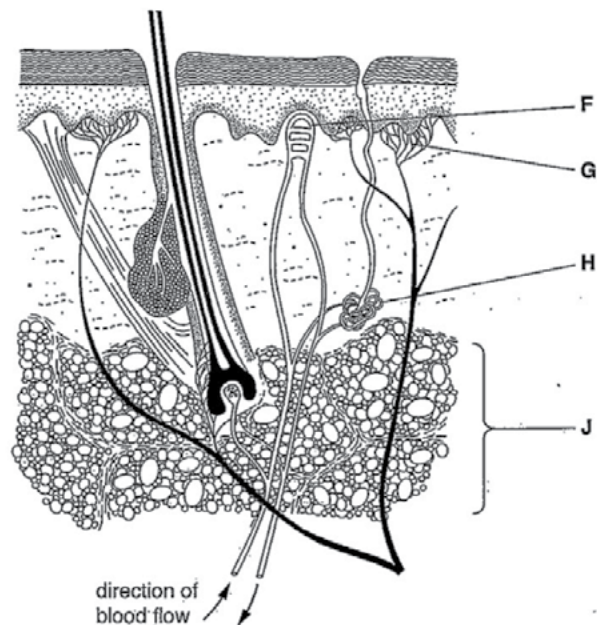


Fig. 3.1

(a) Name the structures labelled in Fig. 3.1 and outline a function in the skin for each one.

Write your answers in Table 3.1.

An example has been done for you.

Table 3.1

structure	name of structure	function in the skin
F	Capillary loop	diabetes and constricts to control the blood flow
G	sensory neurones	detects stimulus
H	sweat gland	produces sweat for cooling the body
J	fatty tissue	insulation for the skin.

[6]

Select page

Your Mark

3(a)

3(b)(i)

3(b)(ii)

3(c)

### Q3 Mark scheme

(a)	label	name	function
	F	capillary ;	transports blood/heat/ supplies oxygen glucose to cells/removes carbon dioxide; <b>I</b> vein/artery
	G	receptors/sensory neurone ;	detect changes in external environment/stimulus/ touch/pressure/ temperature; <b>R</b> detects temperature of the blood <b>I</b> responds to
	H		
	J	adipose tissue/fat/fatty tissue ;	insulation/prevention of heat loss/keeps body warm/shock absorber/ energy store; <b>I</b> fatty acids <b>I</b> dermis
6 marks			
(b)(i)	with no back-pack 6 (arbitrary units); with 9 kg back-pack 13 (arbitrary units); 117(%); <b>I</b> 116.6%		
3 marks			
(b)(ii)	more/increased volume of, sweat produced;		
1 mark			
(c)	1 ref. to evaporation ; <b>I</b> ref. to heat loss by conduction/convection/radiation 2 (of) water/sweat ; 3 (idea of) need for heat/latent heat/energy ; <b>I</b> sweat absorbs heat unqualified 4 (heat/latent heat/energy for evaporation) taken from/ body/skin/blood ; 5 blood carries heat ;		
3 marks			

- (b) In an investigation the volume of sweat produced by a student was measured when running while carrying different masses in a back-pack.



The results are shown in Fig. 3.2.

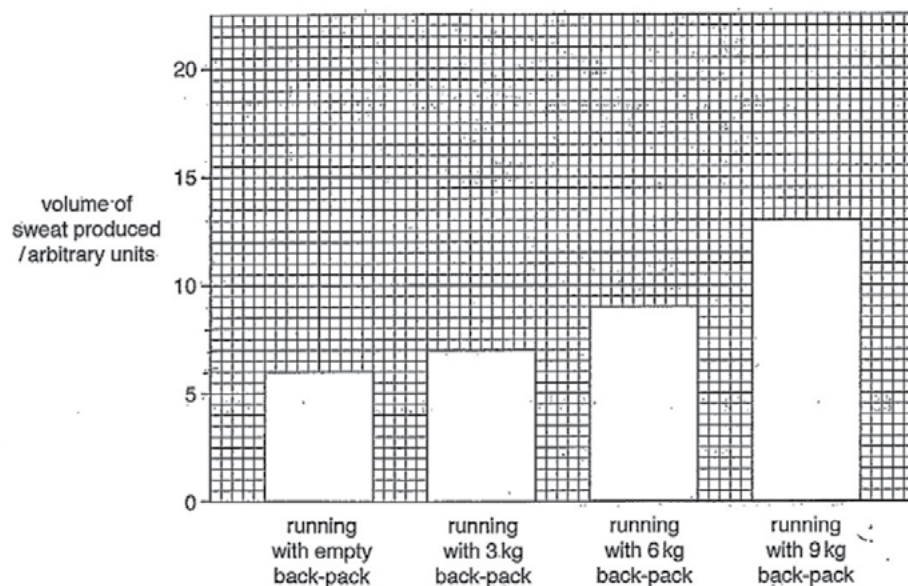


Fig. 3.2

Select  
page

Your  
Mark

3(a)

3(b)(i)

3(b)(ii)

3(c)

Q3	Mark scheme		
(a)	label	name	function
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3 marks			
(b)(ii)	more/increased volume of, sweat produced;		
1 mark			
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3 marks			

(i) Use Fig. 3.2 to state:

the volume of sweat produced when running with an empty back-pack

.....6..... arbitrary units

the volume of sweat produced when running with a 9 kg back-pack

.....13..... arbitrary units

Use these two volumes to calculate the percentage increase in sweat production when running with a 9 kg back-pack.

Give your answer to the nearest whole number.

Show your working.

$$\text{Percentage increase} = \frac{\text{increase}}{\text{original}} \times 100$$

$$\text{Percentage increase} = \frac{(13-6)}{6} \times 100 = 116.6\% \approx 117\%$$

.....54..... %  
[3]

(ii) This investigation was carried out when the air temperature was 10°C.

Predict the effect of carrying out the same investigation if the air temperature was 15°C.

The volume of sweat produced will increase.  
.....[1]

(c) When the student was at rest the volume of sweat produced was 2 arbitrary units.

The volume increases during exercise as the body needs to keep cool.

Explain how this cooling takes place.

Sweat is released at the top of the skin, the water in the sweat evaporates, evaporation needs heat energy from the body, so heat energy is removed from the body so the body cools.  
.....[3]

[Total: 13]

Your  
Mark

3(a)

3(b)(i)

3(b)(ii)

3(c)

Q3 Mark scheme			
(a)	label	name	function
	F	capillary ;	transports blood/heat/ supplies oxygen glucose to cells/removes carbon dioxide; I vein/artery
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6 marks			
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			3 marks
(b)(ii)	more/increased volume of, sweat produced;		
			1 mark
(c)	1 ref. to evaporation ; I ref. to heat loss by conduction/convection/radiation 2 (of) water/sweat ; 3 (idea of) need for heat/latent heat/energy ; I sweat absorbs heat unqualified 4 (heat/latent heat/energy for evaporation) taken from/ body/skin/blood ; 5 blood carries heat ;		
			3 marks



3 Fig. 3.1 shows a section through the skin.

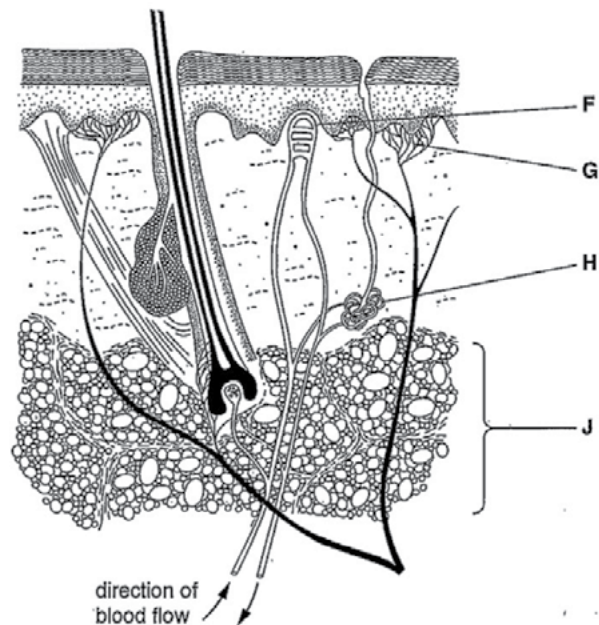


Fig. 3.1

(a) Name the structures labelled in Fig. 3.1 and outline a function in the skin for each one.

Write your answers in Table 3.1.

An example has been done for you.

Table 3.1

structure	name of structure	function in the skin
F	blood capillaries	take in and <del>to</del> out blood.
G	receptors	transport signals.
H	sweat gland	produces sweat for cooling the body
J	Spongy mesophyll	for gas exchange

[6]

Select page

Your Mark

3(a)

3(b)(i)

3(b)(ii)

3(c)

### Q3 Mark scheme

(a)	label	name	function
	F	capillary ;	transports blood/heat/ supplies oxygen glucose to cells/removes carbon dioxide; I vein/artery
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6 marks			
(b)(i)	with no back-pack 6 (arbitrary units); with 9kg back-pack 13 (arbitrary units); 117(%) ; I 116.6%		
			3 marks
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			1 mark
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			3 marks

- (b) In an investigation the volume of sweat produced by a student was measured when running while carrying different masses in a back-pack.



The results are shown in Fig. 3.2.

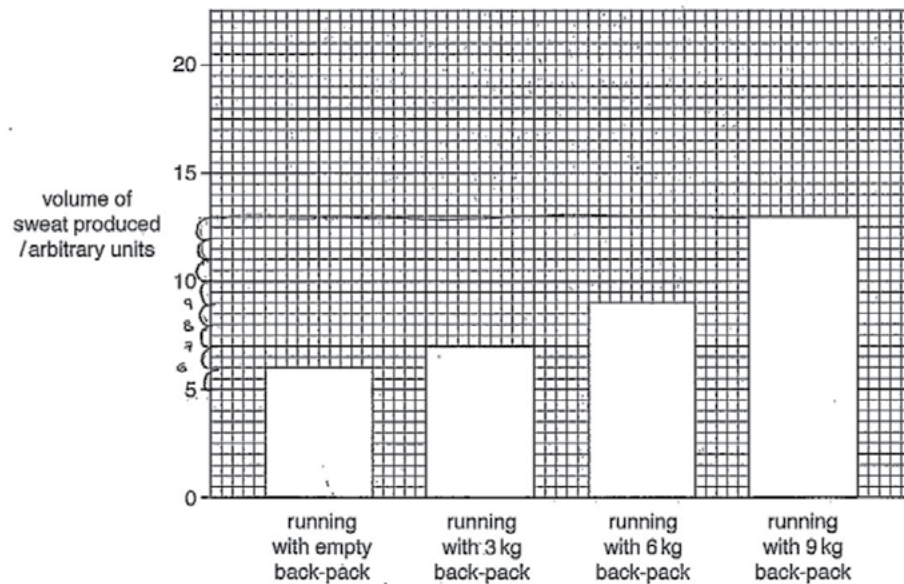


Fig. 3.2

Select  
page

Your  
Mark

3(a)

3(b)(i)

3(b)(ii)

3(c)

Q3	Mark scheme		
(a)	label	name	function
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			3 marks

(i) Use Fig. 3.2 to state:

the volume of sweat produced when running with an empty back-pack

.....6..... arbitrary units

the volume of sweat produced when running with a 9 kg back-pack

.....13..... arbitrary units

Use these two volumes to calculate the percentage increase in sweat production when running with a 9 kg back-pack.

Give your answer to the nearest whole number.

Show your working.

$$\frac{6}{9} \times 100$$

.....117..... %  
[3]

(ii) This investigation was carried out when the air temperature was 10°C.

Predict the effect of carrying out the same investigation if the air temperature was 15°C.

.....Different volumes of sweat produced.....  
[1]

(c) When the student was at rest the volume of sweat produced was 2 arbitrary units.

The volume increases during exercise as the body needs to keep cool.

Explain how this cooling takes place.

.....Cooling takes place by evaporating of water.....  
.....muscles need more energy to contract, more loss.....  
.....of sweat and sweat goes out to keep the.....  
.....body temperature cool and ~~not~~ constant.....  
[3]

[Total: 13]

Your  
Mark

3(a)

3(b)(i)

3(b)(ii)

3(c)

Q3 Mark scheme

(a)	label	name	function
	F	capillary ;	transports blood/heat/ supplies oxygen glucose to cells/removes carbon dioxide; I vein/artery
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			3 marks
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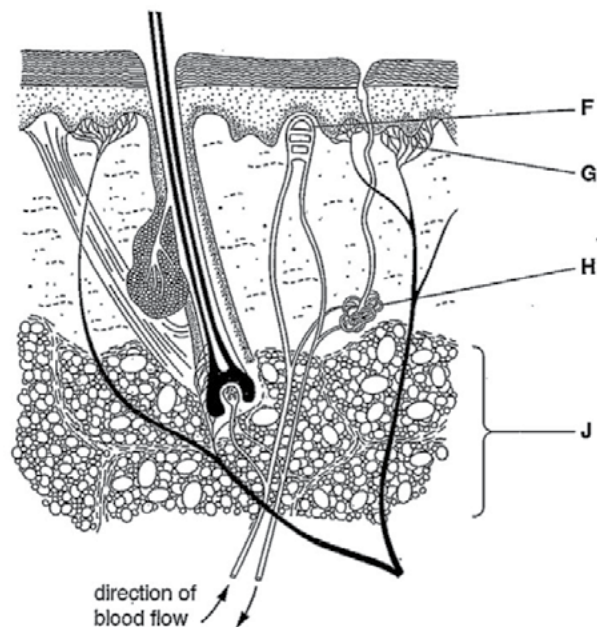


Fig. 3.1

(a) Name the structures labelled in Fig. 3.1 and outline a function in the skin for each one.

Write your answers in Table 3.1.

An example has been done for you.

Table 3.1

structure	name of structure	function in the skin
F	Vein	Support skin with blood Blood supply
G	Nerve	Control movement
H	sweat gland	produces sweat for cooling the body
J	Tissue (group of cells)	Respiration in skin

Select  
page

Your  
Mark

3(a)

3(b)(i)

3(b)(ii)

3(c)

### Q3 Mark scheme

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6 marks			
(b)(i)	with no back-pack 6 (arbitrary units); with 9kg back-pack 13 (arbitrary units); 117(%) I 116.6%		
			3 marks
(b)(ii)	more/increased volume of, sweat produced;		
			1 mark
(c)	1 ref. to evaporation ; I ref. to heat loss by conduction/convection/radiation 2 (of) water/sweat ; 3 (idea of) need for heat/latent heat/energy ; I sweat absorbs heat unqualified 4 (heat/latent heat/energy for evaporation) taken from/ body/skin/blood ; 5 blood carries heat ;		
			3 marks

- (b) In an investigation the volume of sweat produced by a student was measured when running while carrying different masses in a back-pack.



The results are shown in Fig. 3.2.

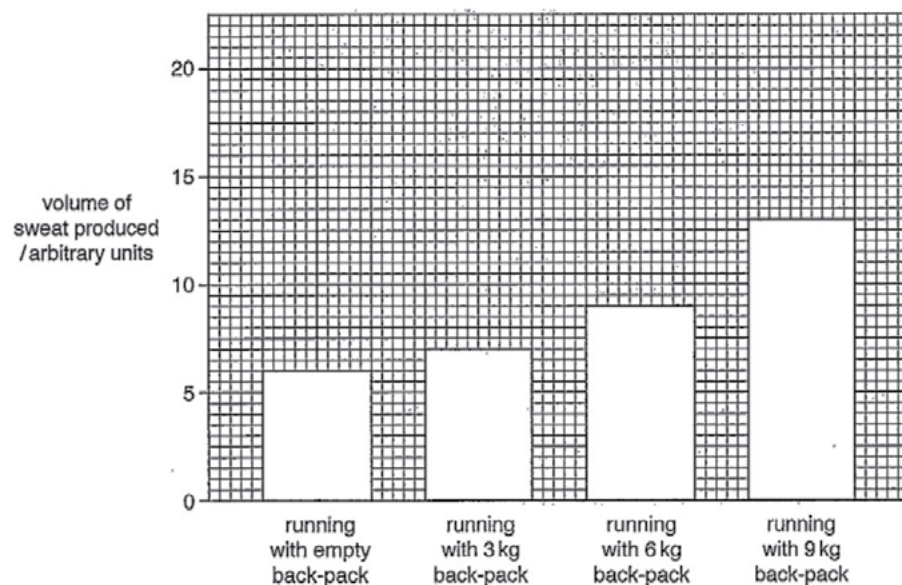


Fig. 3.2

Select page

Your Mark

3(a)

3(b)(i)

3(b)(ii)

3(c)

Q3	Mark scheme		
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			3 marks

(i) Use Fig. 3.2 to state:

the volume of sweat produced when running with an empty back-pack

.....6..... arbitrary units

the volume of sweat produced when running with a 9 kg back-pack

.....13..... arbitrary units

Use these two volumes to calculate the percentage increase in sweat production when running with a 9 kg back-pack.

Give your answer to the nearest whole number.

Show your working.

$$\frac{\text{Number}}{\text{Total}} \times 100 = \frac{6}{13} \times 100$$

.....46..... %  
[3]

(ii) This investigation was carried out when the air temperature was 10°C.

Predict the effect of carrying out the same investigation if the air temperature was 15°C.

.....volume of sweat produced increase.....  
[1]

(c) When the student was at rest the volume of sweat produced was 2 arbitrary units.

The volume increases during exercise as the body needs to keep cool.

Explain how this cooling takes place.

.....By sweating more as when sweat  
volume increases that means that the  
body is working on maintaining a  
certain temperature.....

[3]

[Total: 13]

Your  
Mark

3(a)

3(b)(i)

3(b)(ii)

3(c)

Q3 Mark scheme

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