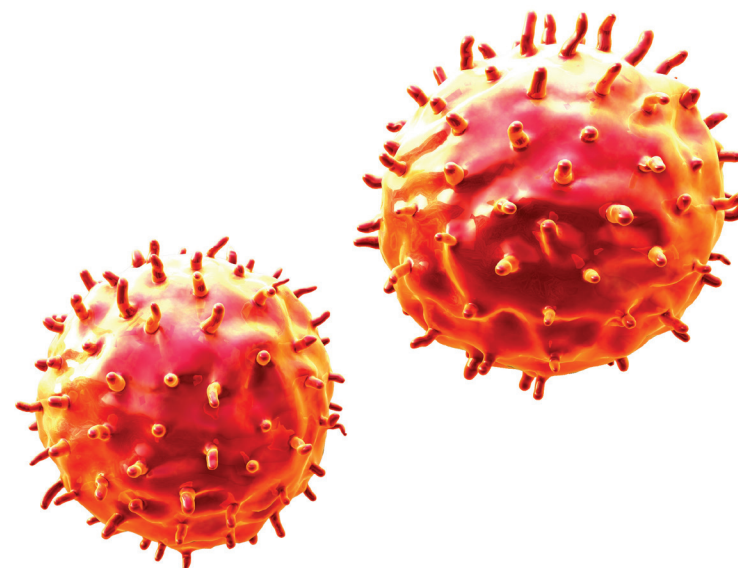


Interactive Example Candidate Responses

Paper 3 (May / June 2016), Question 5

Cambridge IGCSE™
Biology 0610



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5 Fig. 5.1 shows some apparatus used to investigate transpiration:

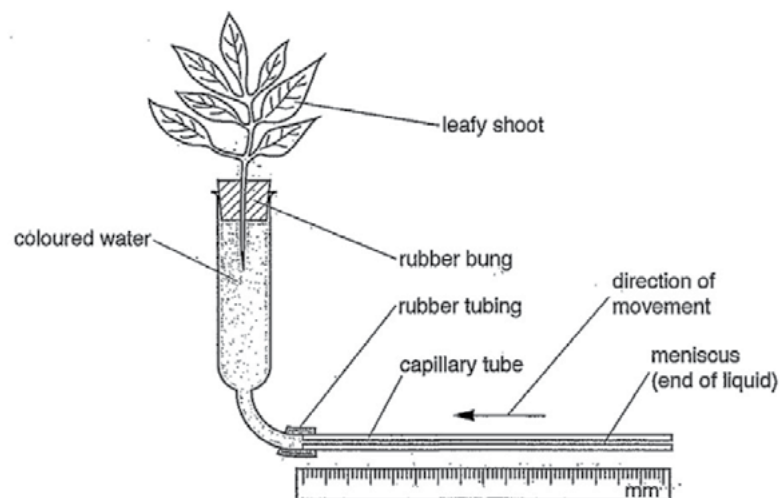


Fig. 5.1

The rate of transpiration can be calculated by measuring how far the meniscus moves in five minutes.

(a) Name the tissue that transports water from the roots to the leaves in a plant.

.....xylem.....[1]

Select
page

Your
Mark

5(a)

5(b)(i)

5(b)(ii)

5(c)(i)

5(c)(ii)

5(d)

Q5	Mark scheme	
(a)	xylem ;	1 mark
(b)(i)	rate of transpiration increases as temperature rises/ ora ; A positive correlation rate of increase becomes faster as temperature rises/ ora ; I efficiency the higher the temperature the greater the distance moved by the meniscus ora ; R incorrect causal relationship in an ora	1 mark
(b)(ii)	1 enzymes will be destroyed/cease to function ; A enzymes denatured 2 shoot/plant/leaf/cells die/no transpiration ; 3 water loss greater than water intake ; A wilting 4 difficulty in achieving temperature (in lab) ;	2 marks
(c)(i)	less transpiration/(meniscus) will not move as fast or as far/slower rate of movement/less water loss/less water uptake ; I smaller/lower results	1 mark
(c)(ii)	1 smaller leaves ; 2 fewer leaves ; 3 less surface area (for transpiration) ; 4 fewer stomata (through which transpiration can occur) ;	2 marks
(d)	humidity ; A air movement/light (intensity)/carbon dioxide concentration	1 mark

- (b) The investigation was carried out at five different temperatures. All other conditions were kept constant.

Table 5.1 shows the results recorded using the apparatus shown in Fig. 5.1.

Table 5.1

temperature/°C	distance moved by meniscus in five minutes/mm
10	28
20	32
30	37
40	44
50	53

- (i) State **one** conclusion that can be drawn from the results in Table 5.1 about the effect of temperature on the rate of transpiration.

when the temperature increase, the rate of transpiration increases. [1]

- (ii) Suggest why the investigation was not continued at temperatures above 50°C.

because the enzymes in the plant will be denatured from high temperature. [2]

Your
Mark

5(a)

5(b)(i)

5(b)(ii)

5(c)(i)

5(c)(ii)

5(d)

Q5	Mark scheme	
(a)	xylem ;	1 mark
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(c)(ii)	1 smaller leaves ; 2 fewer leaves ; 3 less surface area (for transpiration) ; 4 fewer stomata (through which transpiration can occur) ;	2 marks
(d)	humidity ; A air movement/light (intensity)/carbon dioxide concentration	1 mark

(c) The investigation was repeated using the leafy shoot shown in Fig. 5.2.



Fig. 5.2

(i) Predict how these results would be different to the results shown in Table 5.1.

The results will be less than the results in Table 5.1 [1]

(ii) Give two reasons why the results would be different.

because this leafy shoot is smaller than the other and has less leaves than the other, so the amount of water moved will be less. [2]

(d) State one factor, other than temperature, that can affect the rate of transpiration.

humidity [1]

[Total: 8]

Select page

Your Mark

5(a)

5(b)(i)

5(b)(ii)

5(c)(i)

5(c)(ii)

5(d)

Q5	Mark scheme	
(a)	xylem ;	1 mark
(b)(i)	rate of transpiration increases as temperature rises/ ora ; A positive correlation rate of increase becomes faster as temperature rises/ ora ; I efficiency the higher the temperature the greater the distance moved by the meniscus ora ; R incorrect causal relationship in an ora	1 mark
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(c)(i)	less transpiration/(meniscus) will not move as fast or as far/slower rate of movement/less water loss/less water uptake ; I smaller/lower results	1 mark
(c)(ii)	1 smaller leaves ; 2 fewer leaves ; 3 less surface area (for transpiration) ; 4 fewer stomata (through which transpiration can occur) ;	2 marks
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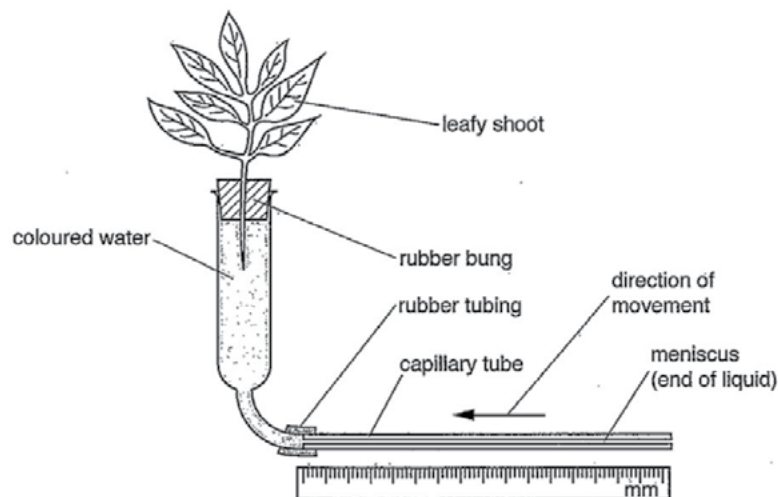


Fig. 5.1

The rate of transpiration can be calculated by measuring how far the meniscus moves in five minutes.

(a) Name the tissue that transports water from the roots to the leaves in a plant.

Xylem tissue [1]

Select
page

Your
Mark

5(a)

5(b)(i)

5(b)(ii)

5(c)(i)

5(c)(ii)

5(d)

Q5	Mark scheme	
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(d)	humidity ; A air movement/light (intensity)/carbon dioxide concentration	1 mark

- (b) The investigation was carried out at five different temperatures. All other conditions were kept constant.

Table 5.1 shows the results recorded using the apparatus shown in Fig. 5.1.

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temperature/°C	distance moved by meniscus in five minutes/mm
10	28
20	32
30	37
40	44
50	53

- (i) State **one** conclusion that can be drawn from the results in Table 5.1 about the effect of temperature on the rate of transpiration.

As temperature increase, the rate of transpiration increase. [1]

- (ii) Suggest why the investigation was not continued at temperatures above 50°C.

Because above 50°C causes the air to be saturated with water vapour (humidity) the rate of transpiration will decrease. [2]

Your
Mark

5(a)

5(b)(i)

5(b)(ii)

5(c)(i)

5(c)(ii)

5(d)

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(d)	humidity ; A air movement/light (intensity)/carbon dioxide concentration 1 mark

(c) The investigation was repeated using the leafy shoot shown in Fig. 5.2.



Fig. 5.2

(i) Predict how these results would be different to the results shown in Table 5.1.

The distance moved by the meniscus in 5 minute will decrease. [1]

(ii) Give two reasons why the results would be different.

① Because few leaves are used
② Because the rate of transpiration will decrease. [2]

(d) State one factor, other than temperature, that can affect the rate of transpiration.

humidity [1]

[Total: 8]

Select page

Your Mark

5(a)

5(b)(i)

5(b)(ii)

5(c)(i)

5(c)(ii)

5(d)

Q5	Mark scheme	
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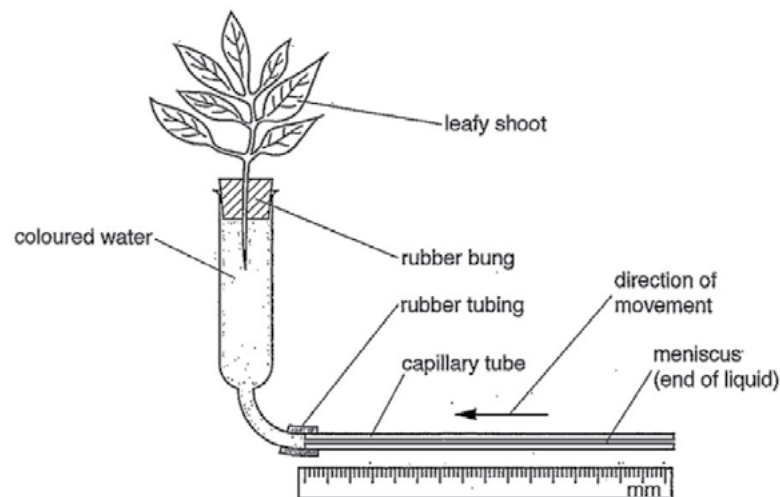


Fig. 5.1

The rate of transpiration can be calculated by measuring how far the meniscus moves in five minutes.

(a) Name the tissue that transports water from the roots to the leaves in a plant.

xylem [1]

Select
page

Your
Mark

5(a)

5(b)(i)

5(b)(ii)

5(c)(i)

5(c)(ii)

5(d)

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- (b) The investigation was carried out at five different temperatures. All other conditions were kept constant.

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temperature/°C	distance moved by meniscus in five minutes/mm
10	28
20	32
30	37
40	44
50	53

- (i) State **one** conclusion that can be drawn from the results in Table 5.1 about the effect of temperature on the rate of transpiration.

As ~~temp~~ temperature increases the distance moved by meniscus ~~is~~ increases [1]

- (ii) Suggest why the investigation was not continued at temperatures above 50°C.

because it would have been too hot for the meniscus to move and the thermometer wouldn't record because it has reached the end of its scale [2]

Your
Mark

5(a)

5(b)(i)

5(b)(ii)

5(c)(i)

5(c)(ii)

5(d)

Q5	Mark scheme	
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(c) The investigation was repeated using the leafy shoot shown in Fig. 5.2.



Fig. 5.2

(i) Predict how these results would be different to the results shown in Table 5.1.

~~The distance~~ it would be less accurate. [1]

(ii) Give two reasons why the results would be different.

different conditions. different apparatus used. [2]

(d) State one factor, other than temperature, that can affect the rate of transpiration.

humidity and amount of rain fall. [1]

[Total: 8]

Select page

Your Mark

5(a)

5(b)(i)

5(b)(ii)

5(c)(i)

5(c)(ii)

5(d)

Q5	Mark scheme	
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