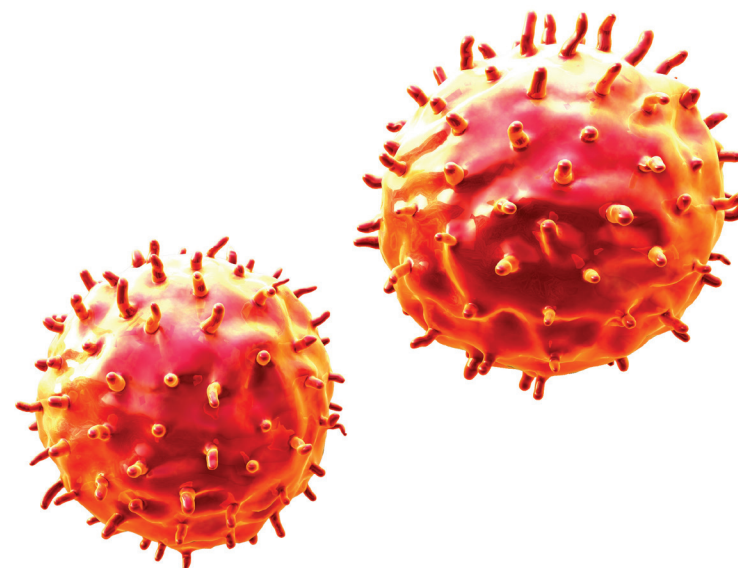


Interactive Example Candidate Responses

Paper 6 (May / June 2016), Question 2

Cambridge IGCSE™
Biology 0610



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- 2 Fig. 2.1 is a photograph of a cross-section of a vascular bundle in a leaf. Line AB shows the length of the vascular bundle.

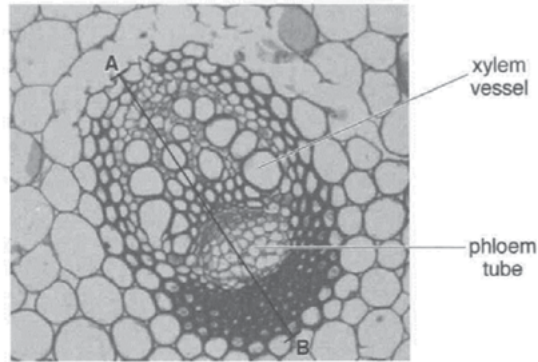
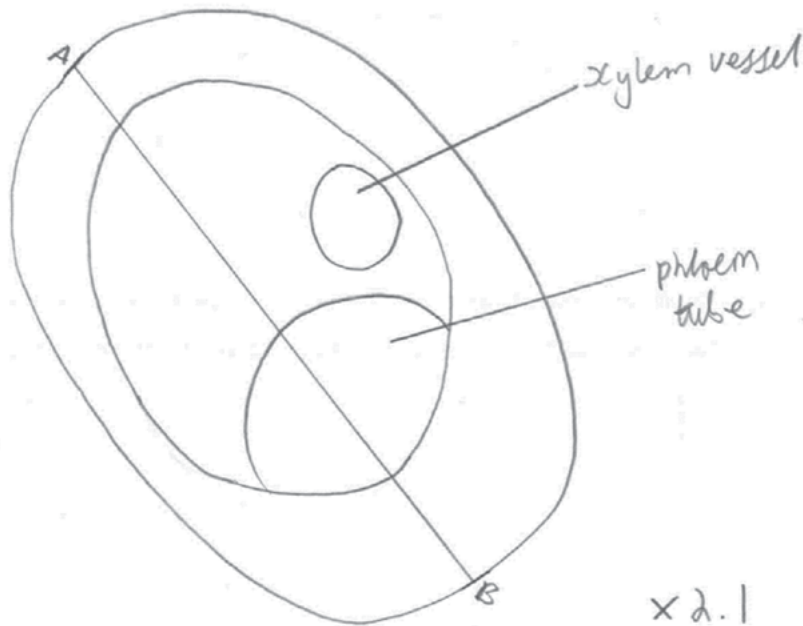


Fig. 2.1

- (a) (i) Make a large drawing to show the different regions of the vascular bundle shown in Fig. 2.1. Do **not** draw any individual cells. Identify and label on your drawing the position of the xylem vessel as shown in Fig. 2.1.



Select
page

Your
Mark

2(a)(i)

2(a)(ii)

2(a)(iii)

2(b)

Q2	Mark scheme
(a)(i)	<p>Outlines – all lines single, clear and unbroken ; Size – occupies at least half of the space provided ; Detail – oval shape + phloem + 1 other area ; two other areas shown ; Label – line to correct area on drawing to show position of xylem (vessel) and line labelled "xylem"</p> <p style="text-align: right;">5 marks</p>
(a)(ii)	<p>measurement of AB = 58 mm; ± 1 mm A cm/µm I other units line on their drawing and length measured with correct unit ; ± 1 mm R if no line drawn or position not indicated/line in incorrect Position correct magnification calculation; R if units given ecf if measurement(s) above are incorrect</p> <p style="text-align: right;">3 marks</p>
(a)(iii)	<p>(xylem) walls thick(er)/large (er)/wide(er); (xylem vessels) round(er) ; (xylem) has large(r) cross section area/big(ger) ;</p> <p style="text-align: right;">1 mark</p>
(b)	<p>1 use of any suitable plant material; 2 put stem/material chosen in (red) dye/add dye to cut (stem) surface; I stain it red 3 time for absorption of dye; 4 cut (sections) of stem or material chosen; 5 (red stained xylem) will indicate position of vascular bundle; I xylem alone</p> <p style="text-align: right;">4 marks</p>

- (ii) Measure the length of line **AB** as shown on Fig. 2.1. **Include the unit.**

Length of **AB** 5.8 mm

Mark on your drawing a line in the same position as **AB**.

Measure the line you have drawn.

Length of line on drawing 121 mm

$$\text{magnification} = \frac{\text{length of line on drawing}}{\text{length of AB}}$$

Calculate the magnification of your drawing using the information above and your answers.

Show your working: $\text{magnification} = \frac{\text{length line on drawing}}{\text{length of AB}}$

$$M = \frac{121}{5.8}$$

$$M = 2.086 \text{ magnification} \times 2.1$$

[3]

- (iii) State **one** way visible in Fig. 2.1 in which the xylem vessel is different from the phloem tube.

The phloem tube is made up of lots of cells whereas the xylem vessel is hollow.

[1]

- (b) The walls of xylem vessels are supported by a chemical called lignin, which can be stained by a red dye. This makes the xylem vessel walls easily seen when using a microscope.

Use this information to plan how you could find the position of the vascular bundles in a stem.

you could cut ^{out} a cross-section of a stem and place it on a white tile so the ~~back~~ ^{other} colour can easily ~~be~~ ^{be} seen. you could take 5 pieces of samples (cross sections) of the stem and cut them all the same ~~size~~ ^{same} depth of 10 mm. you could then add 5 drops of the dye to each cross section of the stem, which would highlight the xylem vessel. Then you could measure the distance ~~of the~~ ^{from the} xylem ~~from~~ ^{vessel} on a microscope and compare it with the actual ruler, to locate the outline of the vascular bundle in each sample. ^{using light}

[Total: 13]

Sample allows for errors in the measuring, as the vascular bundle may be in a different place in each case.

Select
page

Your
Mark

2(a)(i)

2(a)(ii)

2(a)(iii)

2(b)

Q2	Mark scheme
(a)(i)	<p>Outlines – all lines single, clear and unbroken ; Size – occupies at least half of the space provided ; Detail – oval shape + phloem + 1 other area ; two other areas shown ; Label – line to correct area on drawing to show position of xylem (vessel) and line labelled “xylem”</p> <p>5 marks</p>
(a)(ii)	<p>measurement of AB = 58 mm; ± 1 mm A cm/µm I other units line on their drawing and length measured with correct unit ; ± 1 mm R if no line drawn or position not indicated/line in incorrect Position correct magnification calculation; R if units given ecf if measurement(s) above are incorrect</p> <p>3 marks</p>
(a)(iii)	<p>(xylem) walls thick(er)/large (er)/wide(er); (xylem vessels) round(er) ; (xylem) has large(r) cross section area/big(ger) ;</p> <p>1 mark</p>
(b)	<p>1 use of any suitable plant material; 2 put stem/material chosen in (red) dye/add dye to cut (stem) surface; I stain it red 3 time for absorption of dye; 4 cut (sections) of stem or material chosen; 5 (red stained xylem) will indicate position of vascular bundle; I xylem alone</p> <p>4 marks</p>

- 2 Fig. 2.1 is a photograph of a cross-section of a vascular bundle in a leaf. Line AB shows the length of the vascular bundle.

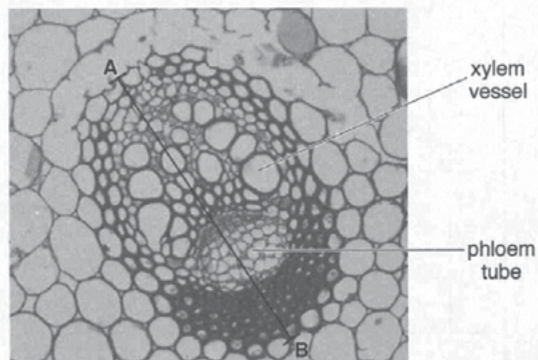
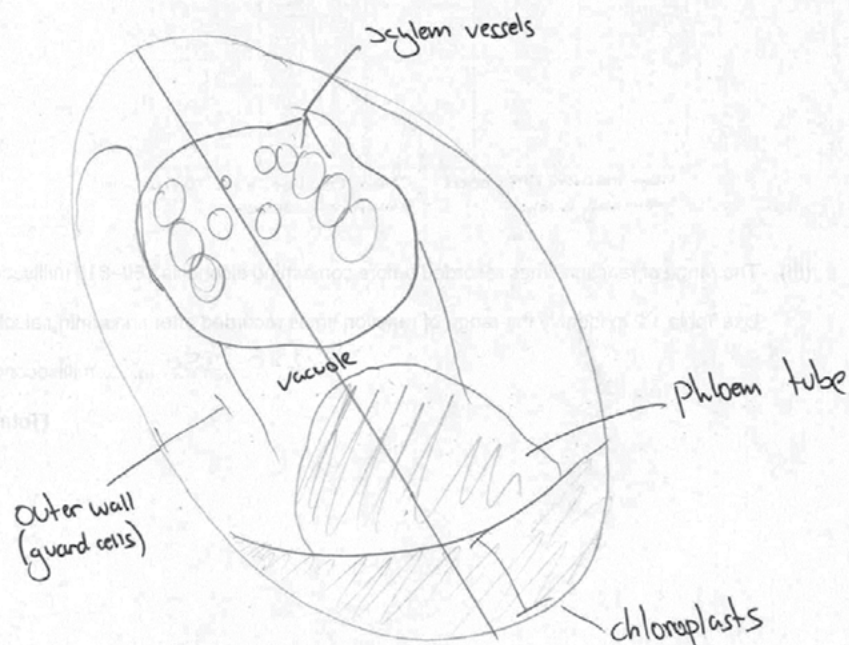


Fig. 2.1

- (a) (i) Make a large drawing to show the different regions of the vascular bundle shown in Fig. 2.1. Do **not** draw any individual cells. Identify and label on your drawing the position of the xylem vessel as shown in Fig. 2.1.



[5]

Select
page

Your
Mark

2(a)(i)

2(a)(ii)

2(a)(iii)

2(b)

Q2	Mark scheme	
(a)(i)	<p>Outlines – all lines single, clear and unbroken ;</p> <p>Size – occupies at least half of the space provided ;</p> <p>Detail – oval shape + phloem + 1 other area ;</p> <p>two other areas shown ;</p> <p>Label – line to correct area on drawing to show position of xylem (vessel) and line labelled "xylem"</p>	5 marks
(a)(ii)	<p>measurement of AB = 58 mm;</p> <p>± 1 mm</p> <p>A cm/µm I other units</p> <p>line on their drawing and length measured with correct unit ;</p> <p>± 1 mm</p> <p>R if no line drawn or position not indicated/line in incorrect Position</p> <p>correct magnification calculation;</p> <p>R if units given</p> <p>ecf if measurement(s) above are incorrect</p>	3 marks
(a)(iii)	<p>(xylem) walls thick(er)/large (er)/wide(er);</p> <p>(xylem vessels) round(er) ;</p> <p>(xylem) has large(r) cross section area/big(ger) ;</p>	1 mark
(b)	<p>1 use of any suitable plant material;</p> <p>2 put stem/material chosen in (red) dye/add dye to cut (stem) surface;</p> <p>I stain it red</p> <p>3 time for absorption of dye;</p> <p>4 cut (sections) of stem or material chosen;</p> <p>5 (red stained xylem) will indicate position of vascular bundle;</p> <p>I xylem alone</p>	4 marks

- (ii) Measure the length of line AB as shown on Fig. 2.1. Include the unit.

Length of AB 59 mm

Mark on your drawing a line in the same position as AB.

Measure the line you have drawn.

Length of line on drawing 140 mm

$$\text{magnification} = \frac{\text{length of line on drawing}}{\text{length of AB}}$$

Calculate the magnification of your drawing using the information above and your answers.

Show your working.

$$\frac{140}{59} = 2.37$$

magnification $\times 2.37$ [3]

- (iii) State **one** way visible in Fig. 2.1 in which the xylem vessel is different from the phloem tube.

The xylem vessels are much wider. [1]

- (b) The walls of xylem vessels are supported by a chemical called lignin, which can be stained by a red dye. This makes the xylem vessel walls easily seen when using a microscope.

Use this information to plan how you could find the position of the vascular bundles in a stem.

Use the dye to enter the xylem vessels. Disect the stem.
In order to find the vascular bundle, look for a large area that is dyed red. This is your bundle. [4]

[Total: 13]

Your
Mark

2(a)(i)

2(a)(ii)

2(a)(iii)

2(b)

Q2	Mark scheme
(a)(i)	<p>Outlines – all lines single, clear and unbroken ; Size – occupies at least half of the space provided ; Detail – oval shape + phloem + 1 other area ; two other areas shown ; Label – line to correct area on drawing to show position of xylem (vessel) and line labelled “xylem”</p> <p>5 marks</p>
(a)(ii)	<p>measurement of AB = 58 mm; ± 1 mm A cm/µm I other units line on their drawing and length measured with correct unit ; ± 1 mm R if no line drawn or position not indicated/line in incorrect Position correct magnification calculation; R if units given ecf if measurement(s) above are incorrect</p> <p>3 marks</p>
(a)(iii)	<p>(xylem) walls thick(er)/large (er)/wide(er); (xylem vessels) round(er) ; (xylem) has large(r) cross section area/big(ger) ;</p> <p>1 mark</p>
(b)	<p>1 use of any suitable plant material; 2 put stem/material chosen in (red) dye/add dye to cut (stem) surface; I stain it red 3 time for absorption of dye; 4 cut (sections) of stem or material chosen; 5 (red stained xylem) will indicate position of vascular bundle; I xylem alone</p> <p>4 marks</p>

- 2 Fig. 2.1 is a photograph of a cross-section of a vascular bundle in a leaf.
Line AB shows the length of the vascular bundle.

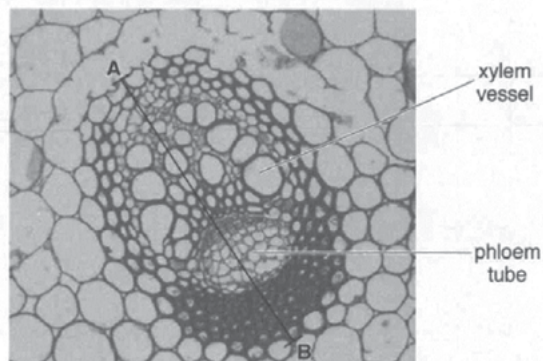
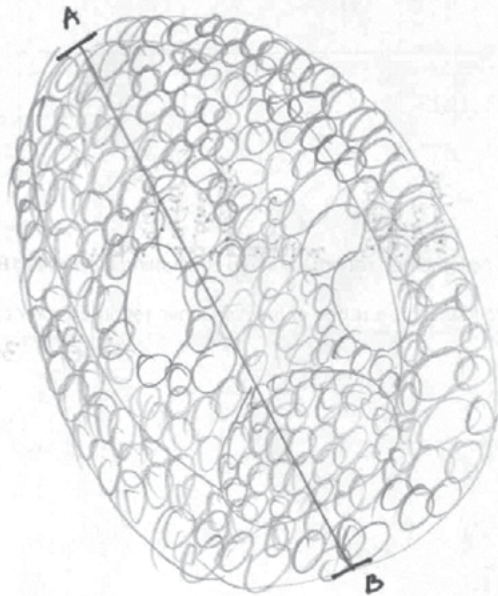


Fig. 2.1

- (a) (i) Make a large drawing to show the different regions of the vascular bundle shown in Fig. 2.1.
Do **not** draw any individual cells.
Identify and label on your drawing the position of the xylem vessel as shown in Fig. 2.1.



Your
Mark

2(a)(i)

2(a)(ii)

2(a)(iii)

2(b)

Q2	Mark scheme	
(a)(i)	<p>Outlines – all lines single, clear and unbroken ; Size – occupies at least half of the space provided ; Detail – oval shape + phloem + 1 other area ; two other areas shown ; Label – line to correct area on drawing to show position of xylem (vessel) and line labelled "xylem"</p>	5 marks
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(a)(iii)	<p>(xylem) walls thick(er)/large (er)/wide(er); (xylem vessels) round(er) ; (xylem) has large(r) cross section area/big(ger) ;</p>	1 mark
(b)	<p>1 use of any suitable plant material; 2 put stem/material chosen in (red) dye/add dye to cut (stem) surface; I stain it red 3 time for absorption of dye; 4 cut (sections) of stem or material chosen; 5 (red stained xylem) will indicate position of vascular bundle; I xylem alone</p>	4 marks

- (ii) Measure the length of line AB as shown on Fig. 2.1. Include the unit.

Length of AB 59 mm

1 cm = 10 mm
5.9 =

Mark on your drawing a line in the same position as AB.

Measure the line you have drawn.

Length of line on drawing 109 mm

$$\text{magnification} = \frac{\text{length of line on drawing}}{\text{length of AB}}$$

Calculate the magnification of your drawing using the information above and your answers.

Show your working.

$$\frac{109}{59}$$

$$\text{magnification} \times \frac{109}{59} \text{ mm} \quad [3]$$

- (iii) State one way visible in Fig. 2.1 in which the xylem vessel is different from the phloem tube.

Xylem vessel are bigger and wider than phloem tube.

[1]

- (b) The walls of xylem vessels are supported by a chemical called lignin, which can be stained by a red dye. This makes the xylem vessel walls easily seen when using a microscope.

Use this information to plan how you could find the position of the vascular bundles in a stem.

→ Put few drops of lignin in the steam.

→ If the colour wait till it diffuse.

→ The part where you can put it under the microscope.

→ The part which will be red in colour → Vascular bundles.

[4]

[Total: 13]

Your
Mark

2(a)(i)

2(a)(ii)

2(a)(iii)

2(b)

Q2	Mark scheme
(a)(i)	<p>Outlines – all lines single, clear and unbroken ;</p> <p>Size – occupies at least half of the space provided ;</p> <p>Detail – oval shape + phloem + 1 other area ;</p> <p>two other areas shown ;</p> <p>Label – line to correct area on drawing to show position of xylem (vessel) and line labelled “xylem”</p> <p>5 marks</p>
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(b)	<p>1 use of any suitable plant material ;</p> <p>2 put stem/material chosen in (red) dye/add dye to cut (stem) surface ;</p> <p>I stain it red</p> <p>3 time for absorption of dye ;</p> <p>4 cut (sections) of stem or material chosen ;</p> <p>5 (red stained xylem) will indicate position of vascular bundle ;</p> <p>I xylem alone</p> <p>4 marks</p>

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