

12 What is a structural feature of xylem vessels?

- A** contain many mitochondria
- B** made up of cells joined end to end
- C** presence of cross walls
- D** thin walls

13 During the growing season, tomato plants produce flowers and fruits.

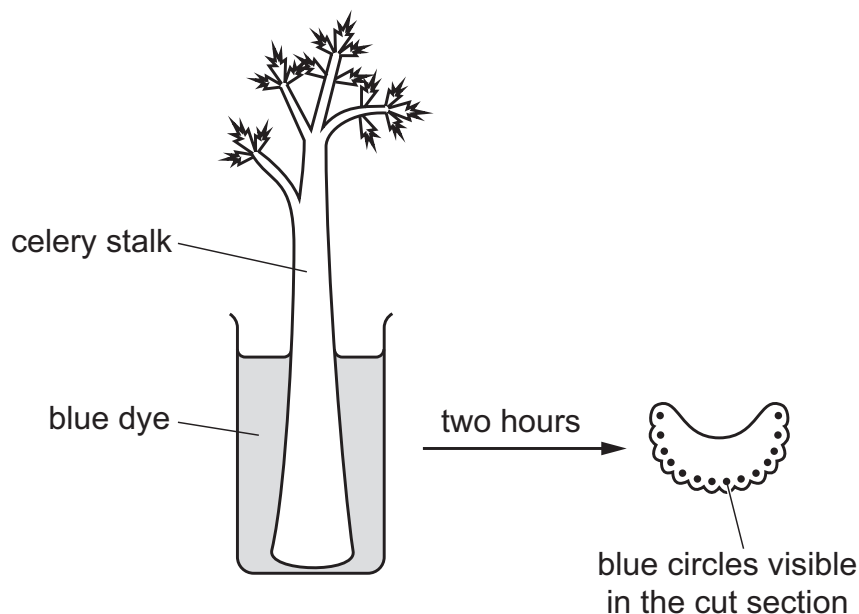
Which parts of a growing tomato plant are sources, and which parts are sinks?

	flowers	fruits	leaves
A	sink	sink	source
B	sink	source	sink
C	source	sink	source
D	source	source	sink

10 A student cut one stalk of celery from a celery plant.

They put the celery stalk into a beaker of blue dye.

The celery stalk was removed from the blue dye after two hours and was cut into sections.



What is shown by the blue circles in the cut sections of celery stalk?

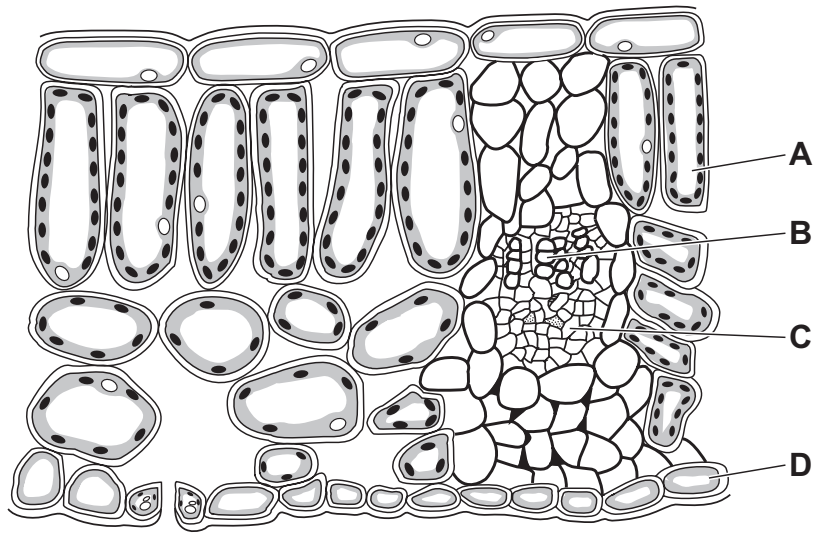
- A** position of the cortex cells
- B** position of the palisade cells
- C** position of the phloem cells
- D** position of the xylem vessels

11 Which process moves water from the surfaces of the mesophyll cells into the air spaces during transpiration?

- A** active transport
- B** circulation
- C** evaporation
- D** osmosis

9 The diagram shows part of a cross-section of a leaf.

Which part is the xylem?



2 (a) Dicotyledons and monocotyledons belong to the plant kingdom.

(i) State **two** main features of plants.

1

2 [2]

(ii) State the names of **two** other kingdoms.

1

2 [2]

(b) Fig. 2.1 is a diagram of a cross-section of a monocotyledonous stem.

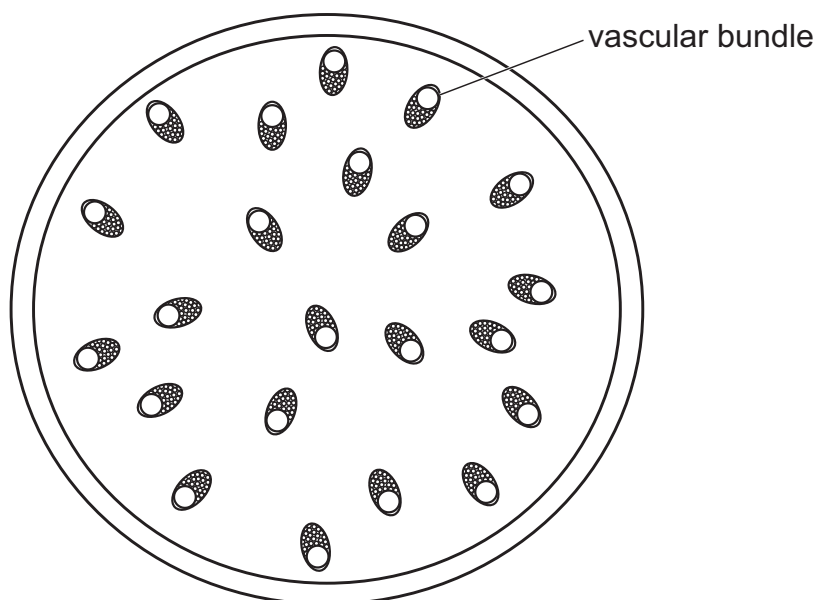


Fig. 2.1

Describe how the distribution of vascular bundles in a dicotyledonous stem would differ from the monocotyledonous stem shown in Fig. 2.1.

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..... [1]

(c) Fig. 2.2 is an incomplete drawing of a cross-section of a dicotyledonous root.

Complete Fig. 2.2 by:

- sketching the distribution of phloem and xylem
- labelling the phloem, xylem and a root hair.

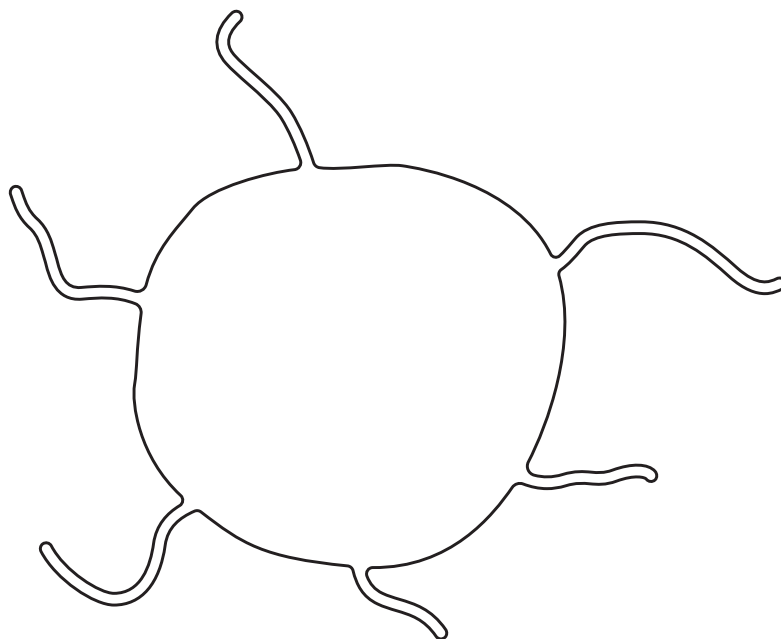


Fig. 2.2

[3]

(d) State **two** functions of xylem.

1

2

[2]

(e) A farmer investigated the effect of girdling on the mass of apple fruit produced by apple trees.

The farmer removed a 3 mm strip of bark and phloem tissue from the branches that produce the fruit, as shown in Fig. 2.3.

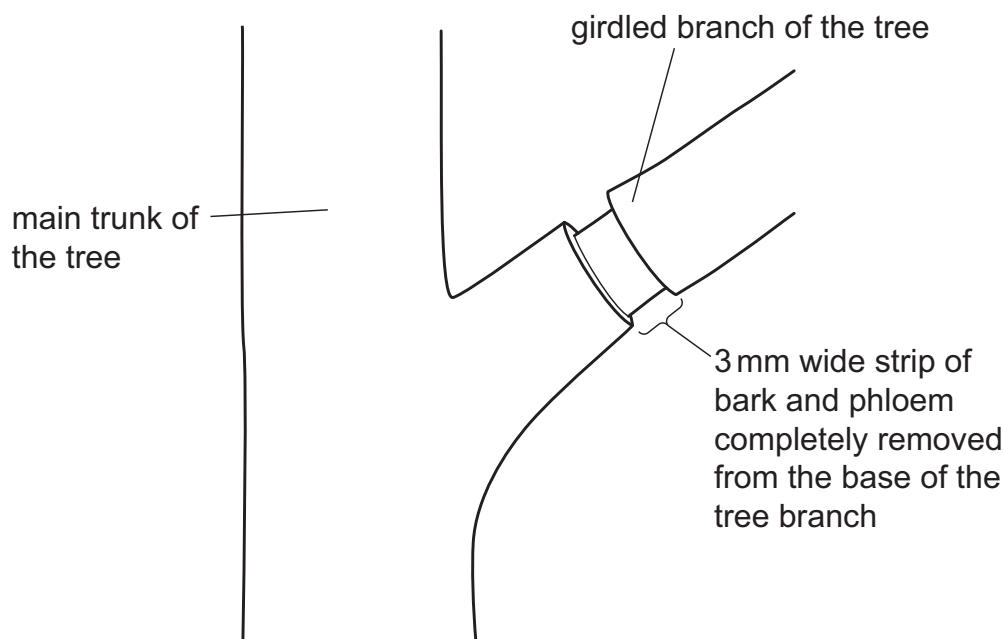


Fig. 2.3

The farmer girdled nine apple trees and left nine apple trees ungirdled.

The mass of ten fruits from the girdled trees and the mass of ten fruits from the ungirdled trees were compared.

Table 2.1 shows the results.

Table 2.1

treatment of trees	mass of ten fruits/g
girdled	1796
ungirdled	958

[5]

..... [1]

[Total: 16]

- 3 (a) Describe the pathway a water molecule takes from the soil to reach the xylem.

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..... [2]

- (b) A student investigated the effect of temperature on transpiration.

The student collected four small plants and placed them in beakers filled with water.

Fig. 3.1 shows the apparatus used.

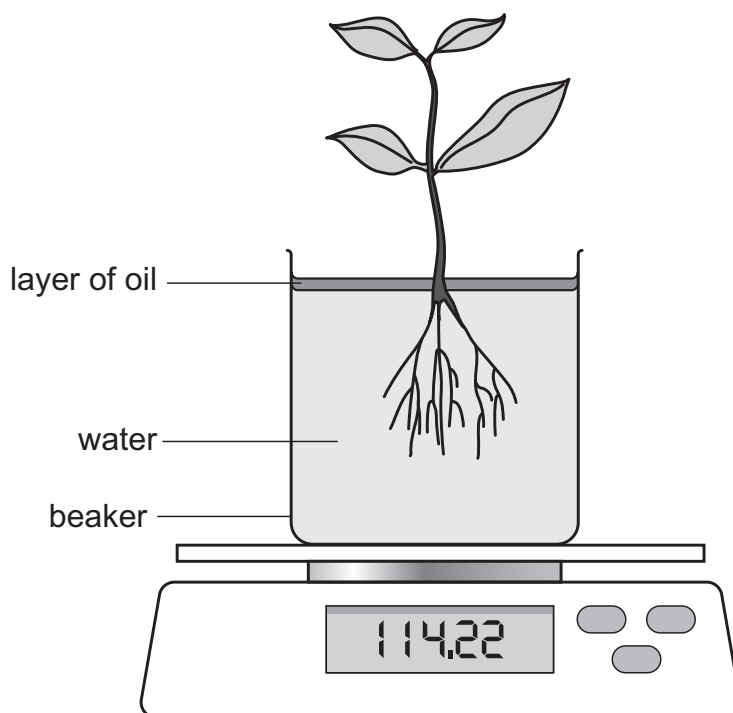


Fig. 3.1

For each plant, the student measured the initial masses of the equipment, water and plant.

Each plant was placed in a different temperature-controlled room for three hours.

After three hours, the student measured the final masses of the equipment, water and plants.

The results are shown in Table 3.1.

Table 3.1

temperature/°C	initial mass/g	final mass/g	transpiration rate /g per hour
15	138.2	135.5	0.9
20	136.1	132.5	1.2
25	137.8	128.5	3.1
30	135.7	118.3	

- (i) Using the information in Table 3.1, calculate the transpiration rate in the plant kept at 30 °C.

..... g per hour [1]

- (ii) Describe **and** explain the difference in the results for the plants kept at 15 °C and 25 °C.

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..... [4]

(iii) The investigation was repeated with a plant kept at 25 °C in a lower humidity environment.

Predict the effect of these conditions on the transpiration rate.

Explain your prediction.

[2]

(iv) Complete the sentences about water movement through the xylem.

The xylem transports water and .

Xylem cells form a long continuous with thick walls
containing cellulose and .

Water moves upwards in the xylem because of transpiration .

This draws up a of water molecules, held together by
between water molecules.

[6]

(c) (i) Explain why wilting occurs.

[3]

- (ii) Marram grass, *Ammophila arenaria*, is a xerophyte.

Fig. 3.2 is a photomicrograph of a cross-section of a marram grass leaf.

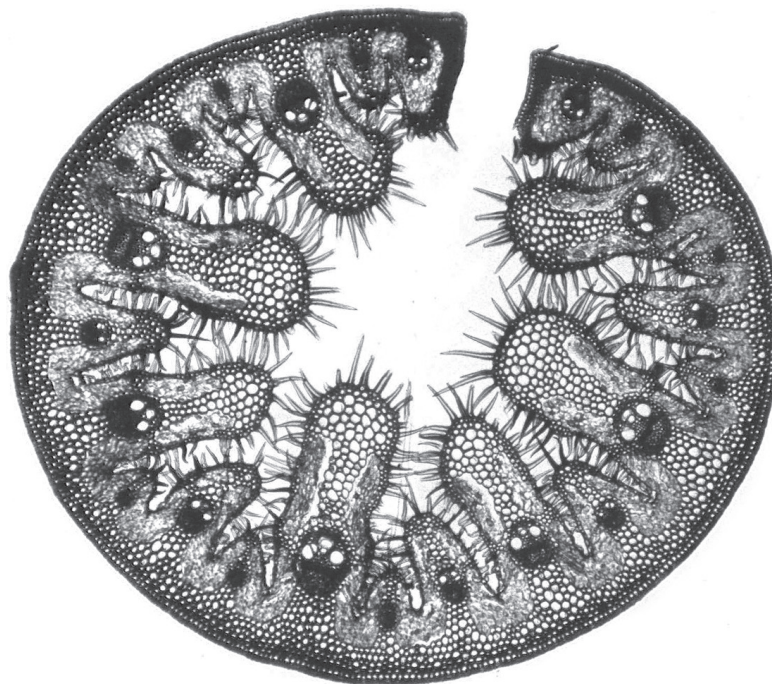


Fig. 3.2

Explain **one** way that the marram grass leaf shown in Fig. 3.2 is adapted to reduce transpiration.

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..... [2]

[Total: 20]

