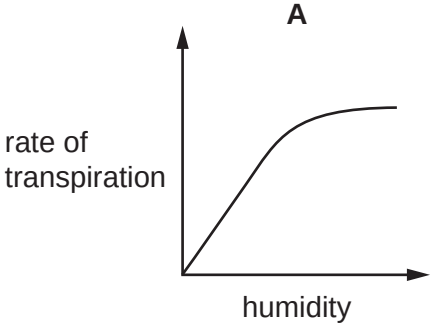
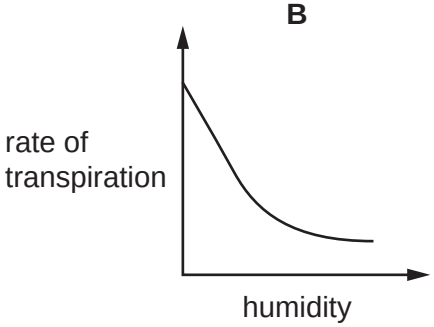
1 Which graph shows most clearly what will happen to the rate of transpiration as humidity increases?

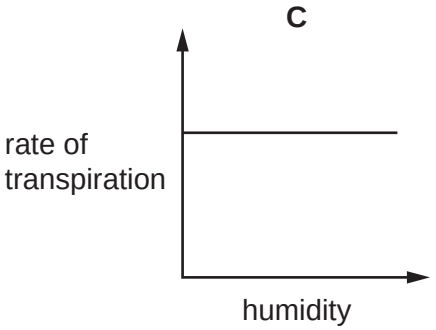
A



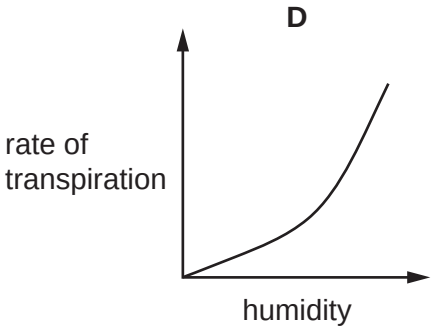
B



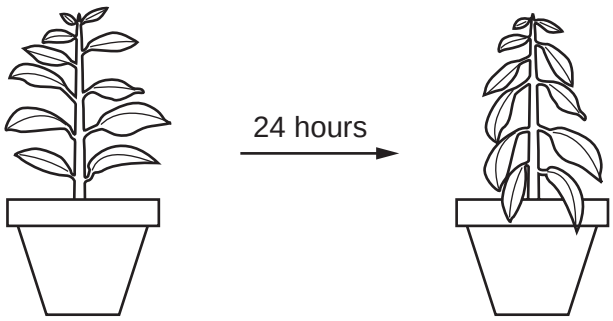
C



D



2 The diagram shows a potted plant and the same plant 24 hours later.



What causes the change in the appearance of the plant?

A Water loss is greater than water uptake.

B Water moves from the leaves to the stem.

C Water uptake is equal to water loss.

D Water uptake is greater than water loss.

3 By which process is water lost from a leaf?

A active transport

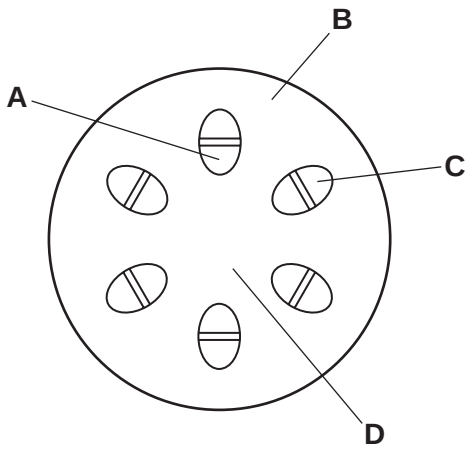
B diffusion

C osmosis

D photosynthesis

4 The lower end of a plant stem is placed in water coloured with red dye. After three hours, the stem is cut as shown in the diagram.

Which labelled region is stained red?



5 What is transported in the phloem and what is the direction of transport?

A starch, up and down

B starch, up only

C sucrose, down and up

D sucrose, down only

6 In which order does water pass through the cells of a plant, as the water travels from the roots to a leaf?

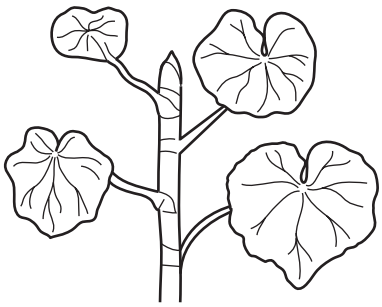
A mesophyll cells → root hair → root cortex → xylem

B root cortex → root hair → xylem → mesophyll cells

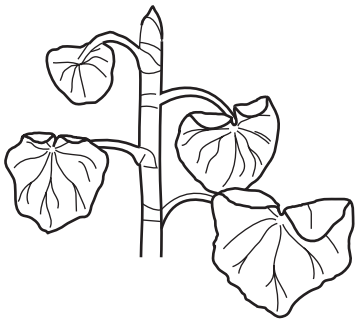
C root hair → mesophyll cells → root cortex → xylem

D root hair → root cortex → xylem → mesophyll cells

7 The diagram shows a plant shoot and the same shoot six hours later.



plant shoot



same shoot six hours later

Which change in environmental conditions could cause this change in the shoot?

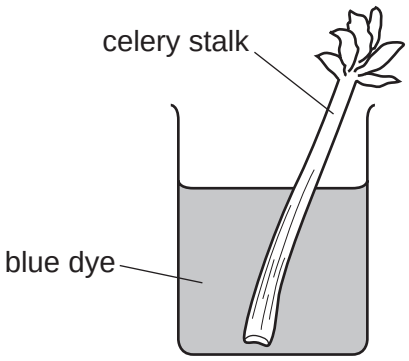
A a decrease in available water

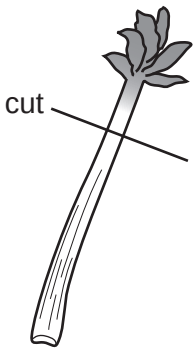
B a decrease in light intensity

C a decrease in wind speed

D an increase in humidity

8 A celery stalk is placed in a beaker of blue dye. Once the dye reaches the leaves, the stalk is taken out and cut in half.

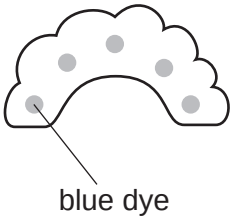




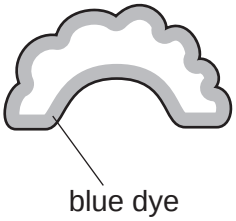
Which diagram shows the appearance of the cut end of the stalk?

A

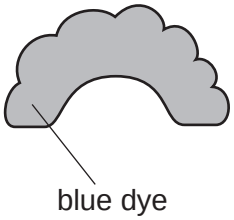
B



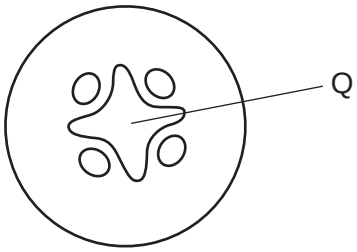
C



D



9 The diagram shows a cross-section through a plant root.



Q shows the part that is stained red when the root is placed in water containing a red dye.

What is found at Q?

A guard cells

B palisade cells

C phloem

D xylem

10 Which processes produce a continuous space for the flow of water in xylem vessels?

	break down of the cell walls between adjacent cells	removal of the cytoplasm in each cell
A	yes	yes
B	yes	no
C	no	yes
D	no	no

11 Some liquid is collected from the xylem in the stem of a plant.

What is present in the liquid?

A cellulose

B inorganic ions

C starch

D sugar

12 What is a function of phloem?

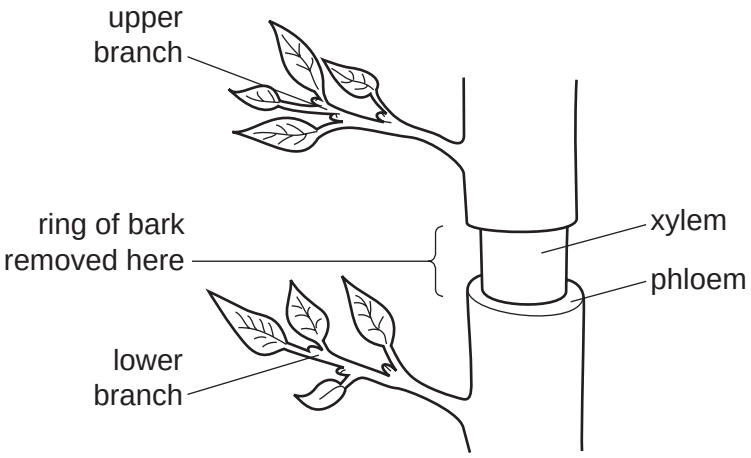
A translocation

B transpiration

C storage of food

D support

13 The diagram shows part of the trunk of a small tree with a ring of bark removed. Removing the ring of bark takes away phloem but leaves the xylem intact.



What effect will removing the bark have on the two branches?

	lower branch		upper branch	
	growth	leaves	growth	leaves
A	normal	normal	normal	wilted
B	normal	wilted	normal	normal
C	reduced	normal	normal	normal
D	reduced	wilted	reduced	wilted

14 The table shows some characteristics of four different plants.

The plants are growing in the same environmental conditions.

Which plant will have the highest rate of transpiration?

	number of leaves on plant	average surface area of one leaf / cm^2	average density of stomata on leaves / per mm^{-2}	average diameter of one stoma / µm
A	12	42	248	19
B	25	20	250	16
C	35	52	275	18
D	36	45	150	15

15 A decrease in which factor normally causes transpiration rate to increase?

A humidity

B light intensity

C stomatal opening

D temperature

16 What is the path of water through a plant?

A cortex cells → xylem → stomata → roots

B root hair → xylem → mesophyll cells → stomata

C roots → cortex cells → stomata → phloem

D roots → root hair → stomata → xylem

17 In which order does water pass through these tissues in a plant?

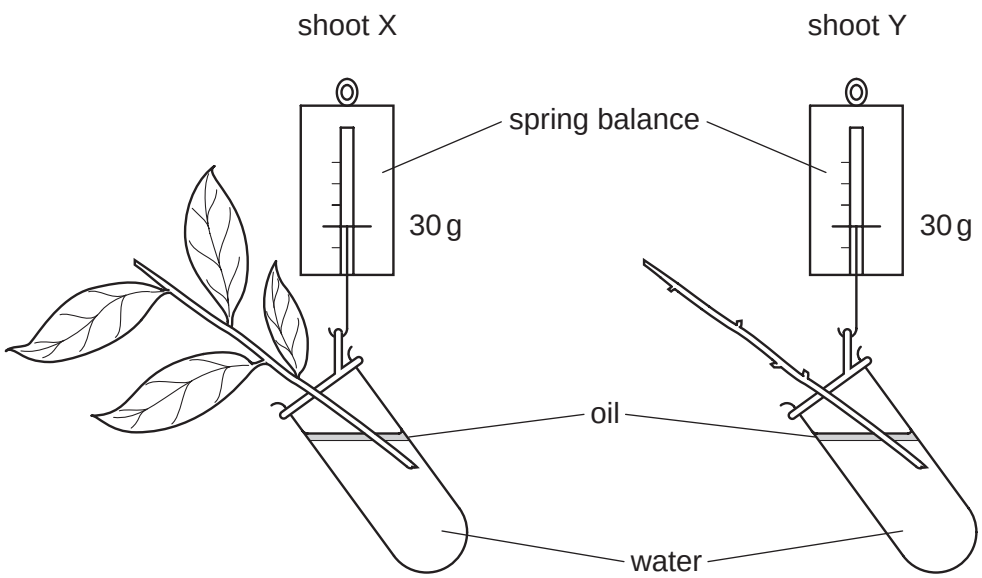
A mesophyll → xylem → root cortex

B root cortex → mesophyll → xylem

C root cortex → xylem → mesophyll

D xylem → mesophyll → root cortex

18 The diagram shows two shoots at the start of an experiment on transpiration.



What are the likely readings on the spring balances after three days?

	shoot X	shoot Y
A	30 g	30 g
B	30 g	25 g
C	25 g	30 g
D	25 g	25 g

19 Which statements about plant transpiration are correct?

	plants transpire most when	plants transpire least when
A	air is dry	temperature is high
B	light intensity is high	air is humid
C	light intensity is low	temperature is low
D	temperature is cold	light intensity is high

20 The table shows the rate of water flow through a tree over a 12 hour period.

time of day	rate of flow / cm per hour
7:00	100
9:00	120
11:00	140
13:00	250
15:00	300
17:00	260
19:00	180

What conclusion can be drawn from the table?

A Between 7:00 and 17:00 hours the rate of flow continuously increases.

B The greatest increase in rate of flow in a two-hour period is between 11:00 and 13:00 hours.

C Water does not flow up through a tree at night.

D Water flow is affected by humidity.

21 Which words correctly complete the following sentence?

'Transpiration is the ……1…… of water at the surface of the ……2…… cells followed by the ……3…… of water vapour from the plant ……4…… .'

	1	2	3	4
A	active uptake	xylem	gain	stem
B	diffusion	guard	gain	root
C	evaporation	mesophyll	loss	leaves
D	osmosis	cuticle	loss	flower

22 What could increase the rate of water uptake by a shoot?

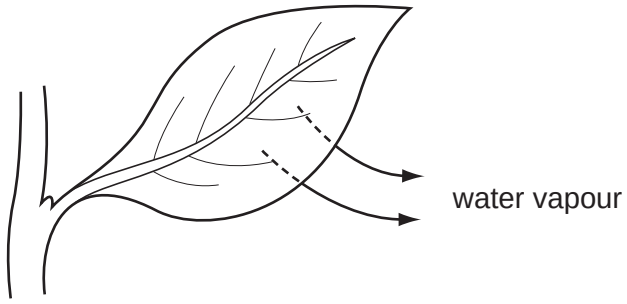
A covering the shoot with a black plastic bag

B covering the shoot with a clear plastic bag

C removing the leaves from the shoot

D shining a bright light onto the shoot

23 The diagram shows how water is lost from a leaf.



By which process is the water lost?

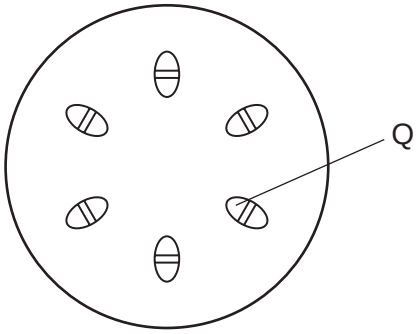
A osmosis

B photosynthesis

C translocation

D transpiration

24 The diagram shows a cross-section through a plant stem.



Q shows the part that is stained red when the stem is placed in water containing a red dye.

What is found at Q?

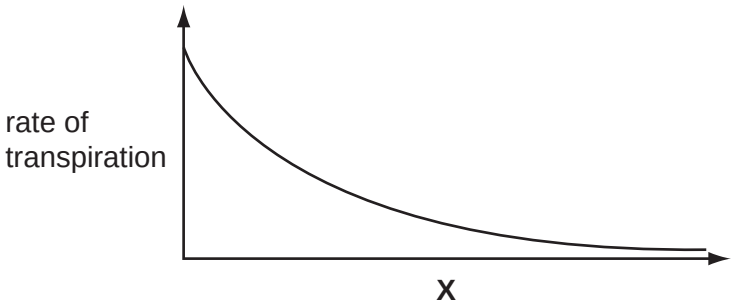
A guard cells

B palisade cells

C phloem

D xylem

25 The graph shows how the rate of transpiration is affected by **X**.



What is **X**?

A humidity

B light intensity

C soil moisture

D temperature

26 In what form does a plant absorb and lose water?

	absorbs	loses
A	liquid	liquid
B	liquid	vapour
C	vapour	liquid
D	vapour	vapour

27 In which order does water pass through these structures in a plant?

A mesophyll → root hair → xylem

B mesophyll → xylem → root hair

C root hair → mesophyll → xylem

D root hair → xylem → mesophyll

28 Which two substances are transported in the phloem?

A amino acids and protein

B amino acids and sucrose

C protein and starch

D starch and sucrose

29 What is a description of transpiration?

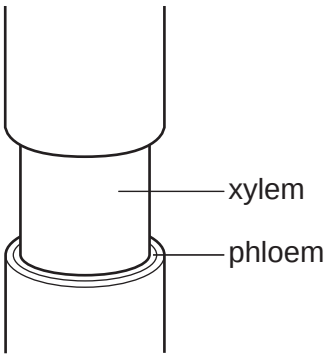
A exchange of gases between the leaf and the atmosphere

B loss of water vapour from the leaves and stems of a plant

C movement of water from the roots to the leaves

D movement of water through the cells of the leaf

30 The diagram shows the stem of a plant. A strip of the outer tissue including the phloem has been removed.



How is transport in the plant affected?

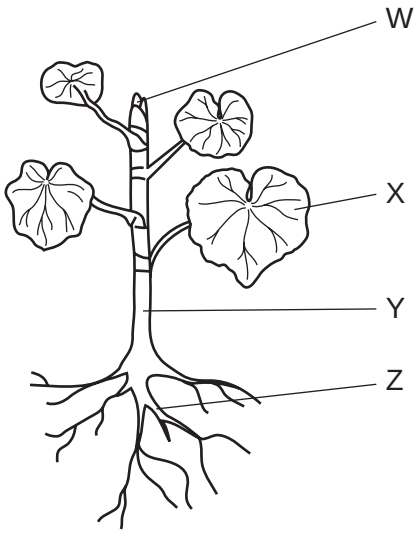
A Amino acids and sucrose cannot pass to the roots.

B Dissolved salts cannot pass to the leaves.

C Water cannot pass to the leaves.

D Water cannot pass to the roots.

31 The diagram shows a plant.



What is the pathway taken by most of the water absorbed by this plant?

A $X \rightarrow Y \rightarrow Z$

B $W \rightarrow Y \rightarrow Z$

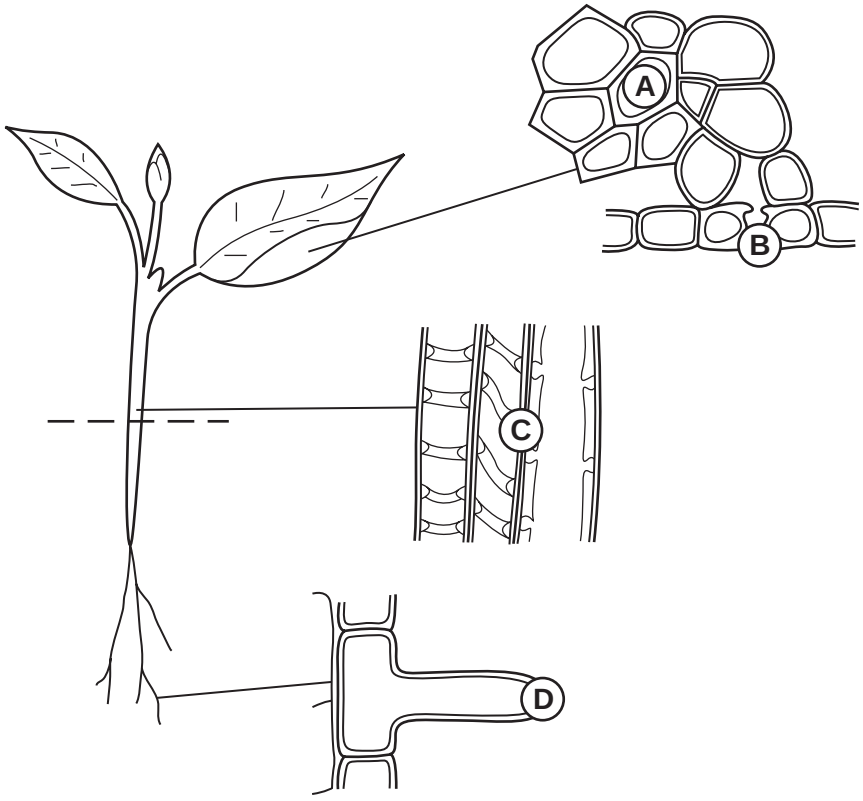
C $Z \rightarrow Y \rightarrow X$

D $Z \rightarrow Y \rightarrow W$

32 The diagrams show stages in the passage of water through a plant.

The circles are the starting points for arrows to show the direction in which the water moves.

Which circle **must** have an arrow pointing downwards **only**?



33 Translocation occurs in phloem tubes. Aphids feed on the contents of phloem tubes.

What type of food would be lacking in their diet?

A amino acid

B fat

C sucrose

D water

34 Which two functions does xylem perform?

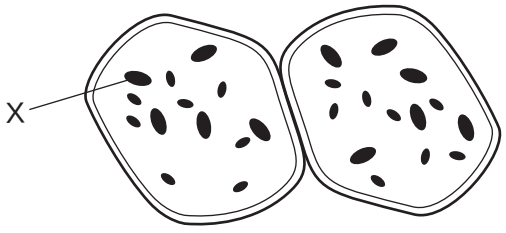
	absorption	conduction	contraction	support
A	✓	✗	✓	✗
B	✓	✓	✗	✗
C	✗	✗	✓	✓
D	✗	✓	✗	✓

key

✓ = performs

✗ = does not perform

35 The diagram shows cells from a storage organ of a flowering plant after they have been stained with iodine solution.



Structures X stain black.

What does this show that structures X contain?

A chlorophyll

B fat

C starch

D sugar

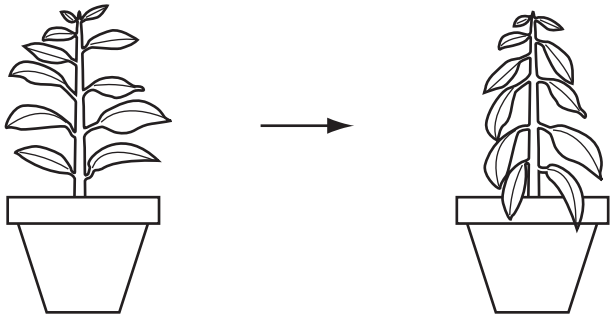
36 What shows the correct translocation of carbohydrate in a potato plant that is growing in bright sunlight?

	source of carbohydrate	type of carbohydrate translocated	destination of carbohydrate
A	leaves	glucose	tubers
B	leaves	sucrose	tubers
C	tubers	glucose	leaves
D	tubers	sucrose	leaves

37 Which conditions of humidity, light intensity and temperature make transpiration slowest?

	humidity / %	light intensity	temperature / °C
A	10	high	4
B	10	low	14
C	80	high	14
D	80	low	4

38 The diagram shows how the appearance of a potted plant changes over a period of four days.



Which environmental conditions are most likely to cause this change?

	humidity	light intensity
A	high	high
B	high	low
C	low	high
D	low	low

39 The table shows four substances and the parts of the plant to which they are transported.

	substance	part of plant
1	amino acids	flower buds
2	carbon dioxide	leaf cells
3	sucrose	root cells
4	water	stomata

Which are examples of translocation?

A 1 an **B** 1 and 3 **C** 2 and 4 **D** 3 and 4