1. Transport in Plant

(Past Year Topical Questions 2010-2015)

May/June 2010 (11)

9 On a dry, sunny day, how does water vapour move through the stomata of a leaf?

A into the leaf by diffusion

B into the leaf by osmosis

C out of the leaf by diffusion

D out of the leaf by osmosis

16 What is a description of transpiration?

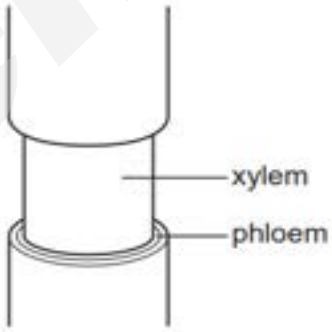
A exchange of gases between the leaf and the atmosphere

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

17 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.

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May/June 2011 (11)

17 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

18 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

Oct/Nov 2011 (11)

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

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

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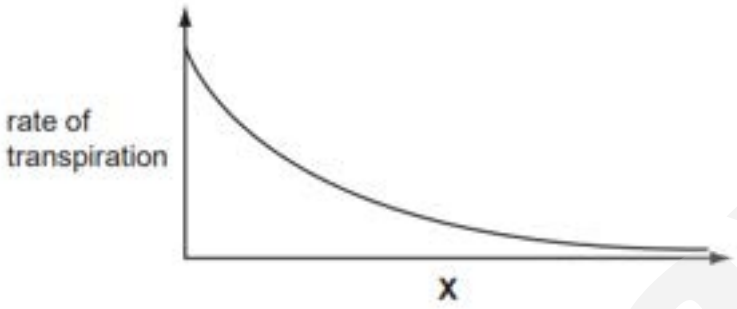
May/June 2012 (12)

17 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

Oct/Nov 2012 (11)

16 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

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18 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

May/June 2013 (11)

19 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.

May/June 2013 (12)

17 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

Oct/Nov 2013 (11)

18 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

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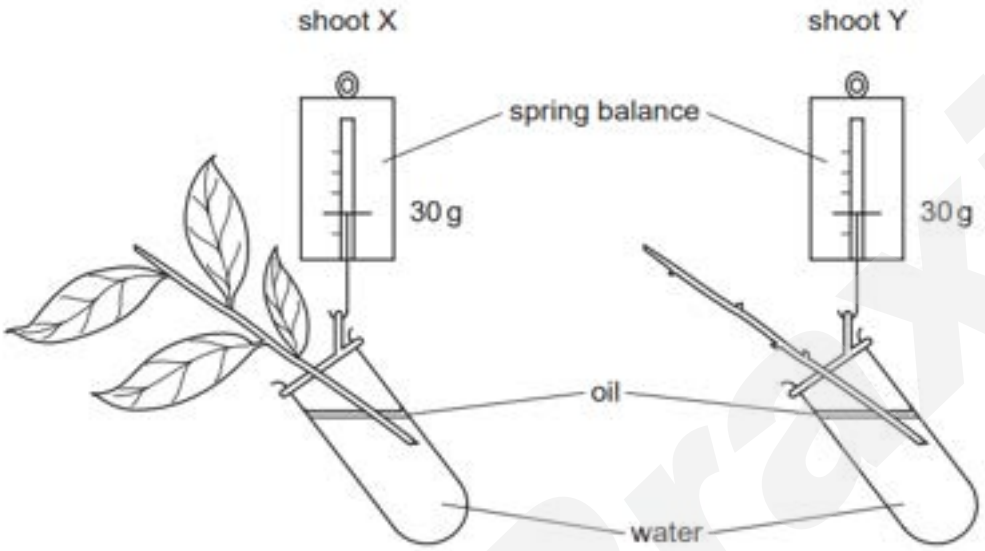
19 The diagram shows two shoots at the start of an experiment on transpiration.



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

Oct/Nov 2013 (13)

17 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

May/June 2014 (12)

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

A humidity

B light intensity

C stomatal opening

D temperature

18 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

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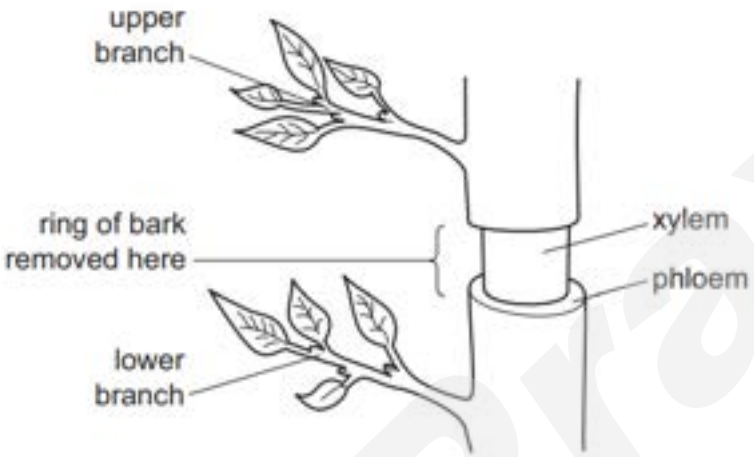
Oct/Nov 2014 (11)

17 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

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Oct/Nov 2014 (13)

17 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

May/June 2015 (12)

17 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.

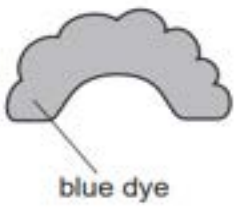
Which diagram shows the appearance of the cut end of the stalk?

A

B

C

D



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Oct/Nov 2015 (11)

18 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

Oct/Nov 2015 (12)

16 From which part of a leaf does most water evaporate during transpiration?

A the cuticle

B the guard cells

C the spongy mesophyll cells

D the xylem vessels

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