

0 1

Plants transport water and mineral ions from the roots to the leaves.

0 1 . 1

Plants move mineral ions:

- from a low concentration in the soil
- to a high concentration in the root cells.

What process do plants use to move these minerals ions into root cells?

[1 mark]

Tick **one** box.

Active transport

Diffusion

Evaporation

Osmosis

0 1 . 2

Describe how water moves from roots to the leaves.

[2 marks]

Question 1 continues on the next page

Plants lose water through the stomata in the leaves.

The epidermis can be peeled from a leaf.

The stomata can be seen using a light microscope.

Table 1 shows the data a student collected from five areas on one leaf.

Table 1

Leaf area	Number of stomata	
	Upper surface	Lower surface
1	3	44
2	0	41
3	1	40
4	5	42
5	1	39
Mean	2	X

0 1 . 3 Describe how the student might have collected the data in **Table 1**.

[3 marks]

0 1 . 4

What is the median number of stomata on the upper surface of the leaf?

[1 mark]

0 1 . 5

Calculate the value of **X** in **Table 1**.

Give your answer to 2 significant figures.

[2 marks]

Mean number of stomata on lower surface of leaf = _____

0 1 . 6

The plant used in this investigation has very few stomata on the upper surface of the leaf.

Explain why this is an **advantage** to the plant.

[2 marks]

Turn over for the next question

Question 1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.1	active transport		1	AO1/1 4.1.3.3
01.2	by transpiration stream / pull		1	AO1/1 4.2.3.2
	in xylem		1	AO1/1 4.2.3.1
01.3	any three in the correct order from: <ul style="list-style-type: none"> • mount epidermis on a slide • count stomata in one area • repeat in four more areas • repeat method on other surface of leaf • calculate mean 	allow nail varnish film	3	AO2/2 4.2.3.2
01.4	1	allow numbers written out in a line with middle number circled	1	AO2/2 4.2.3.2
01.5	$(44 + 41 + 40 + 42 + 39) / 5$ = 41.2		1	AO2/2 4.2.3.2
	41	allow 41 with no working shown for 2 marks allow 41.2 for 1 mark	1	AO2/2 4.2.3.2
01.6	less water lost		1	AO3/1a 4.2.3.2
	so it does not wilt		1	AO3/1b 4.2.3.2
Total			11	