



Leaves, water uptake and extreme environments: practice questions

4 questions • 13 marks • mark scheme at the back

For Edexcel GCSE Combined Science 1SC0. **Higher tier** is only on the Higher paper.

Name

Total / 13

- 1** Explain why a plant loses water faster on a windy day than on a still day. (2) [2 marks]

- 2** A student used a potometer to measure water uptake. In three repeats, the air bubble moved 45 mm, 41 mm and 49 mm in 5 minutes. Calculate the mean rate of water uptake in mm per minute. (3) [3 marks]

Answer =

- 3** A leafy shoot has a mass of 40.0 g. After one day, its mass is 37.0 g. Calculate the percentage loss of mass. (2) [2 marks]

Answer =

4 Explain how light intensity, air movement and temperature affect the rate of water uptake by a plant. (6) **[6 marks]**

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Mark scheme

One mark for each point unless a maximum is given. Words in brackets are not needed for the mark.

1. [2]

- moving air carries away water vapour from around the stomata / leaf (1)
- so the concentration gradient is steeper / water vapour diffuses out faster (1)

2. [3]

- $(45 + 41 + 49) \div 3 = 45$ mm (1)
- $45 \div 5$ (1)
- 9 mm per minute (1) allow 9.0; allow correct answer with unit for 3 marks; allow ecf from an incorrect mean

3. [2]

- $(40.0 - 37.0) \div 40.0 \times 100$ (1)
- 7.5% (1) allow correct answer with no working for 2 marks

4. [6]

Level 3 5-6	All three factors are covered with the correct effect on water uptake and a clear explanation linked to stomata, evaporation or the concentration gradient. Scientific terms are used accurately.
Level 2 3-4	The effect of two or three factors is stated, with some correct explanation.
Level 1 1-2	The effect of one or two factors is stated with little or no explanation.

Indicative content

- increasing light intensity increases the rate of water uptake because stomata open in the light
- more water vapour diffuses out of the leaf, so more water is pulled up the xylem
- increasing air movement increases the rate because water vapour is carried away from the leaf
- this keeps a steeper concentration gradient so water vapour diffuses out faster
- increasing temperature increases the rate because water evaporates faster from the cells
- water vapour particles also move faster, so diffusion out through the stomata is faster