



QUESTION WORKBOOK

Transpiration: the price of keeping the stomata open

Plant transport and mineral nutrition · Unit B08

AQA 3.3.2, 3.3.4.2 · OCR A 3.1.3 · Edexcel A Topic 4.1–4.4 · CAIE 7.2

6 questions · 22 marks

PRINT EDITION

SECTION A · Short, 1 to 2 marks

- A1** State the two steps by which water is lost from a leaf during transpiration, in the order in which they occur. [2]

SECTION B · Standard, 3 to 5 marks

- B1** In a potometer investigation the bubble travelled 18 mm in 10 minutes in still air and 47 mm in 10 minutes with a fan running. The capillary tube has an internal diameter of 1.0 mm. Calculate the rate of water uptake in moving air in $\text{mm}^3 \text{min}^{-1}$, and calculate the percentage increase in the rate of bubble travel caused by the fan. [5]

- B2** Explain how a guard cell opens a stoma in bright light, beginning with the proton pump in its plasma membrane. [5]

- B3** Explain why moving air over a leaf raises the rate of transpiration while raising the humidity of the air lowers it. [4]

- B4** Compare the effect of a rise in temperature on the rate of transpiration with the effect of a rise in humidity. [3]

- B5** A water lily has leaves that float on the surface of a pond, with their stomata on the upper surface rather than the lower. Suggest why the stomata are on that surface, and suggest one other feature you would expect such a leaf to show. [3]
