

Transpiration: practice questions

7 questions • 25 marks • mark scheme at the back

For Cambridge IGCSE Biology 0610 (and 0970, which has the same content). **Supplement** is Extended content, only examined on Papers 2 and 4.

Name

Total / 25

- 1** Describe how water leaves a leaf. [3 marks]

- 2** A student uses a potometer to investigate the effect of wind speed on the rate of transpiration. Describe how the student could do this. [4 marks]

- 3** In a potometer experiment, an air bubble moved the distances shown in the table. Calculate the rate of water uptake with the fan on, in mm / min. [2 marks]

Potometer results		
conditions	distance moved by bubble / mm	time / min
still air	18	6
fan on	54	6

Answer =

4

Supplement

[4 marks]

Explain how the structure of a leaf allows it to lose water vapour quickly.

5

Supplement

[5 marks]

Explain why a plant loses water vapour faster on a hot, dry, windy day than on a cool, humid, still day.

6

Supplement

[4 marks]

Explain how water moves up the xylem to the top of a tall tree.

7

Supplement

[3 marks]

Explain how and why wilting occurs.

Mark scheme

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

1. [3]

- water evaporates from the surfaces of the mesophyll cells (1)
- into the air spaces (1)
- water vapour diffuses out through the stomata (1)

2. [4]

- place a fan at different distances from the leafy shoot / use different fan speeds (1)
- measure the distance moved by the air bubble in a set time (1)
- keep other variables the same, for example temperature / light / same shoot (1)
- repeat and calculate a mean (1)

3. [2]

- $\text{rate} = \text{distance} \div \text{time} = 54 \div 6$ (1)
- 9 mm / min (1)

4. [4] **Supplement**

- mesophyll cells surrounded by interconnecting air spaces (1)
- gives a large internal surface area for evaporation (1)
- many / large stomata (1)
- water vapour diffuses out through the stomata (1)

5. [5] **Supplement**

- higher temperature, so water evaporates faster (1)
- molecules have more energy / diffuse faster (1)
- wind blows water vapour away from the leaf (1)
- keeps a steep concentration gradient (1)
- low humidity so the concentration gradient is steeper, so faster diffusion (1)

6. [4] **Supplement**

- water evaporates from mesophyll cells / leaves (1)
- creates a transpiration pull (1)
- water molecules are held together / attracted to each other (1)
- so the column of water is pulled up the xylem (1)

7. [3] **Supplement**

- water lost by transpiration faster than it is taken up (1)
- cells lose water (by osmosis) / lose turgor / become flaccid (1)
- so leaves / stems are no longer supported and droop (1)