

**0 4**

Water moves from a plant to the atmosphere through the leaves.

**0 4 . 1**

How is the volume of water lost from the leaves controlled?

**[1 mark]**

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**0 4 . 2**

Describe the transport of water through a plant from the roots to the atmosphere.

**[3 marks]**

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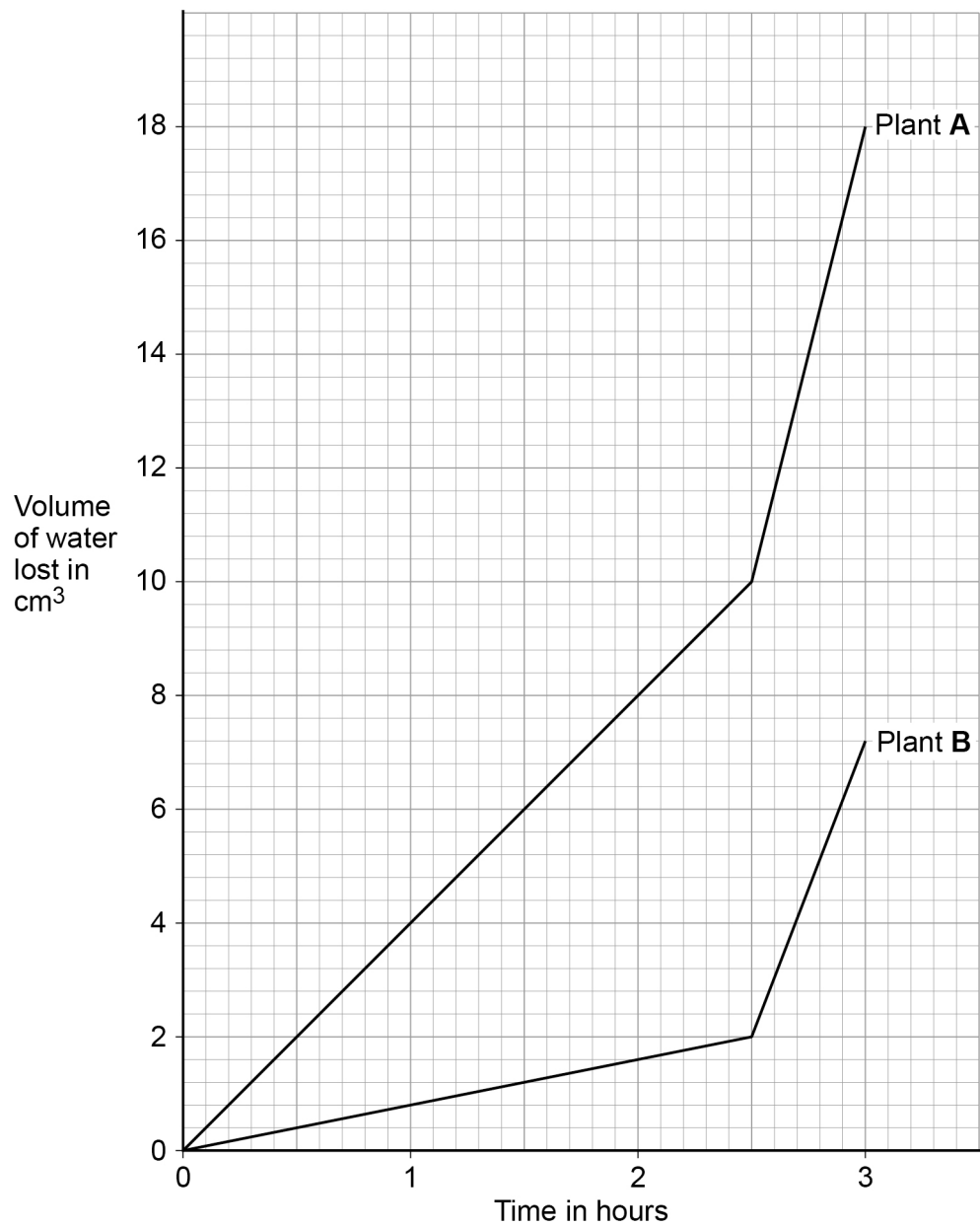
**Question 4 continues on the next page****Turn over ►**

A student investigated the volume of water lost from two plants of different species.

Both plants were kept together.

**Figure 5** shows the student's results.

**Figure 5**



0 4 . 3

Suggest **one** reason for the difference in the rate of water loss from the two plants in the first 2.5 hours.

[1 mark]

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Both plants were moved to a different place at 2.5 hours.

0 4 . 4

Calculate the rate of water loss per hour in plant **B** from 2.5 hours to 3 hours.

Give your answer to **2** significant figures.

[3 marks]

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Rate of water loss = \_\_\_\_\_ cm<sup>3</sup>/hour

0 4 . 5

Suggest **two** reasons why the rate of water loss in both plants changed after 2.5 hours.

[2 marks]

1 \_\_\_\_\_

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2 \_\_\_\_\_

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10

Turn over ►



| Question | Answers   | Extra information  | Mark | AO / Spec. Ref. |
|----------|---|--|------|-----------------|
| 04.1     | (by the guard cells) opening <b>and</b> closing the stomata   | ignore ref to guard cells being plasmolysed / turgid   | 1    | 4.2.3.2<br>AO1  |
| 04.2     | (water is) transported in xylem   | ignore mechanism of water entering the roots   | 1    | 4.2.3.2<br>AO1  |
|          | water evaporates (from leaves)  | do <b>not</b> accept translocation<br>allow loss of water vapour   | 1    |                 |
|          | through the stomata   | allow between the guard cells<br>if no other marks awarded allow <b>1</b> mark for reference to transpiration  | 1    |                 |
| 04.3     | any <b>one</b> from: <ul style="list-style-type: none"> <li>• plant <b>A</b> has more stomata</li> <li>• plant <b>A</b> has more leaves</li> <li>• plant <b>A</b> has bigger leaves</li> <li>• plant <b>A</b> has a greater total surface area of leaves</li> </ul> | allow converse for plant <b>B</b><br>allow (the plants) have different numbers of stomata<br>allow (the plants) have different numbers of leaves<br>allow (the plants) have different sized leaves<br>allow (the plants) have different total surface area of leaves<br>allow plant <b>A</b> has less (waxy) cuticle<br><b>or</b><br>(the plants) have different amounts of (waxy) cuticle<br>allow plant <b>A</b> has fewer hairs on leaves<br><b>or</b><br>(the plants) have different number of hairs on the leaves | 1    | 4.2.3.2<br>AO2  |

| Question     | Answers  | Extra information   | Mark                | AO / Spec. Ref. |
|--------------|--|---|---------------------|-----------------|
| <b>04.4</b>  | 5.2<br><br>(5.2 × 2 =) 10.4<br><br><b>or</b><br><br>$\left(\frac{5.2}{0.5} =\right) 10.4$<br><br>10 (cm <sup>3</sup> /hour)  | an answer of 10 scores <b>3</b> marks<br><br>allow in range 4.8 to 5.6<br><br>allow their calculated value in the range 8.8 to 12.0<br><br>allow their calculated value in the range 8.8 to 12.0 correct to 2 significant figures | 1<br><br>1<br><br>1 | 4.2.3.2<br>AO2  |
| <b>04.5</b>  | (rate increased because) any <b>two</b> from: <ul style="list-style-type: none"> <li>• (it was) warmer</li> <li>• light intensity was higher</li> <li>• (it was) less humid</li> <br/> <li>• (it was) windier</li> </ul> | answers must be comparative<br><br>allow greater water vapour gradient between leaves and environment   | 2                   | 4.2.3.2<br>AO3  |
| <b>Total</b> |  |   | <b>10</b>           |                 |