

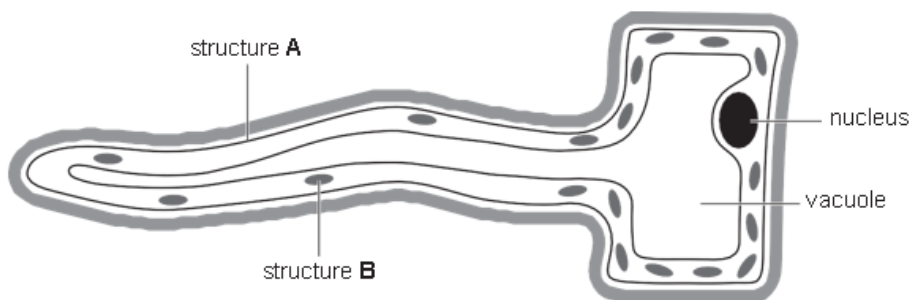
**GCSE Biology B (Twenty First Century Science)**  
**J257/02** Depth in Biology (Foundation)

**Question Set 5**

1 Nina is learning about substances absorbed by plants. She finds out that plants absorb nitrate ions from the soil.

- (a) Explain why nitrate ions are essential for plant growth and survival. [2]
- (b) Nitrate ions are absorbed into a plant root through root hair cells.

Nina finds this diagram of a root hair cell.



- (i) State the names of structures **A** and **B**. [2]
- (ii) Explain the roles of **A** and **B** in transporting nitrate ions into the root hair cell. [2]
- (iii) The shape of the root hair cell is an adaptation.

Explain how this adaptation helps the root hair cell to absorb nitrate ions more effectively. [2]

(c) The root hair cells also absorb water from the soil.

Complete the sentences below to describe how water is transported through a plant.

Choose the correct words from the list.

Each word may be used once, more than once or not at all.

**diffusion**      **flowers**      **meristem**      **osmosis** **phloem**

**stomata**                                      **xylem**

Water is transported from the soil into the root cells by .....

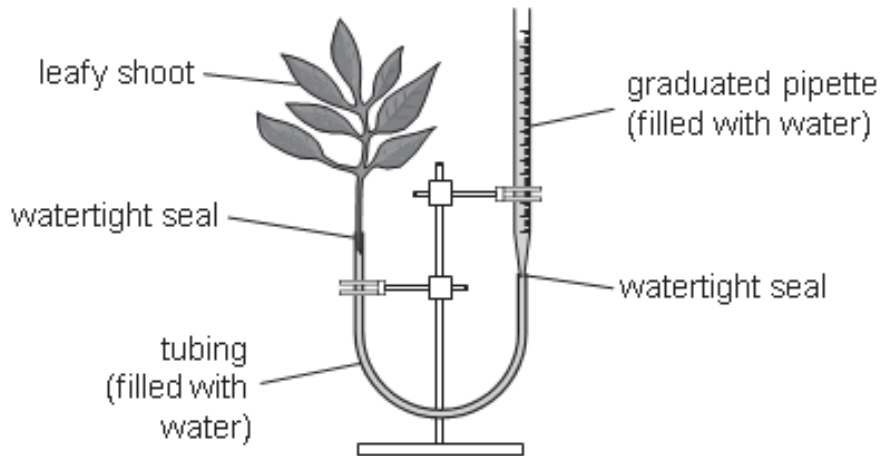
Water is pulled from roots to leaves through the .....tissue in the plant stem.

Water molecules are lost from the leaves into the atmosphere because of ..... through open .....

[4]

- (d) Nina wants to investigate how changing the light intensity affects the rate of water uptake by a leafy shoot.

She sets up a leafy shoot in a simple potometer as shown in the diagram.



Nina has access to other apparatus including:

**Fan      glass tank filled with water      lamp      metre ruler**

**small heater      stopwatch      thermometer**

She does **not** have to use all the apparatus.

Describe the experimental procedure Nina should follow and how she should process her results.

**[6]**

**Total Marks for Question Set 5: 18**

---

# OCR

Oxford Cambridge and RSA

## **Copyright Information**

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website ([www.ocr.org.uk](http://www.ocr.org.uk)) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact The OCR Copyright Team, The Triangle Building, Shaftesbury Road, Cambridge CB2 8EA.

OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge