

GCSE Biology B (Twenty First Century Science)
J257/04 Depth in biology (Higher Tier)

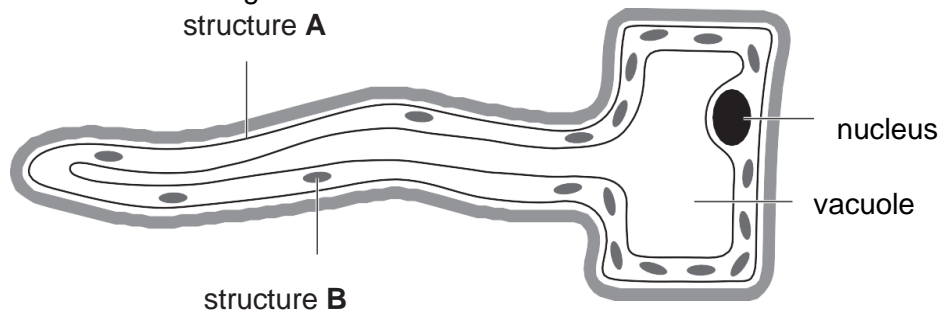
Question Set 1

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.

(b) Nitrate ions are absorbed into a plant root through root hair cells. Nina finds this diagram of a root hair cell.

[2]



(i) State the names of structures **A** and **B**.

(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.

[2]

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

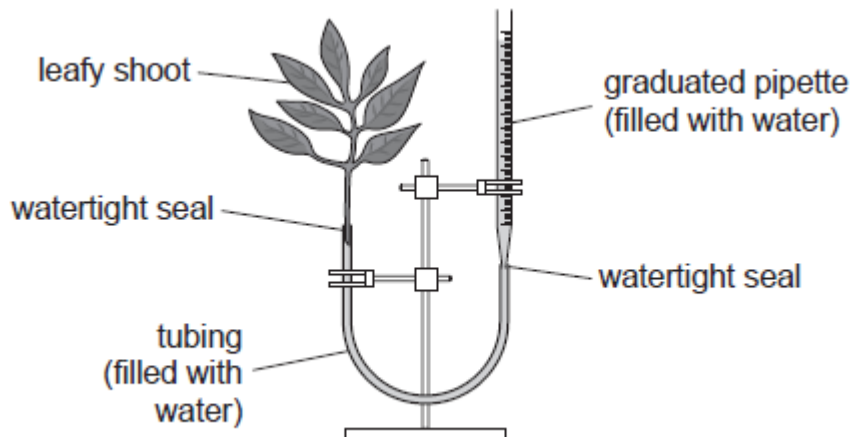
Water is pulled from roots to leaves through the tissue in the plant stem.

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 1: 18

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