

Exercise walk-through

Water uptake ■ 8.2

eXercise

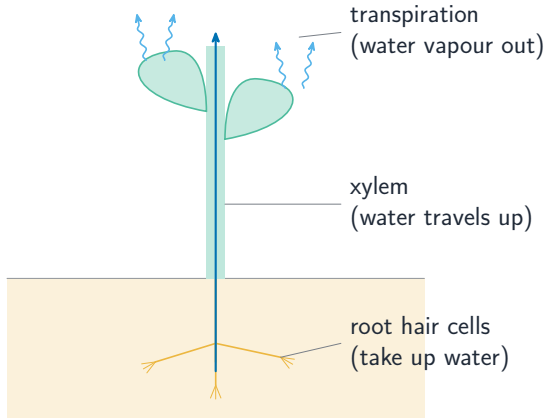
You must be able to

- describe how root hair cells take up water and mineral ions
- explain how root hairs increase the surface area
- state the water pathway through the plant

Method — Root hairs and the pathway

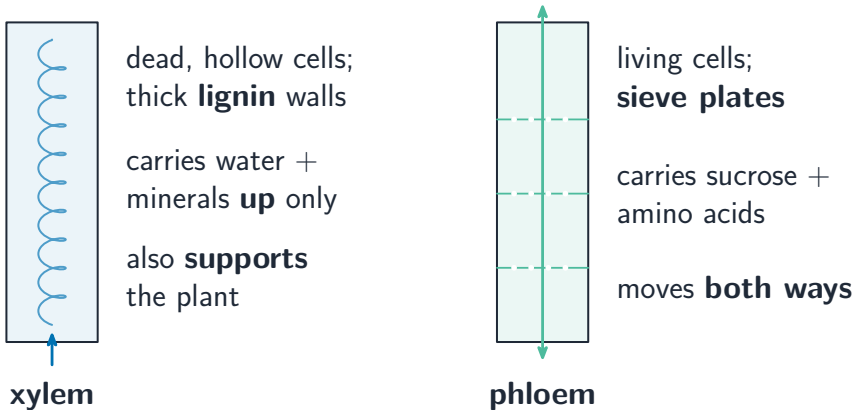
- many **root hairs** → very large surface area → fast uptake of water and mineral ions.

Method — Root hairs and the pathway



Water taken up by root hairs, up the xylem, lost from the leaves

Method — Root hairs and the pathway



Water taken up travels in the xylem

Practice 2.1 ■ 1 mark

Name the cells through which water enters a plant.

Solution 2.1

Method: Root hairs and the pathway

Worked steps

root hair cells **B1**.

Practice 2.2 ■ 2 marks

State the water pathway from the soil to the leaf.

Solution 2.2

Method: Root hairs and the pathway

Worked steps

root hair cell → root cortex → xylem → mesophyll (leaf) **M1** **A1**.

Exam-style 3.1 ■ 1 mark

Root hairs speed up water uptake because they:

- A** make food
- B** give a large surface area
- C** contain chloroplasts
- D** store starch

Solution 3.1

Method: Root hairs and the pathway

- A make food
- B give a large surface area 
- C contain chloroplasts
- D store starch

Worked steps

- B. Root hairs give a large surface area for uptake.

Exam-style 3.2 ■ 1 mark

A white flower is placed in water containing a coloured stain.

- (a) State where the stain will appear in the plant.
- (b) Explain why this shows the route taken by water.

Solution 3.2

Method: Root hairs and the pathway

Worked steps

(a) in the veins (xylem) / the petals **B1**.

(b) the stain is carried up the xylem with the water **M1**; so the coloured parts show the path the water took **A1**.