

Water uptake

Revision notes • How root hair cells absorb water and mineral ions, and the pathway water takes from the soil through the root and xylem to the leaf.

For Cambridge IGCSE Combined Science 0653. **Supplement** is Extended content, only examined on Papers 2 and 4.

Water uptake Spec B8.2

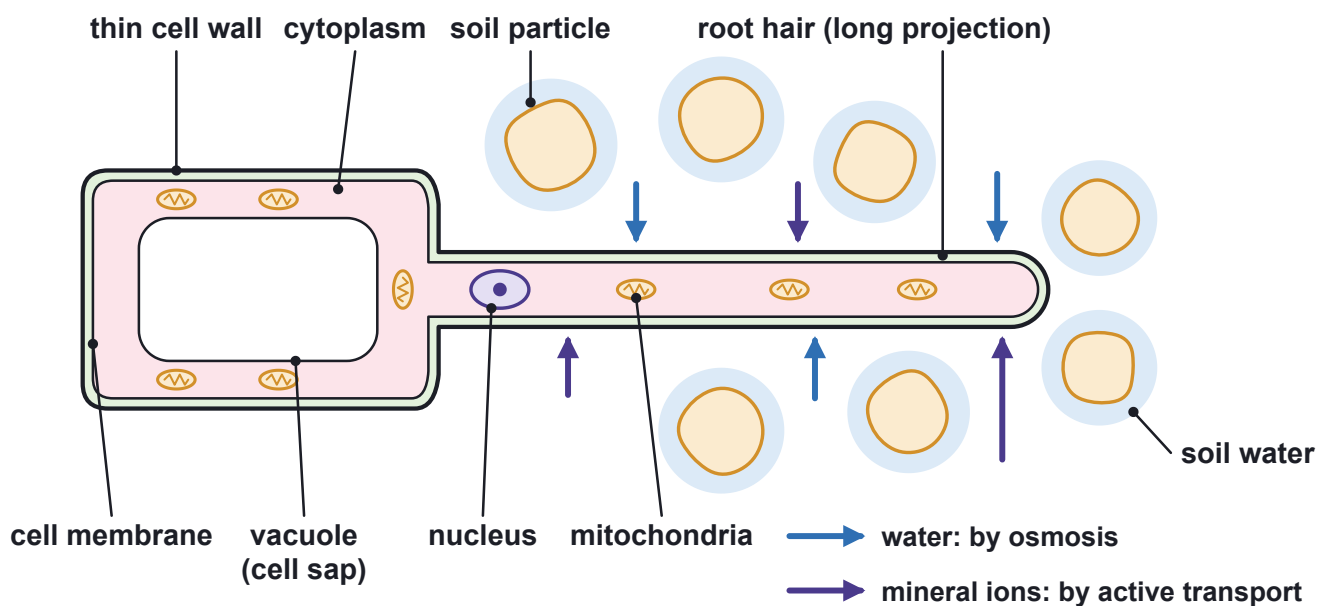
Root hair cells and the pathway of water Spec B8.2.1, B8.2.2, B8.2.3

Root hair cells

A **root hair cell** is a cell in the outer layer of the root that has a long, thin extension called the root hair. Its functions are to absorb water from the soil and to absorb mineral ions from the soil.

Supplement

The root hair gives the cell a **large surface area**, which increases the uptake of water and mineral ions.



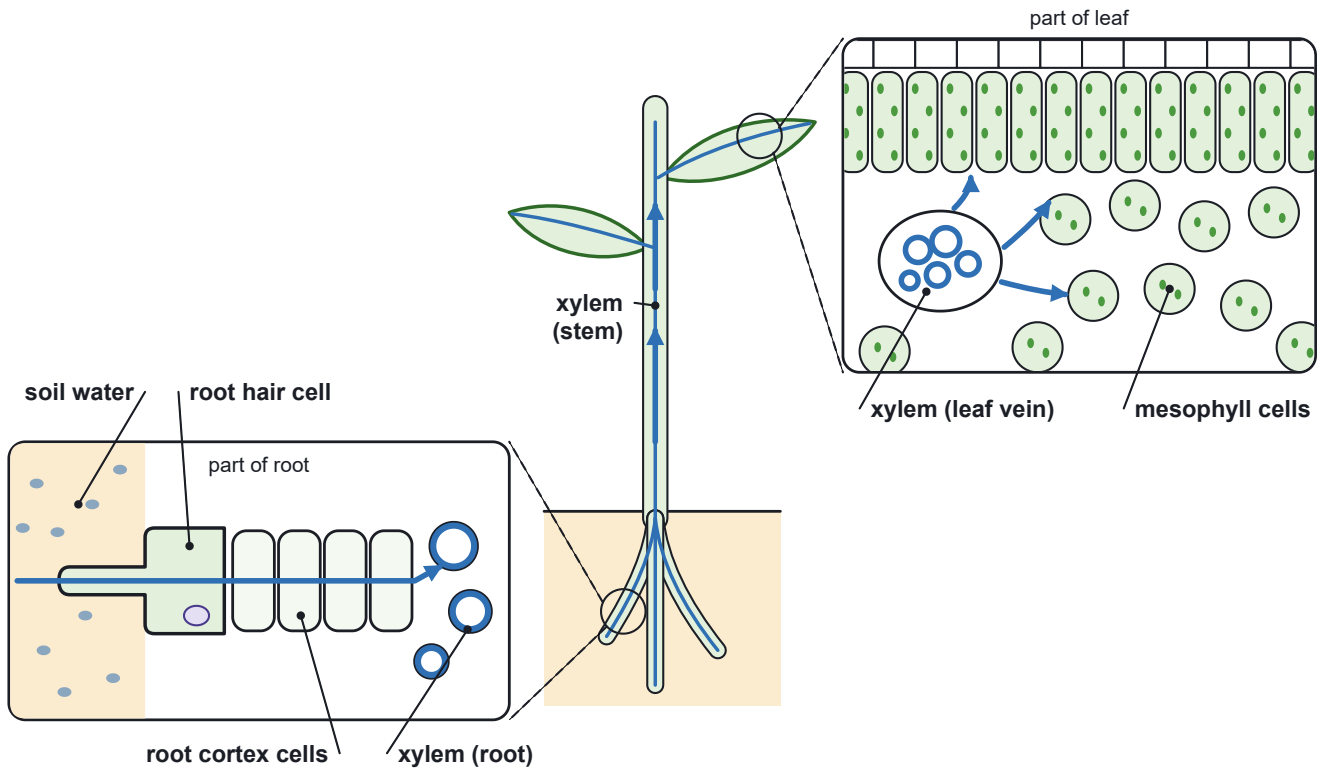
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A root hair cell. Its long extension gives a large surface area for absorbing water and mineral ions.

The pathway of water

Water takes the same route from the soil to the air. You need to be able to outline it.

1. Water enters the **root hair cells** from the soil.
2. It passes through the **root cortex cells**.
3. It enters the xylem and moves up the root and stem.
4. It leaves the xylem in the leaf and reaches the **mesophyll cells**.



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Water moves from the soil into the **root hair cells**, across the **root cortex cells**, up the **xylem** and into the **mesophyll cells**.

Exam tip: Give the cells in the right order: root hair cells, root cortex cells, xylem, mesophyll cells.

Writing 'roots to leaves' alone will not score.

Quick check

1. What do root hair cells absorb?
2. **Supplement** Why does a root hair increase uptake?
3. Give the pathway of water in order.

Quick check answers

Water uptake

- 1 . Water and mineral ions.
- 2 . It gives the cell a large surface area.
- 3 . Root hair cells, root cortex cells, xylem, mesophyll cells.