

Absorption by Roots - Mechanism

Chapter 4: Absorption by Roots - Mechanism · Topic 1

Key Concept

Root hairs increase the surface area for absorption, allowing water to enter root cells by osmosis due to a concentration gradient.

Water and dissolved minerals move from the soil into root hair cells, then across the cortex to reach the xylem for transport upward.

Active transport is used to absorb certain minerals against their concentration gradient, requiring energy (ATP) from the root cells.

Understanding root absorption mechanisms helps explain how plants obtain nutrients and water necessary for photosynthesis and growth.

Quick Revision Notes

- Root hairs increase surface area for absorption.
- Water enters by osmosis (concentration gradient).
- Water/minerals move: root hair → cortex → xylem.
- Xylem transports water upward.
- Active transport absorbs minerals against gradient.
- This requires energy (ATP).
- This mechanism supplies nutrients for growth.
- It's essential for photosynthesis and survival.

Practice Questions

- 1 Diagram the pathway of water from root hair to xylem.
- 2 Explain how osmosis helps water absorption.
- 3 Discuss why active transport requires energy.
- 4 Research the structure of a root hair cell.
- 5 Discuss why root hairs increase absorption efficiency.
- 6 Explain root absorption in your own words.