

Name _____

The Remarkable Journey of Water and Nutrients: How Plants Absorb Vital Elements

Open-Ended Response Answer Key

1. Water enters root hairs through osmosis, moving from an area of high concentration in the soil to an area of low concentration inside the root hairs. From there, it travels through the root cortex to xylem vessels, which transport it upward through the plant.
2. Nutrient absorption by plants is crucial for various metabolic processes, including protein synthesis and cell growth. Essential nutrients like nitrogen, phosphorus, and potassium support plant growth, flowering, and fruit production.
3. Environmental factors such as soil moisture levels and nutrient availability can affect water and nutrient absorption by altering root physiology and soil chemistry. Strategies for optimizing uptake include mulching to retain soil moisture and fertilizing to replenish nutrient levels.
4. The plant's ability to regulate water and nutrient absorption ensures efficient resource utilization and adaptation to changing conditions, contributing to its overall health and survival in diverse environments.

