The Incredible Journey of Nutrients

Learning objective: To understand the functions of the parts of a flowering plant and how water and nutrients are transported.

Read the passage carefully and answer the questions below using full sentences. Refer back to the text to support your answers.

Bea the honeybee loves to buzz around the meadow, observing how plants thrive. She knows that a plant's survival depends on a complex internal transport system. Deep underground, roots act like anchors, but their most important job is absorbing water and essential mineral nutrients from the soil. Once inside, these liquids travel upwards through tiny, tube-like structures called xylem. This movement is often described as a 'water column' that stretches from the soil all the way to the highest leaf.

In the leaves, the plant performs photosynthesis, using sunlight to create glucose. Meanwhile, water evaporates through tiny pores on the underside of leaves, known as stomata. This process, called transpiration, creates a pull that draws more water up from the roots, much like sipping through a straw. Bea marvels at this botanical engineering; without this constant flow of water and nutrients, the plant would wilt and be unable to produce the nectar she searches for. It is a perfect, natural cycle that keeps our entire ecosystem green and healthy.

Word bank: xylem · photosynthesis · stomata · transpiration · vascular · nutrients

1. According to the text, what are the two main jobs of a plant's roots? (2 marks)

2. What is the specific name of the structures that transport water upwards through the plant? (1 mark)

3. Explain why the plant requires the process of transpiration to survive. (2 marks)

4. Why does the author use the metaphor of 'sipping through a straw' to describe transpiration? (2 marks)

5. Bea suggests that the plant's transport system is a 'perfect cycle'. To what extent do you agree with this, and why? (3 marks)

Draw: Draw a diagram of a flowering plant. Label the roots, the xylem (inside the stem), the leaves, and the stomata on the underside of a leaf. Add arrows to show the direction of water movement.

Extension challenge: Research how environmental factors like high temperatures or strong winds might affect the rate of transpiration in a plant. Write three sentences explaining your findings.