

A Level Transport in Plants Key Words

Key Word	Definition
Xylem tissue	Transports water and mineral ions in solution AND supports the plant. Transport is from the roots to the leaves
Phloem tissue	Transports sugars mainly, but also hormones and amino acids. It's a 2 way system
Cambium layer	Layer of meristem cells, which are undifferentiated cells for plant growth
Xylem vessel cells	Dead cells (no cytoplasm) that form hollow tubes with no cell end walls. Lignin thickens the cell walls to give strength. Small pits where there is no lignin, water and ions move in and out of the vessel through these pits
Lignin	Woody substance, thickens xylem cell walls
Sieve tube elements	Living cells but with very little cytoplasm and therefore organelles (no nucleus). They form the tube structure. They have cell end walls with holes in (for the sugars) called sieve plates
Companion cells	Carry out the living functions of the sieve tube element e.g. they contain lots of mitochondria to provide energy
Osmosis	Movement of water from a high to low water potential, no energy needed
Symplast pathway	Water moves through the living parts of cells (the cytoplasm) via osmosis
Plasmodesmata	Small channels in the cell walls to connect neighbouring cells
Apoplast pathway	Water moves through the non-living parts of cells (the cell walls) via osmosis
Casparian strip	Waxy strip in the cell walls of the endodermis cells in a root - forces water into the symplast pathway
Transpiration	The evaporation of water from the leaves
Transpiration stream	The movement of water from the roots to the leaves, this relies on cohesion, tension and adhesion
Cohesion	Water molecules are cohesive (stick together) so water moves up the xylem as a column

Tension	When water evaporates from the leaves this creates a tension (suction) which pulls more water into the leaf
Adhesion	Water molecules are slightly attracted to the walls of the xylem which helps water to rise up the xylem
Light intensity	Increased light = more stomata open for photosynthesis = increased transpiration rate
Temperature	Increased temp = water molecules have more energy and evaporate faster = increased transpiration rate
Humidity	Increased humidity = lower water potential gradient between the leaf and air = decreased transpiration rate (dry conditions = increased water potential gradient between leaf and air = increased transpiration rate)
Wind	Increased wind = increased water potential gradient as the wind blows the water molecules around the stomata away = increased transpiration rate
Potometer	Estimates transpiration rates (actually measures water uptake)
Xerophytic plants/Xerophytes	Plants that are adapted to live in dry climates e.g. cacti and marram grass
Hydrophytic plants/Hydrophytes	Plants that are adapted to live in aquatic habitats with low oxygen levels e.g. water lilies
Translocation	The movement of dissolved substances (sugars, amino acids) to where they're needed in a plant. Movement happens in the phloem and requires energy
Assimilates	Dissolved substances are sometimes called assimilates
Source	Is where a substance is made (high concentration of it)
Sink	Is where a substance is used up (lower concentration of it there compared to the source)
Mass flow hypothesis	The best supported theory of how translocation works
Active loading	A process that happens at a source in a plant. Assimilates are moved against their concentration gradient into the phloem. Energy is needed.