



Transport in plants

Transport system is needed for the following reasons:

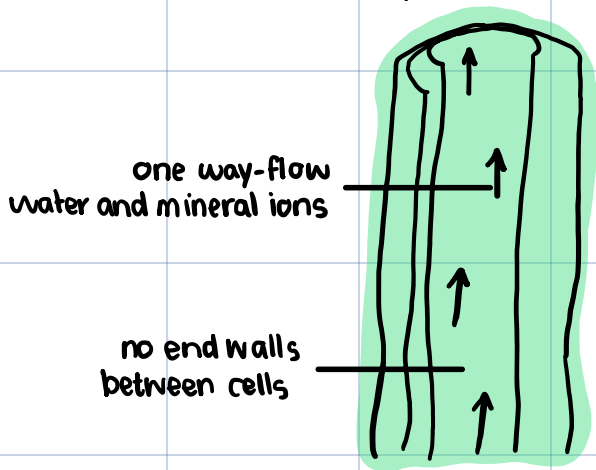
- o To move substance from where they are absorbed to where they needed. Water & minerals are absorbed by the root.
- o To move substance from where they are produced to where they are needed for metabolism. Sugars are produced in leaves \rightarrow xylem \rightarrow rest of plant.
- o To move substance to different part of the plant for storage.

Transport systems in plants are found in the vascular bundle. Allows transport of: water, minerals and products of photosynthesis

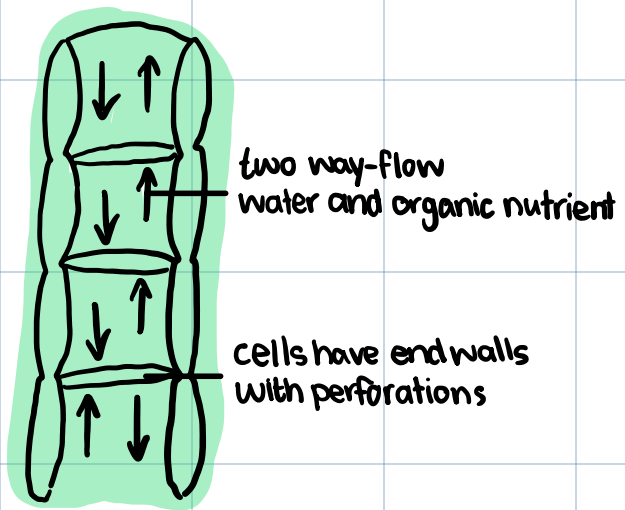
Plants have two transport systems:

- o Xylem; transport inorganic substance (water & inorganic minerals ions) from roots upwards to stem. Xylem sap can move only in one direction
- o Phloem that transports organic substance which have been made in plants (sucrose & amino acids). leaves \rightarrow rest of the plant to storage organs/to place where these substances are being used in metabolic reactions. Phloem sap can be moving in different directions parts of the plant.

Xylem vessel



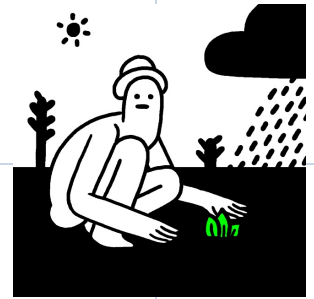
Phloem vessel



Transverse sections to show the structures of stem, roots and leaves of herbaceous dicotyledonous plant.

Dicotyledonous plants (dicots):

Plants with two cotyledons (seed leaves), board leaves, branching veins and taproot system.



Herbaceous plants:

Plants with no wood in their stems and roots.

Transverse (cross) section of leaves of herbaceous dicotyledonous plants

The upper epidermis of a leaf is a thin transparent layer which allow light to reach the mesophyll. It has a protective function and is covered with a waterproof cuticle to reduce loss of water. The lower epidermis contains pores (stomata) for gas exchange.

Collenchyma is a modified form of parenchyma with extra cellulose deposited at the corners of the cells. This provides extra strength. The midrib of leaves contains collenchyma.

The vascular tissue in leaves is arranged into **vascular bundles** that are found within the spongy mesophyll. 'Vascular' means having tubes for transporting fluids. The **xylem** is always found nearer to the upper leaf surface and phloem to the lower leaf surface. The **phloem** transports organic solutes made by photosynthesis, particularly sugars (sucrose) and amino acids. The **xylem** is there for mechanical strength and transport of water and mineral salts.