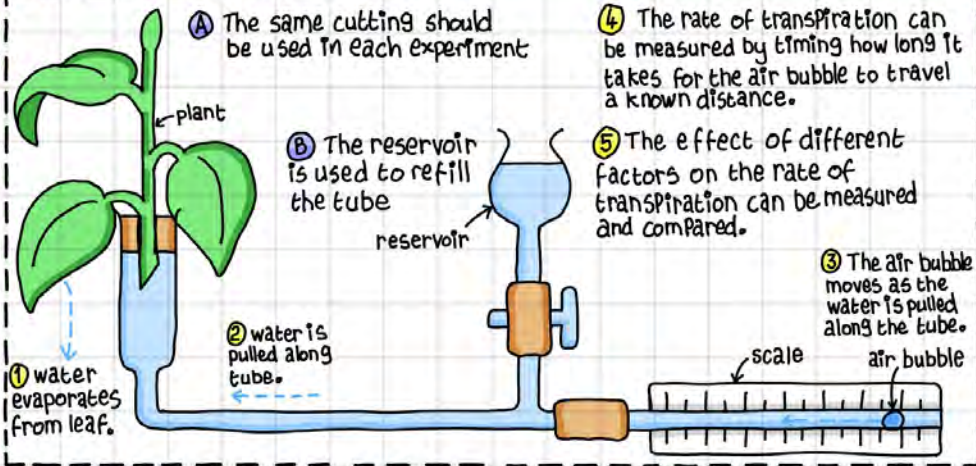
Transport in Plants

The Potometer — measuring the rate of transpiration



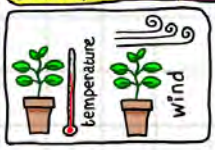
A The same cutting should be used in each experiment

B The reservoir is used to refill the tube

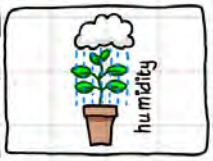
4 The rate of transpiration can be measured by timing how long it takes for the air bubble to travel a known distance.

5 The effect of different factors on the rate of transpiration can be measured and compared.

Transpiration factors



Increasing these factors increases the rate of transpiration



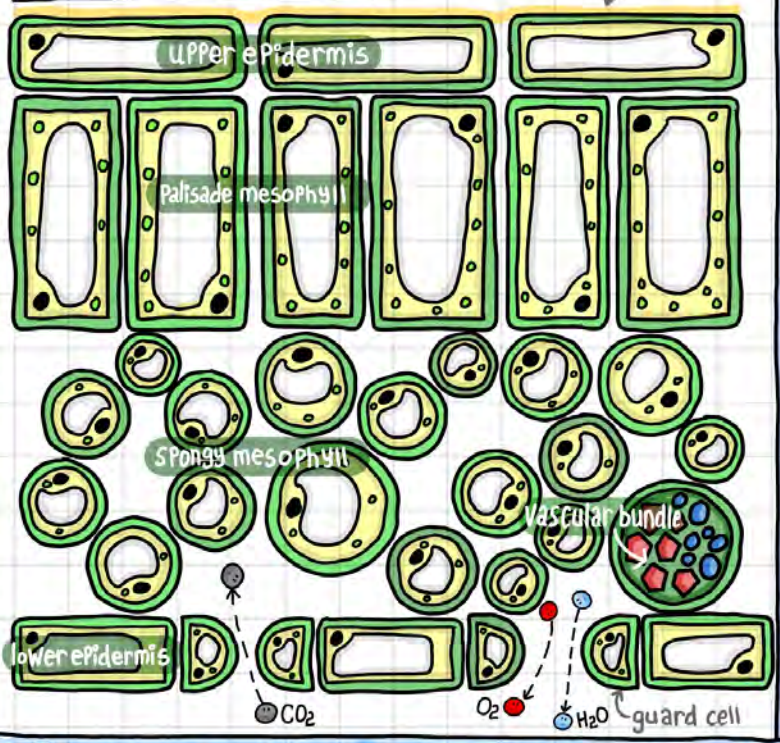
An increase in humidity leads to a reduced rate of transpiration

No transpiration occurs at night because the stomata are closed

Xylem — water transpiration

Water evaporates from the stomata in the leaves. This causes water molecules in the xylem to be pulled upwards.

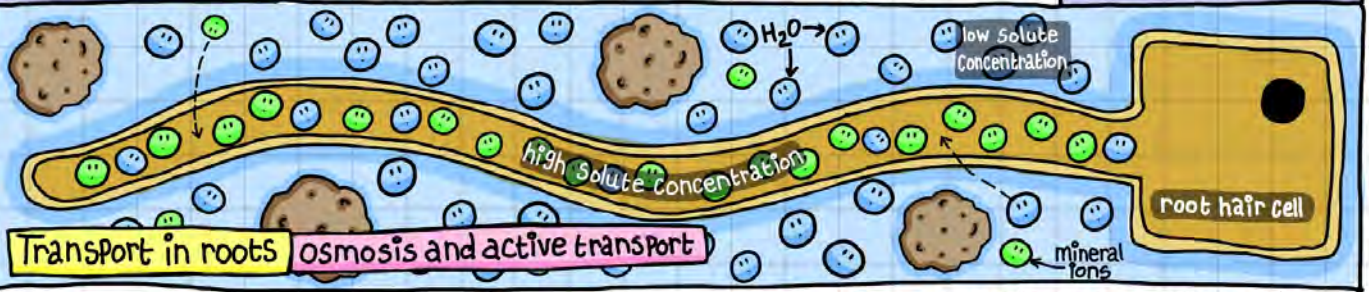
Cross section of leaf — organ



Phloem — sugar translocation

Sugars dissolved in sap can be moved up or down the plant through the phloem.

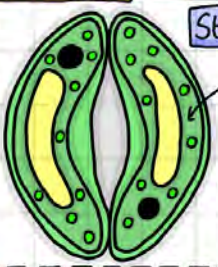
Transport in roots — osmosis and active transport



Inside the root is a high solute concentration of mineral ions. Outside the root is a dilute concentration of mineral ions. **Osmosis** takes place as water moves from a dilute solute concentration (outside) to a high solute concentration (inside). Mineral ions move from a low concentration (outside) to a high concentration (inside) by **active transport**. This process requires energy from **aerobic respiration**.

Stomata — gateway of transpiration

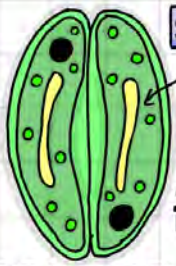
Stomata open



guard cells are turgid

Water and oxygen diffuse out carbon dioxide diffuses in.

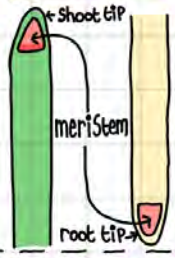
Stomata closed



guard cells are flaccid

when closed carbon dioxide cannot diffuse in so no Photosynthesis

Meristems — Plant stem cells



meristem cells are undifferentiated plant cells (stem cells). They are found at the growing tips of the plant (the shoot tip and the root tip).