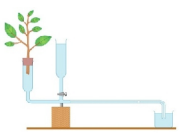
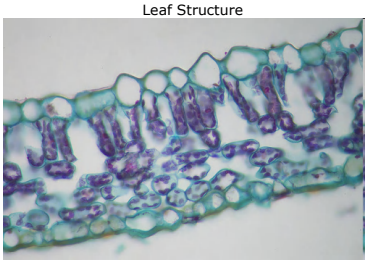
Slide 1

Potometer



Slide 2

Leaf Structure



Slide 3

Outline of photsynthesis

Plants absorb air through pores (stomata) in the leaves. The oxygen enters all cells, at all times and is used for respiration. Carbon dioxide is absorbed by leaf cells in the light and used up in photosynthesis to make carbohydrates. Plants also use the hydrogen in water to make sugars – the oxygen in water is a by-product of photosynthesis and can be used for respiration or it diffuses back into the air through the stomata.

Slide 4

Basic observation and hypotheses

Water moves along the capillary tube towards the plant. How come?

The plant is using water in photosynthesis.

The plant is losing water through the stomata which are open to allow carbon dioxide in for photosynthesis

This loss of water is called transpiration. Do you consider it a design fault on God's part?

Slide 5

Measurements under different conditions cool, warm and vaseline covered.

In cool air water moves along the potometer slowly it may stop if the stomata close. "Stress" i.e. cutting the stem may cause chemicals to be released that cause the stomata to close

In warm air the rate may speed due to lowering of humidity and if the air is moving by removal of the humid boundary layer.

With vaseline on the under-surface of leaves water movement invariably almost stops as most stomata are on the undersurface of leaves.

Slide 6

Reason for transpiration

Transpiration is a results of the opening of stomata for the absorption of gases for respiration and photosynthesis. It sets up a stream of water moving up the plant in the xylem which plants use to transport water soluble minerals.

Slide 7

Summary

Potometer set-up
Summary of photosynthesis
Basic observation
Possible explanations
Measurements under different conditions cool, warm and vaseline covered.
Graphs and calculations
Reasons for transpiration.
DVD of animation
Path of water through the plant. Root hairs endodermis, root and stem xylem, petiole xylem and veins to palisade mesophyll
TS of leaf.
Stomata and guard cells.