Cambridge O Level Biology

Your notes

6.2 Leaf Structure

Contents

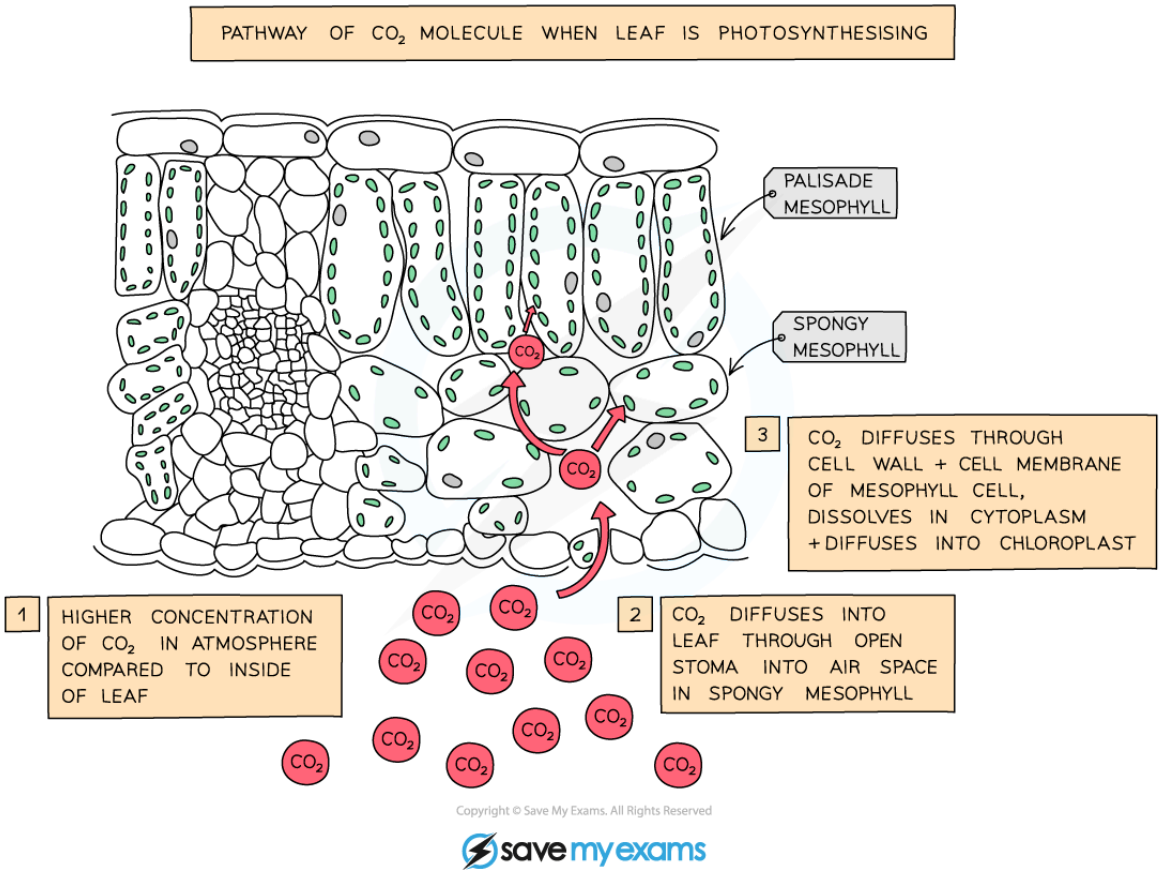
Leaf Structure

Your notes

Leaf Structure & Adaptations for Photosynthesis

- Leaves are plant organs that carry out **photosynthesis**
- Their structure is adapted to maximise photosynthesis, e.g.
  - They have a **large surface area** to maximise light absorption
  - They are **thin** to allow efficient movement of gases between leaf cells and the surrounding air

Leaf structure diagram



Leaves are adapted to carry out photosynthesis by being thin; this allows gases to diffuse quickly, e.g. carbon dioxide can diffuse quickly between the surrounding air and the photosynthesising cells of the leaf

Identifying Leaf Structures in a Dicotyledonous Plant

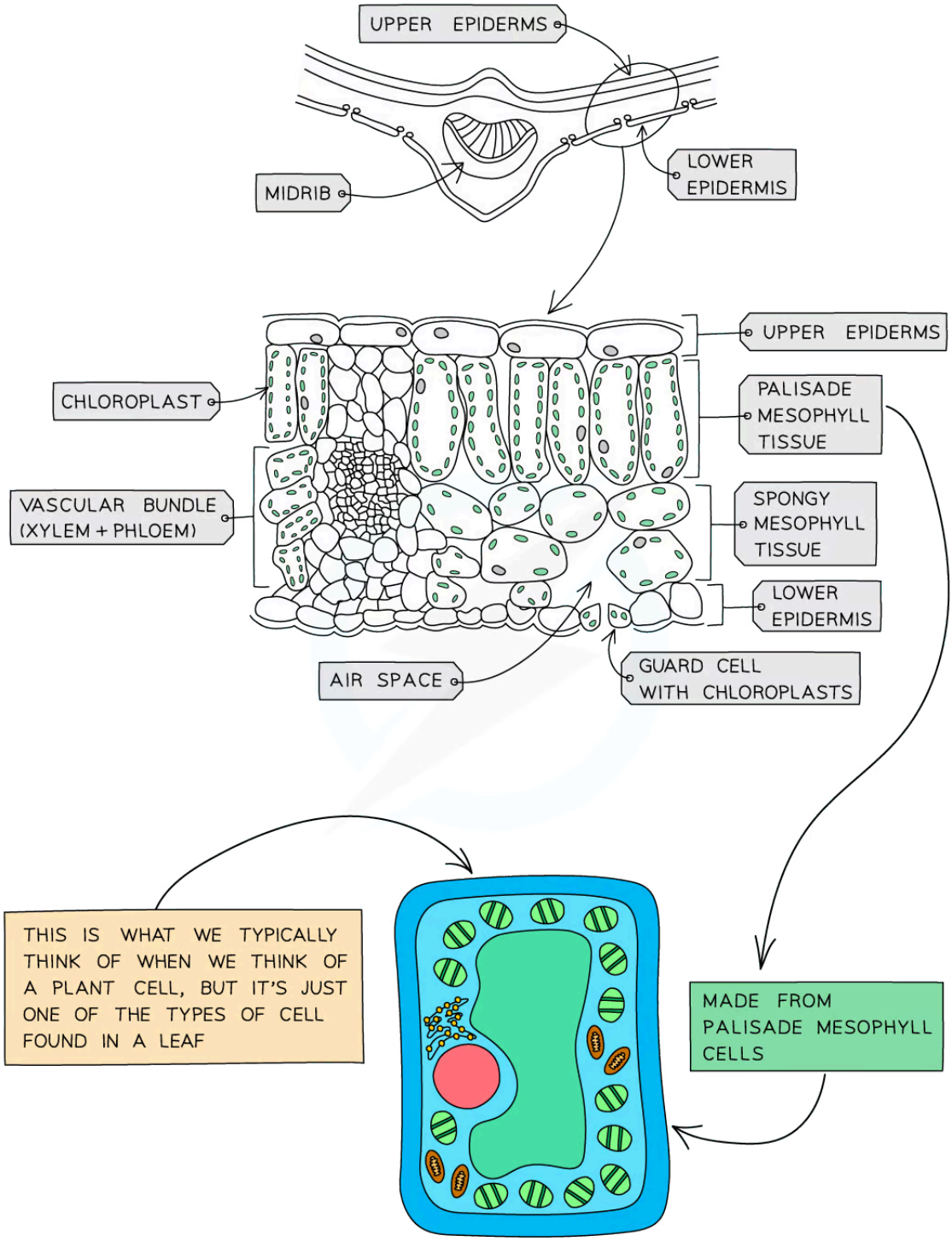
Your notes

Identifying Leaf Structures in a Dicotyledonous Plant

- Dicotyledonous plants are a group of flowering plants
- The following structures are present in the leaves of dicotyledonous plants:
  - Cuticle
  - Stomata
  - Guard cells
  - Spongy mesophyll
  - Palisade mesophyll
  - Air spaces
  - Vascular bundles
    - Xylem
    - Phloem
  - Chloroplasts
  - Upper and lower epidermis
- These structures are all **adaptive features** that allow leaves to photosynthesise efficiently

Dicotyledonous leaf structure diagram

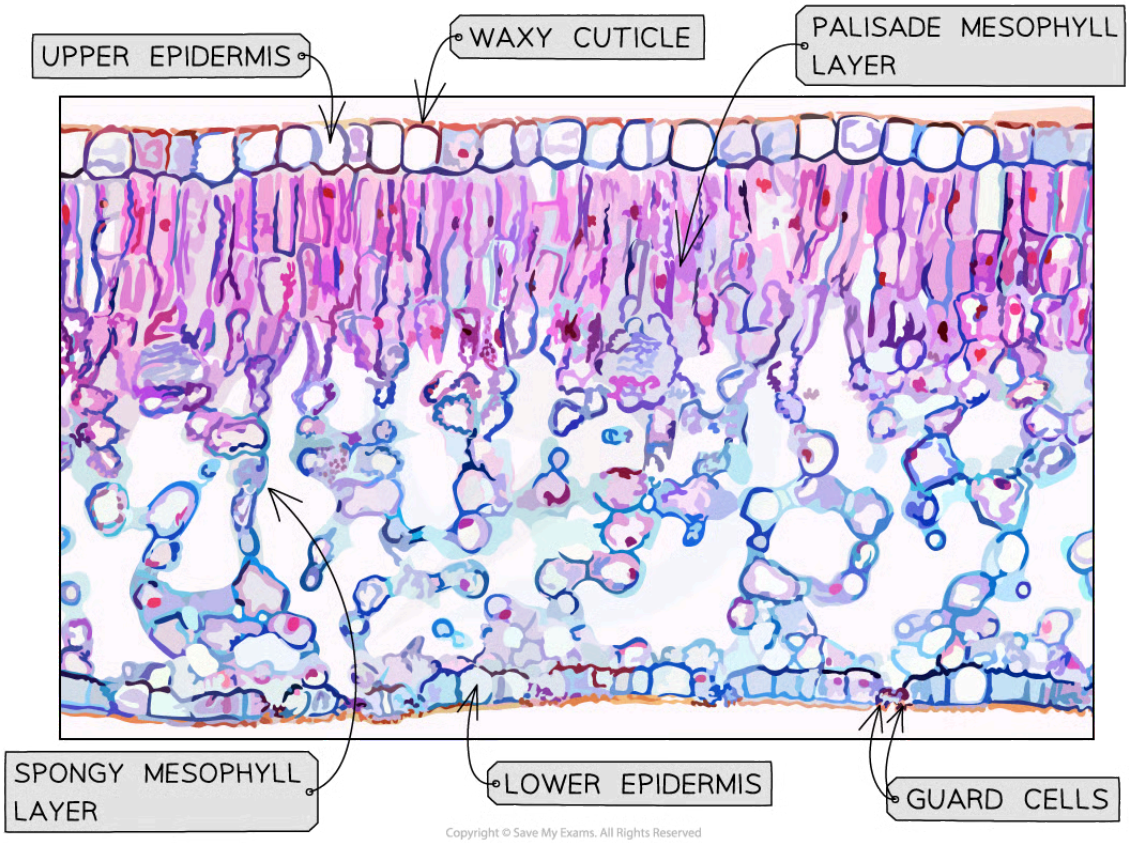
Your notes



Your notes

The structures that make up the leaves of dicotyledonous plants allow them to carry out photosynthesis efficiently

Leaf structure under a microscope diagram



Leaf structures can be seen clearly under a microscope

Leaf structure adaptations table

Structure	Description	Adaptation
Waxy Cuticle	A transparent, fatty layer that covers the upper surface of the leaf	Protects the leaf and reduces water loss by evaporation while allowing light through
Stomata (singular stoma)	Pores through which gases and water vapour can diffuse; most plants have more stomata on their lower leaf surface	Allow carbon dioxide to diffuse into the leaf, and oxygen and water vapour to diffuse out

Guard Cells	Cells that surround the stomata; guard cells can change shape to open or close the stomata	Plants can close the stomata to reduce water loss
Spongy Mesophyll	A layer of photosynthesising cells with air spaces between them	Carry out photosynthesis, and allow the easy movement of gases
Palisade Mesophyll	A layer of column-shaped cells that are tightly packed together; they contain many chloroplasts	Many cells can fit in a single layer beneath the upper surface of leaves, maximising photosynthesis
Vascular Bundle	Contains xylem and phloem	Allows the raw materials of photosynthesis to reach the leaf
Xylem	Transports water around the plant	Provides water for photosynthesis, and maintains the transpiration stream
Phloem	Transports sucrose and amino acids around the plant	Allows the products of photosynthesis to travel away from the leaves to other parts of the plant
Upper Epidermis	A layer of thin cells on the top surface of leaves	Allows light to pass through to the palisade and spongy mesophyll cells
Lower Epidermis	A layer of cells, guard cells and stomata on the underside of leaves	Allows gas exchange to take place

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