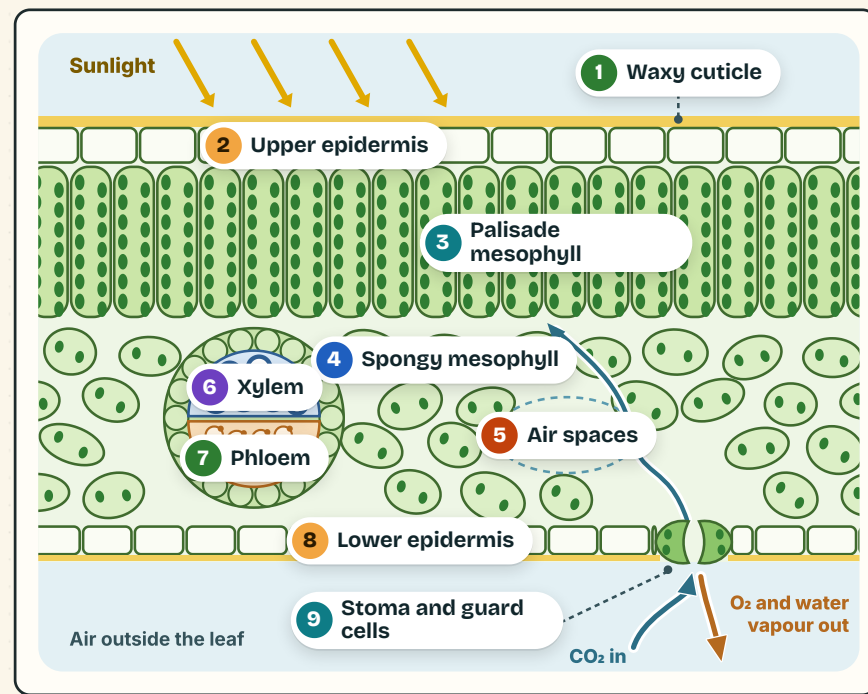


Inside a Leaf

A thin slice through a leaf shows layers of cells, each built to catch light, let gases in or carry water and sugar.



1 Waxy cuticle

A thin, waterproof and see-through layer of wax. It cuts water loss but lets light pass. It is usually thickest on the upper surface.

2 Upper epidermis

One layer of clear cells with no chloroplasts, so light shines straight through to the cells below. It protects the inside of the leaf.

3 Palisade mesophyll

Tall, tightly packed cells just under the surface, crammed with chloroplasts. Most photosynthesis happens here, where the light is brightest.

4 Spongy mesophyll

Rounder, loosely packed cells with fewer chloroplasts. The gaps between them let gases spread through the leaf.

5 Air spaces

Carbon dioxide diffuses through these gaps to every mesophyll cell, while oxygen and water vapour diffuse out towards the stomata.

6 Xylem

Hollow tubes strengthened with lignin that bring water and mineral ions from the roots. In a leaf vein, the xylem lies on the upper side.

7 Phloem

Living cells that carry dissolved sugars from the leaf to the rest of the plant (translocation). In a vein, the phloem lies below the xylem.

8 Lower epidermis

The bottom layer of clear cells, covered by a thinner cuticle. In most plants it holds far more stomata than the upper surface.

9 Stoma and guard cells

A tiny pore between two guard cells. They open it to let carbon dioxide in and oxygen out, and close it to save water.



Thin, flat and full of holes

A leaf's broad, flat shape gives a large surface to catch light. Because it is thin, light reaches the inner cells and gases only travel a short way.

NEXT IN THE SERIES

3. What Limits Photosynthesis? The Limiting Factors