

6.2 Leaf structure

Name: _____ Class: _____ Date: _____

Total: 20 marks

KEY WORDS stomata 气孔 • mesophyll 叶肉 • cuticle 角质层 • palisade mesophyll 栅栏叶肉 • adapted 适应

Objective

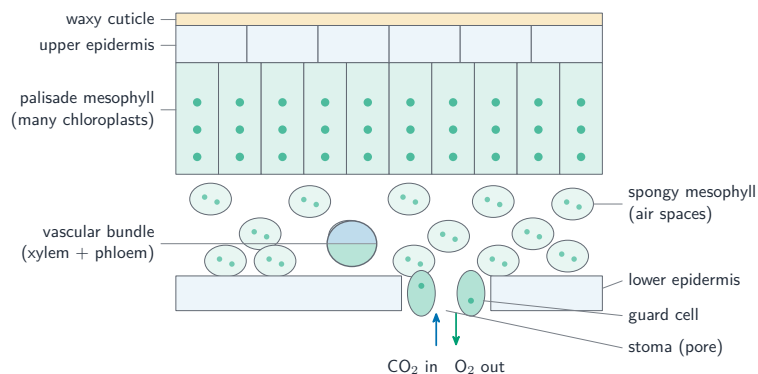
Build the skills to answer exam questions on **leaf structure** 叶的结构 — the tissues of a leaf and how each is **adapted** 适应 for photosynthesis and gas exchange.

You must be able to:

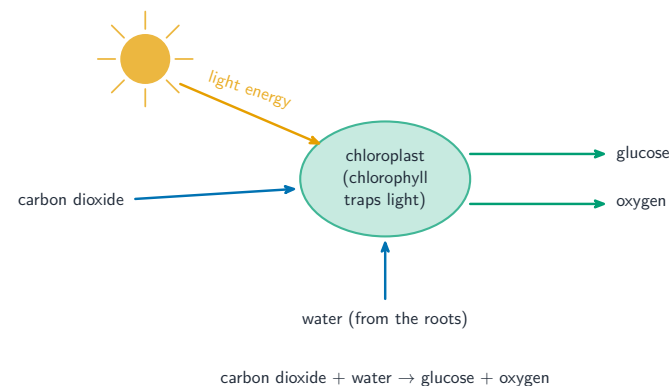
- name the leaf tissues and give the job of each
- explain how leaf features suit photosynthesis
- describe the role of stomata and guard cells

1 Worked examples

■ The leaf in cross-section



Each tissue is adapted for photosynthesis and gas exchange



The leaf is the organ of photosynthesis

- **palisade mesophyll**: packed with chloroplasts, near the top → most photosynthesis.
- **spongy mesophyll**: air spaces → gases move easily.
- **stomata** (lower surface) with **guard cells** → let CO₂ in, O₂ out.

2 Practice

2.1 Name the leaf tissue where most photosynthesis happens. [1]

2.2 State the function of the stomata. [1]

3 Exam-style questions

3.1 Palisade mesophyll cells are well suited to photosynthesis because they: [1]

- | | |
|---|---|
| A | B |
| C | D |
- A have no chloroplasts
 - B are packed with chloroplasts near the top of the leaf
 - C are deep in the leaf
 - D have a thick cuticle

3.2 A leaf is broad and thin.

(a) Explain how being broad helps the leaf.

[1]

(b) Explain how the air spaces in the spongy mesophyll help.

[2]

3.3 State the role of the guard cells.

[2]

3.4 A cross-section through a leaf shows a waxy cuticle, upper epidermis, palisade mesophyll, spongy mesophyll, xylem and phloem, and a lower epidermis containing stomata and guard cells.

(a) For the **palisade mesophyll**, the **spongy mesophyll** and the **stomata**, state one way each is adapted and explain how that adaptation helps the leaf.

[6]

(b) Explain why most stomata are found on the lower surface of the leaf.

[2]

(c) Name the tissue that brings water to the leaf and the tissue that carries sugars away.

[2]

(d) Explain why a leaf is thin and flat.

[2]
