

## 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

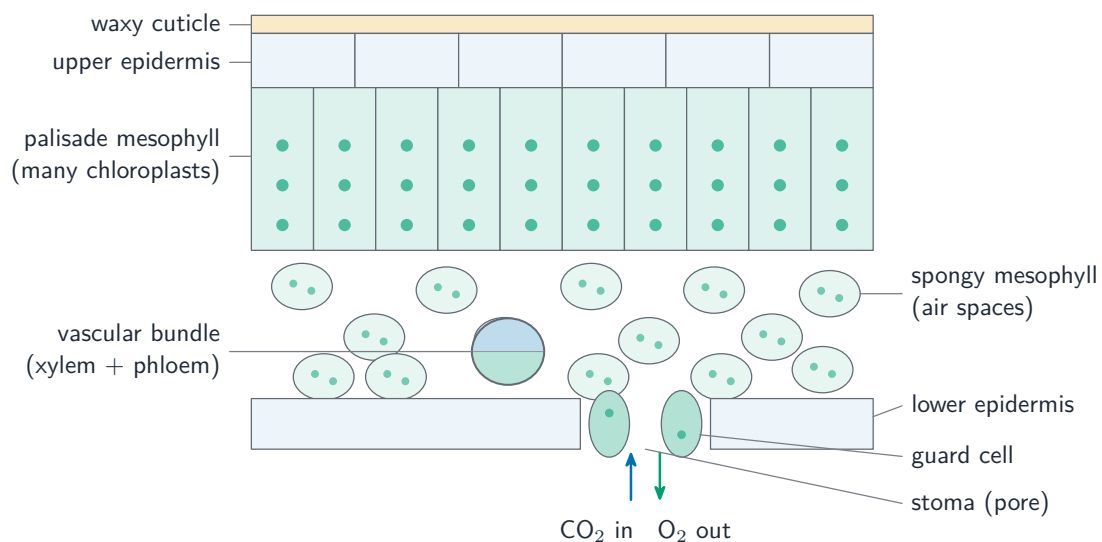
Build the skills to answer exam questions on **leaf structure** 叶的结构 — the tissues of a leaf and how each is **adapted** 适应 for photosynthesis and gas exchange.

**You must be able to:**

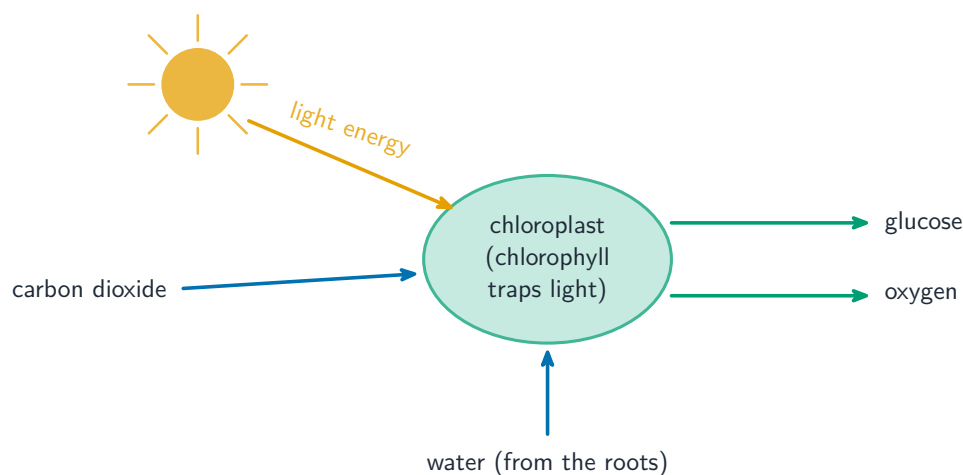
- name the leaf tissues and give the job of each
- explain how leaf features suit photosynthesis
- describe the role of stomata and guard cells

### 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 CO<sub>2</sub> in, O<sub>2</sub> out.

## 2 Practice

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

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2.2 State the function of the stomata. [1]

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## 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]

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(b) Explain how the air spaces in the spongy mesophyll help. [2]

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**3.3** State the role of the guard cells. [2]

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**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]

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(b) Explain why most stomata are found on the lower surface of the leaf. [2]

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(c) Name the tissue that brings water to the leaf and the tissue that carries sugars away. [2]

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(d) Explain why a leaf is thin and flat. [2]

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