

Exercise walk-through

Leaf structure ■ 6.2

eXercise

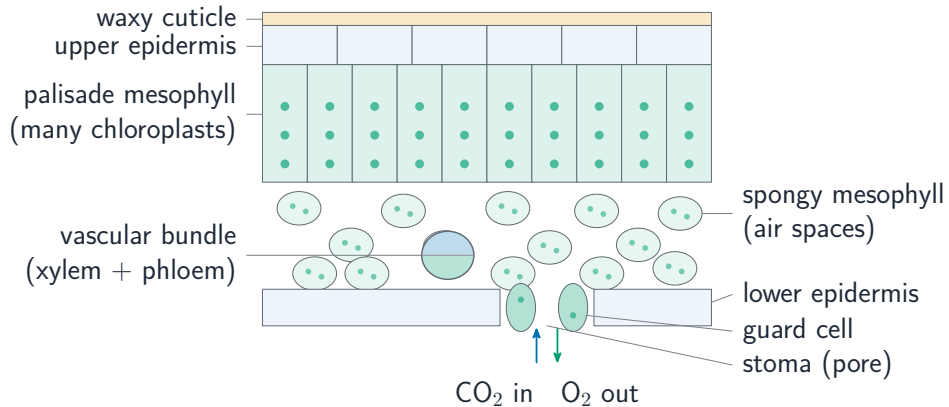
You must be able to

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

Method — The leaf in cross-section

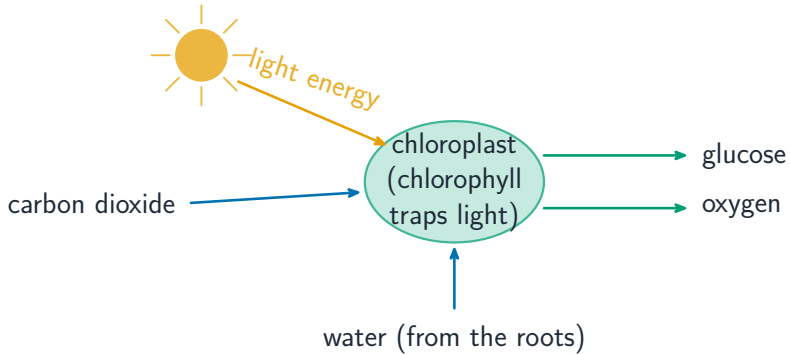
- **palisade mesophyll:** packed with chloroplasts, near the top → most photosynthesis.
- **spongy mesophyll:** air spaces → gases move easily.
- **stomata** (lower surface) with **guard cells** → let CO₂ in, O₂ out.

Method — The leaf in cross-section



A labelled leaf cross-section

Method — The leaf in cross-section



carbon dioxide + water $\rightarrow$ glucose + oxygen

The leaf is the organ of photosynthesis

Practice 2.1 ■ 1 mark

Name the leaf tissue where most photosynthesis happens.

Solution 2.1

Method: The leaf in cross-section

Worked steps

the palisade mesophyll **B1**.

Practice 2.2 ■ 1 mark

State the function of the stomata.

Solution 2.2

Worked steps

they let carbon dioxide in and oxygen out (gas exchange) **B1**.

Exam-style 3.1 ■ 1 mark

Palisade mesophyll cells are well suited to photosynthesis because they:

- 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

Solution 3.1

Method: The leaf in cross-section

- 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

Worked steps

- B.** Palisade cells are packed with chloroplasts near the top.

Exam-style 3.2 ■ 1 mark

A leaf is broad and thin.

- (a) Explain how being broad helps the leaf.
- (b) Explain how the air spaces in the spongy mesophyll help.

Solution 3.2

Method: The leaf in cross-section

Worked steps

(a) a large surface area catches more light **B1**.

(b) the air spaces let gases (CO_2 and O_2) move easily **M1** to and from the cells **A1**.

Exam-style 3.3 ■ 2 marks

State the role of the guard cells.

Solution 3.3

Method: The leaf in cross-section

Worked steps

the guard cells open and close the stomata **M1** to control gas exchange (and water loss) **A1**.