BIOLOGY YEAR 12 - MODULE 8 - LESSON 5

Plant Water Balance and Homeostasis in Other Organisms

Use this worksheet after reading the lesson to practise the key ideas and prove you can meet the success criteria.

Name _____

Date _____

Class _____

1. Key Ideas

A desert plant in 45°C sun loses water through every leaf surface every second — yet many survive for decades. Without kidneys, hormones, or a nervous system, plants have evolved structural and physiological strategies for water balance homeostasis that are every bit as sophisticated as anything in animals.

- How guard cells control stomatal opening and closing via turgor pressure
- Why stomatal opening is a homeostatic trade-off between CO_2 gain and water loss

2. Success Criteria

By the end, you should be able to:

- How guard cells control stomatal opening and closing via turgor pressure
- The role of ABA in triggering stomatal closure during drought
- At least five structural adaptations of xerophytes and the mechanism of each

3. Key Terms

water balance homeostasis that
every bit as sophisticated as anything in animals

What
the physical mechanism you think each one exploits?

Why stomatal opening
a homeostatic trade-off between CO_2 gain and water loss

Stomata
the plant's homeostatic valve

but every minute they
open, water vapour escapes by diffusion

Each stoma
flanked by two guard cells

4. Activity: Build the Lesson Map

Use the lesson to complete the table. Keep answers brief but specific.

Prompt	Your answer
Main concept	
Important example	
Common mistake to avoid	
How this links to the next lesson	

5. Short Answer Questions

1. Explain this lesson goal in your own words: "How guard cells control stomatal opening and closing via turgor pressure". Use one specific example from the lesson.

BAND 3 2 MARKS

2. Apply this idea to a new example: "The role of ABA in triggering stomatal closure during drought". Show your reasoning clearly.

BAND 4 3 MARKS

3. Analyse why this idea matters for understanding Plant Water Balance and Homeostasis in Other Organisms: "At least five structural adaptations of xerophytes and the mechanism of each".

BAND 5 4 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about Plant Water Balance and Homeostasis in Other Organisms but does not use evidence or reasoning.

Improve the answer by writing a stronger response that uses accurate terminology, a relevant example and a clear explanation.

7. Multiple Choice

1. What is the best first step when answering a question about Plant Water Balance and Homeostasis in Other Organisms?

☐ A. Identify the key concept being tested

☐ B. Write every fact from memory

☐ C. Ignore the command word

☐ D. Skip examples and evidence

2. Which answer would show stronger understanding of Plant Water Balance and Homeostasis in Other Organisms?

☐ A. An answer with accurate terms and reasoning

☐ B. A copied definition only

☐ C. A single-word response

☐ D. An answer with no example

3. What should you do if a question asks you to explain?

☐ A. Link the idea to a reason or cause

☐ B. List unrelated facts

☐ C. Only draw a diagram

☐ D. Write the shortest possible answer

8. Success Criteria Proof

Finish with evidence that you can do each success criterion.

SUCCESS CRITERION 1

Prove that you can: How guard cells control stomatal opening and closing via turgor pressure

BAND 3 2 MARKS

SUCCESS CRITERION 2

Prove that you can: The role of ABA in triggering stomatal closure during drought

BAND 4 3 MARKS

SUCCESS CRITERION 3

Prove that you can: At least five structural adaptations of xerophytes and the mechanism of each

BAND 5 4 MARKS

One thing I still need help with: