BIOLOGY YEAR 12 - MODULE 8 - LESSON 4

Water Balance — Neural and Hormonal Coordination (ADH, Aldosterone, Kidney)

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

You lose about 2.5 litres of water every day through breathing, sweating, and urination — yet your blood volume and salt concentration barely change. Two hormones running opposite correction pathways through your kidneys are responsible, and understanding them will also explain why kidney disease is so devastating to homeostasis.

- The stimulus, receptor, hormone, effector and response for the ADH pathway
- Why ADH responds to osmolarity and aldosterone responds to blood pressure

2. Success Criteria

By the end, you should be able to:

- The stimulus, receptor, hormone, effector and response for the ADH pathway
- The stimulus, receptor, hormone, effector and response for the aldosterone pathway
- Where in the nephron each hormone acts (collecting duct vs distal tubule)

3. Key Terms

pathways through your kidneys
responsible, and understanding them will also explain why kidney disease is so devastating to homeostasis

You
still breathing (exhaling water vapour), still sweating slightly, and still producing urine

the organ you think
most involved in adjusting how much water leaves the body

Normal blood osmolarity
~285–295 mOsm/kg

Why the kidneys
the key effector organ for water balance homeostasis

The kidney
the effector organ for water balance homeostasis — just as the liver is the effector for glucose homeostasis

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: "The stimulus, receptor, hormone, effector and response for the ADH pathway". Use one specific example from the lesson.

BAND 3 2 MARKS

2. Apply this idea to a new example: "The stimulus, receptor, hormone, effector and response for the aldosterone pathway". Show your reasoning clearly.

BAND 4 3 MARKS

3. Analyse why this idea matters for understanding Water Balance — Neural and Hormonal Coordination (ADH, Aldosterone, Kidney): "Where in the nephron each hormone acts (collecting duct vs distal tubule)".

BAND 5 4 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about Water Balance — Neural and Hormonal Coordination (ADH, Aldosterone, Kidney) 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 Water Balance — Neural and Hormonal Coordination (ADH, Aldosterone, Kidney)?

☐ 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 Water Balance — Neural and Hormonal Coordination (ADH, Aldosterone, Kidney)?

☐ 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: The stimulus, receptor, hormone, effector and response for the ADH pathway

BAND 3 2 MARKS

SUCCESS CRITERION 2

Prove that you can: The stimulus, receptor, hormone, effector and response for the aldosterone pathway

BAND 4 3 MARKS

SUCCESS CRITERION 3

Prove that you can: Where in the nephron each hormone acts (collecting duct vs distal tubule)

BAND 5 4 MARKS

One thing I still need help with: