BIOLOGY YEAR 12 - MODULE 8 - LESSON 3

Glucose Regulation — Insulin, Glucagon and the Pancreatic Feedback System

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

Every cell in your body runs on glucose. Too much and blood vessels corrode. Too little and neurons die within minutes. The pancreas runs a continuous two-hormone balancing act to keep blood glucose within a 4–6 mmol/L window — and when that system fails, it produces the most common chronic disease in Australia.

- The role of alpha cells (glucagon) and beta cells (insulin) in the islets of Langerhans
- Why the pancreas must run two opposing hormones simultaneously to maintain fine control

2. Success Criteria

By the end, you should be able to:

- The role of alpha cells (glucagon) and beta cells (insulin) in the islets of Langerhans
- The complete pathway for responding to high blood glucose (insulin pathway)
- The complete pathway for responding to low blood glucose (glucagon pathway)

3. Key Terms

muscles
consuming glucose faster than you are eating, where is the replacement glucose coming from? Name the organ you think is

muscle when blood glucose
high and insulin is present

liver when blood glucose
low and glucagon is present

more insulin
required to achieve the same glucose uptake

diabetes
fundamentally different diseases despite similar symptoms

Glucose regulation
slightly different — the pancreatic islet cells function as both receptor and effector in the same organ, detecting bloo

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 role of alpha cells (glucagon) and beta cells (insulin) in the islets of Langerhans". Use one specific example from the lesson.

BAND 3 2 MARKS

2. Apply this idea to a new example: "The complete pathway for responding to high blood glucose (insulin pathway)". Show your reasoning clearly.

BAND 4 3 MARKS

3. Analyse why this idea matters for understanding Glucose Regulation — Insulin, Glucagon and the Pancreatic Feedback System: "The complete pathway for responding to low blood glucose (glucagon pathway)".

BAND 5 4 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about Glucose Regulation — Insulin, Glucagon and the Pancreatic Feedback System 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 Glucose Regulation — Insulin, Glucagon and the Pancreatic Feedback System?

☐ 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 Glucose Regulation — Insulin, Glucagon and the Pancreatic Feedback System?

☐ 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 role of alpha cells (glucagon) and beta cells (insulin) in the islets of Langerhans

BAND 3 2 MARKS

SUCCESS CRITERION 2

Prove that you can: The complete pathway for responding to high blood glucose (insulin pathway)

BAND 4 3 MARKS

SUCCESS CRITERION 3

Prove that you can: The complete pathway for responding to low blood glucose (glucagon pathway)

BAND 5 4 MARKS

One thing I still need help with: