BIOLOGY YEAR 12 - MODULE 6 - LESSON 3

Point Mutation - Base-Level Genetic Change

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 single base change can do almost nothing, change one amino acid, create a premature stop codon or shift every codon after the mutation site. Point mutations are small in scale, but their effects can range from silent to severe.

- Point mutations include substitution, insertion and deletion.
- DNA change affects codons, which may affect amino acid sequence.

2. Success Criteria

By the end, you should be able to:

- Point mutations include substitution, insertion and deletion.
- Substitutions may be silent, missense or nonsense.
- Insertions and deletions can cause frameshift.

3. Key Terms

Point mutation
A mutation affecting one base pair or a very small number of bases in the DNA sequence.

Substitution
One base is replaced by a different base.

Insertion
One or more bases are added into the sequence.

Deletion
One or more bases are removed from the sequence.

Frameshift
A shift in codon reading frame caused by insertion or deletion of bases not in multiples of three.

Silent / missense / nonsense
Terms describing whether a mutation changes no amino acid, a different amino acid, or a stop codon.

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: "Point mutations include substitution, insertion and deletion.". Use one specific example from the lesson.

BAND 3 2 MARKS

2. Apply this idea to a new example: "Substitutions may be silent, missense or nonsense.". Show your reasoning clearly.

BAND 4 3 MARKS

3. Analyse why this idea matters for understanding Point Mutation - Base-Level Genetic Change: "Insertions and deletions can cause frameshift.".

BAND 5 4 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about Point Mutation - Base-Level Genetic Change 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 Point Mutation - Base-Level Genetic Change?

☐ 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 Point Mutation - Base-Level Genetic Change?

☐ 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: Point mutations include substitution, insertion and deletion.

BAND 3 2 MARKS

SUCCESS CRITERION 2

Prove that you can: Substitutions may be silent, missense or nonsense.

BAND 4 3 MARKS

SUCCESS CRITERION 3

Prove that you can: Insertions and deletions can cause frameshift.

BAND 5 4 MARKS

One thing I still need help with: