BIOLOGY YEAR 12 - MODULE 6 - LESSON 6

Fertilisation, Meiosis and Mutation as Causes of Genetic Variation

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

Siblings can be genetically different even when no new mutation occurs, because meiosis reshuffles parental alleles and fertilisation combines gametes randomly. Mutation plays a different role: it introduces genuinely new alleles into the population. This lesson brings those sources of variation together and keeps their jobs separate.

- Mutation, meiosis and fertilisation all contribute to variation.
- These processes have different roles, not interchangeable roles.

2. Success Criteria

By the end, you should be able to:

- Mutation, meiosis and fertilisation all contribute to variation.
- Mutation creates new alleles.
- Meiosis and fertilisation mainly reshuffle existing alleles.

3. Key Terms

Genetic variation
Differences in genetic makeup between individuals in a population.

Mutation
A change in DNA sequence that can create a new allele.

Meiosis
Cell division that produces haploid gametes and reshuffles alleles through independent assortment and crossing over.

Fertilisation
Fusion of two gametes, combining alleles from each parent in a new offspring.

Independent assortment
Random separation of homologous chromosomes during meiosis.

Gene pool
The total collection of alleles in a population.

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: "Mutation, meiosis and fertilisation all contribute to variation.". Use one specific example from the lesson.

BAND 3 2 MARKS

2. Apply this idea to a new example: "Mutation creates new alleles.". Show your reasoning clearly.

BAND 4 3 MARKS

3. Analyse why this idea matters for understanding Fertilisation, Meiosis and Mutation as Causes of Genetic Variation: "Meiosis and fertilisation mainly reshuffle existing alleles.".

BAND 5 4 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about Fertilisation, Meiosis and Mutation as Causes of Genetic Variation 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 Fertilisation, Meiosis and Mutation as Causes of Genetic Variation?

☐ 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 Fertilisation, Meiosis and Mutation as Causes of Genetic Variation?

☐ 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: Mutation, meiosis and fertilisation all contribute to variation.

BAND 3 2 MARKS

SUCCESS CRITERION 2

Prove that you can: Mutation creates new alleles.

BAND 4 3 MARKS

SUCCESS CRITERION 3

Prove that you can: Meiosis and fertilisation mainly reshuffle existing alleles.

BAND 5 4 MARKS

One thing I still need help with: