BIOLOGY YEAR 12 - MODULE 5 - LESSON 12

# Proteins, Phenotype and Gene-Environment Interaction

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

Genes do not produce traits directly. Genes influence protein structure and protein function, and those protein effects contribute to phenotype. Environment can also influence how phenotype is expressed.

- Major functional categories of proteins in living things.
- Why phenotype is not determined by genes alone.

## 2. Success Criteria

By the end, you should be able to:

- Major functional categories of proteins in living things.
- That genotype influences phenotype through protein production and function.
- Why phenotype is not determined by genes alone.

## 3. Key Terms

**Phenotype**
The observable characteristics of an organism.

**Genotype**
The genetic makeup or allele combination of an organism.

**Enzyme**
A protein that speeds up a chemical reaction in living systems.

**Receptor protein**
A protein that binds signalling molecules and helps cells respond.

**Transport protein**
A protein involved in moving substances across membranes or through the body.

**Antibody**
A protein involved in immune defence by recognising specific foreign molecules.

## 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: "Major functional categories of proteins in living things.". Use one specific example from the lesson.**

BAND 3 2 MARKS

**2. Apply this idea to a new example: "That genotype influences phenotype through protein production and function.". Show your reasoning clearly.**

BAND 4 3 MARKS

**3. Analyse why this idea matters for understanding Proteins, Phenotype and Gene-Environment Interaction: "Why phenotype is not determined by genes alone.".**

BAND 5 4 MARKS

## 6. Extend: Apply the Idea

BAND 5/6 5 MARKS

**A student gives a memorised answer about Proteins, Phenotype and Gene-Environment Interaction 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 Proteins, Phenotype and Gene-Environment Interaction?

☐ 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 Proteins, Phenotype and Gene-Environment Interaction?

☐ 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: Major functional categories of proteins in living things.**

BAND 3 2 MARKS

**SUCCESS CRITERION 2**

**Prove that you can: That genotype influences phenotype through protein production and function.**

BAND 4 3 MARKS

**SUCCESS CRITERION 3**

**Prove that you can: Why phenotype is not determined by genes alone.**

BAND 5 4 MARKS

**One thing I still need help with:**