

# Biotechnology - Definitions, Scope and Historical Trajectory

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

Biotechnology is broader than gene editing. Humans have used biological systems for food production, fermentation and selective breeding for a long time. Modern biotechnology extends that history with technologies such as recombinant DNA, cloning and precision genetic manipulation. This lesson defines the field before later lessons judge its ethical and biodiversity effects.

- Biotechnology includes traditional and modern practices.
- Biotechnology is broader than recombinant DNA alone.

## 2. Success Criteria

By the end, you should be able to:

- Biotechnology includes traditional and modern practices.
- It is used in agriculture, medicine and industry.
- Modern biotechnology is an extension of older biological problem-solving.

## 3. Key Terms

### Biotechnology

Use of living organisms, cells or biological processes to make products or solve problems in agriculture, medicine and industry.

### Traditional biotechnology

Longstanding use of biological systems such as fermentation, domestication and selective breeding.

### Modern biotechnology

Contemporary technologies involving genetic analysis or manipulation, such as recombinant DNA, cloning and gene editing.

### Fermentation

Use of microorganisms to produce products such as bread, yoghurt, cheese and alcohol.

### Recombinant DNA

DNA formed by combining genetic material from different sources.

### Precision breeding

Targeted use of genetic knowledge or technology to influence inheritance outcomes more directly than traditional selection alone.

## 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: "Biotechnology includes traditional and modern practices.". Use one specific example from the lesson.

**BAND 3** **2 MARKS**

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2. Apply this idea to a new example: "It is used in agriculture, medicine and industry.". Show your reasoning clearly.

**BAND 4** **3 MARKS**

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3. Analyse why this idea matters for understanding Biotechnology - Definitions, Scope and Historical Trajectory: "Modern biotechnology is an extension of older biological problem-solving.".

**BAND 5** **4 MARKS**

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## 6. Extend: Apply the Idea

BAND 5/6

5 MARKS

**A student gives a memorised answer about Biotechnology - Definitions, Scope and Historical Trajectory 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.

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## 7. Multiple Choice

1. What is the best first step when answering a question about Biotechnology - Definitions, Scope and Historical Trajectory?

- 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 Biotechnology - Definitions, Scope and Historical Trajectory?

- 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: Biotechnology includes traditional and modern practices.**

**BAND 3**

**2 MARKS**

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### SUCCESS CRITERION 2

**Prove that you can: It is used in agriculture, medicine and industry.**

**BAND 4**

**3 MARKS**

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### SUCCESS CRITERION 3

**Prove that you can: Modern biotechnology is an extension of older biological problem-solving.**

**BAND 5**

**4 MARKS**

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

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