BIOLOGY YEAR 12 - MODULE 5 - LESSON 6

DNA Structure and DNA Replication

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 new cell needs a copy of hereditary information. That is only possible because DNA has a structure that can be copied precisely: a double helix built from paired nucleotides. Replication is powerful because each old strand can guide formation of a new one.

- The nucleotide components of DNA.
- Why complementary pairing allows accurate DNA copying.

2. Success Criteria

By the end, you should be able to:

- The nucleotide components of DNA.
- The Watson and Crick model of DNA as a double helix with complementary base pairing.
- That replication is semiconservative.

3. Key Terms

Nucleotide
The building block of DNA, consisting of a sugar, phosphate group and nitrogenous base.

Double helix
The twisted ladder structure formed by two DNA strands.

Complementary base pairing
Specific pairing of bases: adenine with thymine, and cytosine with guanine.

Hydrogen bonds
Weak bonds between complementary bases that help hold the two DNA strands together.

Semiconservative replication
DNA replication in which each new DNA molecule contains one original strand and one newly synthesised strand.

Template strand
An original DNA strand used to guide formation of a new complementary strand.

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 nucleotide components of DNA.". Use one specific example from the lesson.

BAND 3 2 MARKS

2. Apply this idea to a new example: "The Watson and Crick model of DNA as a double helix with complementary base pairing.". Show your reasoning clearly.

BAND 4 3 MARKS

3. Analyse why this idea matters for understanding DNA Structure and DNA Replication: "That replication is semiconservative.".

BAND 5 4 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about DNA Structure and DNA Replication 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 DNA Structure and DNA Replication?

☐ 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 DNA Structure and DNA Replication?

☐ 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 nucleotide components of DNA.

BAND 3 2 MARKS

SUCCESS CRITERION 2

Prove that you can: The Watson and Crick model of DNA as a double helix with complementary base pairing.

BAND 4 3 MARKS

SUCCESS CRITERION 3

Prove that you can: That replication is semiconservative.

BAND 5 4 MARKS

One thing I still need help with: