CHEMISTRY YEAR 12 - MODULE 8 - LESSON 13

Optical Isomerism & Chirality in Medicines

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

The thalidomide tragedy showed that two molecules with the same atoms and bonds can still behave very differently in the body. In medicinal chemistry, three-dimensional arrangement matters, because biological systems are themselves chiral and can distinguish one enantiomer from its mirror image.

- The definition of a chiral centre and an enantiomer
- How enantiomers differ from structural and geometric isomers

2. Success Criteria

By the end, you should be able to:

- The definition of a chiral centre and an enantiomer
- The meaning of a racemic mixture
- The role of polarimetry in detecting optical activity

3. Key Terms

S-enantiomer
associated with

because biological systems
themselves chiral and can distinguish one enantiomer from its mirror image

What
chemically wrong with that statement?

chiral centre
a carbon bonded to four different groups

molecule
chiral if it cannot be superimposed on its mirror image

These
mirror images of each other, but they are not identical

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 definition of a chiral centre and an enantiomer". Use one specific example from the lesson.

BAND 3 2 MARKS

2. Apply this idea to a new example: "The meaning of a racemic mixture". Show your reasoning clearly.

BAND 4 3 MARKS

3. Analyse why this idea matters for understanding Optical Isomerism & Chirality in Medicines: "The role of polarimetry in detecting optical activity".

BAND 5 4 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about Optical Isomerism & Chirality in Medicines 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 Optical Isomerism & Chirality in Medicines?

☐ 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 Optical Isomerism & Chirality in Medicines?

☐ 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 definition of a chiral centre and an enantiomer

BAND 3 2 MARKS

SUCCESS CRITERION 2

Prove that you can: The meaning of a racemic mixture

BAND 4 3 MARKS

SUCCESS CRITERION 3

Prove that you can: The role of polarimetry in detecting optical activity

BAND 5 4 MARKS

One thing I still need help with: