CHEMISTRY YEAR 12 - MODULE 7 - LESSON 2

IUPAC Nomenclature II — Functional Group Classes & Isomers

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 difference between an antiseptic, a food preservative, a banana flavouring, and a painkiller might be just one functional group on the same carbon skeleton — and the naming system you build today lets you tell them apart at a glance.

- The structural signature, suffix/prefix, and a named example for each of the eight functional group classes
- Why the position of a carbonyl group (terminal vs internal) determines whether a compound is an aldehyde, ketone, or carboxylic acid

2. Success Criteria

By the end, you should be able to:

- The structural signature, suffix/prefix, and a named example for each of the eight functional group classes
- The IUPAC suffixes: -ol, -al, -one, -oic acid, -amide, -amine, and the “alkyl alkanoate” pattern for esters
- That primary/secondary/tertiary classification applies to alcohols (on C–OH) and amines (on N)

3. Key Terms

-one
The ability of an atom to attract bonding electrons in a covalent bond.

-oic acid
A substance that donates protons (H^+) or accepts electron pairs, according to context.

-amine
Amines have an undelocalised lone pair that freely accepts H^+.

-amide
Delocalised by resonance into the adjacent C=O — it is spread across the C–N bond and unavailable to accept.

Hydrocarbon
An organic compound containing only carbon and hydrogen atoms.

Functional group
A specific atom arrangement determining characteristic chemical reactions.

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. 1. Butane ($CH_3CH_2CH_2CH_3$) vs 2-methylpropane ($CH_3CH(CH_3)CH_3$)

BAND 3 3 MARKS

2. 2. Butan-1-ol ($CH_3CH_2CH_2CH_2OH$) vs Butan-2-ol ($CH_3CH_2CHOHCH_3$)

BAND 4 3 MARKS

3. 3. Butanal ($CH_3CH_2CH_2CHO$) vs Butan-2-one ($CH_3COCH_2CH_3$)

BAND 5 3 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about ⚗️ IUPAC Nomenclature II — Functional Group Classes & Isomers 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 🤿 IUPAC Nomenclature II — Functional Group Classes & Isomers?

☐ 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 🤿 IUPAC Nomenclature II — Functional Group Classes & Isomers?

☐ 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 structural signature, suffix/prefix, and a named example for each of the eight functional group classes

BAND 3 2 MARKS

SUCCESS CRITERION 2

Prove that you can: The IUPAC suffixes: -ol, -al, -one, -oic acid, -amide, -amine, and the “alkyl alkanoate” pattern for esters

BAND 4 3 MARKS

SUCCESS CRITERION 3

Prove that you can: That primary/secondary/tertiary classification applies to alcohols (on C–OH) and amines (on N)

BAND 5 4 MARKS

One thing I still need help with: