CHEMISTRY YEAR 11 - MODULE 1 - LESSON 16

Electron Configuration: Subshell Notation

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

MRI machines use superconducting magnets that only work near absolute zero. The technology relies on understanding how electrons fill energy levels in certain transition metals. Fireworks glow because electrons in metal salts jump to excited states then crash back down, releasing photons of specific colours — copper gives blue, strontium gives red, barium gives green. Every colour of light from every atom in the universe traces back to electron configuration. This lesson gives you the full quantum mechanical picture of how electrons are arranged in atoms — the foundation of everything from the periodic table trends to chemical bonding.

- The four quantum numbers (n, l, m_l, m_s) and what they describe
- Why subshells fill in a specific order (energy order)

2. Success Criteria

By the end, you should be able to:

- The four quantum numbers (n, l, m_l, m_s) and what they describe
- Subshell types: s (2e), p (6e), d (10e), f (14e)
- The Aufbau principle, Pauli exclusion principle, and Hund's rule

3. Key Terms

Key idea
The central concept from Electron Configuration: Subshell Notation.

Evidence
Information, observations or calculations used to support an answer.

Explain
Give a reasoned answer that links cause and effect.

Apply
Use a learned idea in a new example, problem or scenario.

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. 6. Write the full electron configuration for each element and identify: the number of valence electrons, and the group and period the element belongs to. (a) Silicon (Z=14), (b) Manganese (Z=25).

BAND 3 4 MARKS

2. 7. Explain why chromium (Z=24) has the configuration $[Ar]3d^5 4s^1$ rather than the expected $[Ar]3d^4 4s^2$. In your answer, refer to orbital stability and electron repulsion.

BAND 4 3 MARKS

6. Extend: Apply the Idea

BAND 5/6 | 5 MARKS

A student gives a memorised answer about Electron Configuration: Subshell Notation 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 Electron Configuration: Subshell Notation?

☐ 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 Electron Configuration: Subshell Notation?

☐ 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 four quantum numbers (n, l, m_l, m_s) and what they describe

BAND 3 | 2 MARKS

SUCCESS CRITERION 2

Prove that you can: Subshell types: s (2e), p (6e), d (10e), f (14e)

BAND 4 | 3 MARKS

SUCCESS CRITERION 3

Prove that you can: The Aufbau principle, Pauli exclusion principle, and Hund's rule

BAND 5 | 4 MARKS

One thing I still need help with: