

Atomic Structure and Models of the Atom

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

In 1897, J.J. Thomson discovered the electron and shattered the 2,400-year-old idea of an indivisible atom. By 1911, Rutherford's gold foil experiment revealed a tiny, dense, positive nucleus surrounded mostly by empty space. By 1913, Bohr had quantised electron energies into fixed orbits. Each model was revolutionary — and each was later proved incomplete. Science advances not by being right, but by making better models as new evidence arrives. This is IQ3: how do scientists develop understanding of atomic structure from experimental evidence?

- The key features of Thomson, Rutherford, and Bohr models
- Why each model was an improvement on the previous one

2. Success Criteria

By the end, you should be able to:

- The key features of Thomson, Rutherford, and Bohr models
- The experimental evidence that led to each model
- Subatomic particles: proton, neutron, electron (mass, charge, location)

3. Key Terms

Key idea

The central concept from Atomic Structure and Models of the Atom.

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. Describe Rutherford's gold foil experiment, including the experimental design, observations, and the conclusions drawn about atomic structure.

BAND 3

5 MARKS

2. 7. Explain how the development of atomic models illustrates the nature of science — specifically the idea that models are revised when new evidence emerges. Use at least two specific historical examples.

BAND 4

4 MARKS

6. Extend: Apply the Idea

BAND 5/6

5 MARKS

A student gives a memorised answer about Atomic Structure and Models of the Atom 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 Atomic Structure and Models of the Atom?

- 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 Atomic Structure and Models of the Atom?

- 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 key features of Thomson, Rutherford, and Bohr models

BAND 3 **2 MARKS**

SUCCESS CRITERION 2

Prove that you can: The experimental evidence that led to each model

BAND 4 **3 MARKS**

SUCCESS CRITERION 3

Prove that you can: Subatomic particles: proton, neutron, electron (mass, charge, location)

BAND 5 **4 MARKS**

One thing I still need help with:
