

**Insert School Logo**

**Extended Response Task 1 2024**

**Discovering the Structure of the Atom - Validation**

**Total Marks: /26**

**Weighting 5%**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Teacher: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***TIME ALLOWED FOR THIS PAPER***

Working time for the paper: Thirty five minutes

***MATERIALS REQUIRED/RECOMMENDED FOR THIS PAPER***

**To be provided by the supervisor:**

This Question/Answer Booklet

Chemistry Data Book

**To be provided by the candidate:**

Standard items: pens, pencils, eraser or correction fluid, ruler, highlighter.

Special items: calculators satisfying the conditions set by the SCSA for this subject.

***IMPORTANT NOTE TO CANDIDATES***

No other items may be taken into the examination room. It is **your** responsibility to ensure that you do not have any unauthorised notes or other items of a non-personal nature in the examination room. If you have any unauthorised material with you, hand it to the supervisor **before** reading any further.

1. Describe the contributions of John Dalton and any experiments he did. (2 marks)

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1. What was the problem with the experiments that Dalton conducted? (1 mark)

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1. J. J. Thompson was famous for describing the “plum pudding” model of the atom. In the space below, draw a labelled diagram of the plum pudding model of the atom.

(3 marks)

1. What piece of equipment did Thompson use to discover the existence of charged particles in the atom? How did this component verify the existence of sub-atomic particles?

(2 marks)

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1. Ernest Rutherford is famously credited with discovering the existence of the nucleus being surrounded by electrons by using the gold foil experiment.
2. Draw the gold foil experimental setup below, making sure to label the gold foil, detection sheets, and radiation source. (3 marks)

1. What type of radiation was used, and what was its charge? (2 marks)

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1. Discuss what would happen if the plum pudding model had been accurate, explaining why. (2 marks)

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1. What is the major difference between the Rutherford and Bohr models of the atom? Which element did Bohr base his calculations on? (2 marks)

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1. Name the observable phenomena Bohr used to explain why there must be discrete and distinct energy levels that electrons must exist in, and why this phenomena explains that the energy levels that electrons exist in are discrete and distinct. (3 marks)

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1. What was James Chadwick’s contribution to atomic theory? Why was this important to atomic theory? (2 marks)

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1. Draw and label a carbon -14 atom showing all the sub-atomic particles and their location.

(4 marks)

**End of Validation**