HIGH SCHOOL CHEMISTRY

CHAPTER 2

Set 1: Atomic Theory

Free Sample

Sample pages adapted from the full Atomic Theory study set. Try them, then get the whole set.

Try it, then get the whole set

7	5	12	★
files in the full set	sample sections	original diagrams	Honors kept separate

- Sample pages from the notes, revision sheets, traps, practice, flashcards and lab skills
- Answers included for every sample question
- Honors material clearly marked so Regular students can skip it

For high school chemistry, Regular and Honors. Chapter 2: Atoms and Isotopes.

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FREE SAMPLE · SET 1 OF 3

Try the Atomic Theory set before you buy

This free sampler shows you sample pages adapted from six of the seven files in the full **Atomic Theory** study set: the notes, the revision sheets, the exam traps, the practice questions, the flashcards and the lab skills. If you like how these pages teach, the full set gives you the whole topic, start to finish.

7	12	★	✓
files in the full set	original diagrams	Honors kept separate	answers for everything

What's in the full Atomic Theory set

File	What it does for you
1 · Complete Study Notes	Five lessons, one experiment at a time, with worked examples and quick checks.
2 · Quick Revision Sheets	Tables, diagrams, memory tricks and a one-page cheat sheet.
3 · Exam Traps and Common Mistakes	The mistakes that cost students points, and how to dodge each one.
4 · Practice Question Bank	Questions by lesson, easy to hard, with full worked answers.
5 · Quizzes and Unit Test	Timed quizzes and a unit test with an explained answer key.
6 · Glossary and Flashcards	Every key term and scientist, plus cut-out flashcards.
7 · Lab Skills for Tests	Indirect evidence, reading data and sources of error, with test-style questions.

NOTE | Regular or Honors?

Honors material sits in blue boxes marked ★ HONORS . Regular students can skip every one of them and still master the topic.

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SAMPLE 1 From the Complete Study Notes

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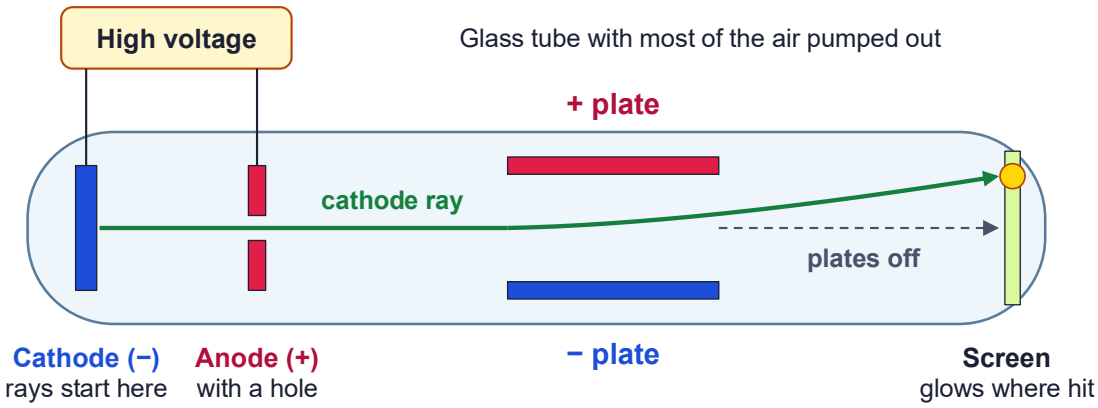
This page is adapted from **Complete Study Notes**, one of the seven files in the full Atomic Theory set.

Thomson's cathode-ray tube



The beam bends TOWARD the + plate, so the particles are negative.

Observation	Conclusion
The beam bends **toward the positive plate** and away from the negative plate. A magnet also bends it.	The particles are **negatively charged**.

EXAM TRAP | Which way does the beam bend?

Opposite charges attract. The beam is **negative**, so it bends **toward the positive (+) plate**. Students often draw it bending toward the negative plate. If a test shows a + plate on top, the beam curves up.

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SAMPLE 2 From the Quick Revision Sheets

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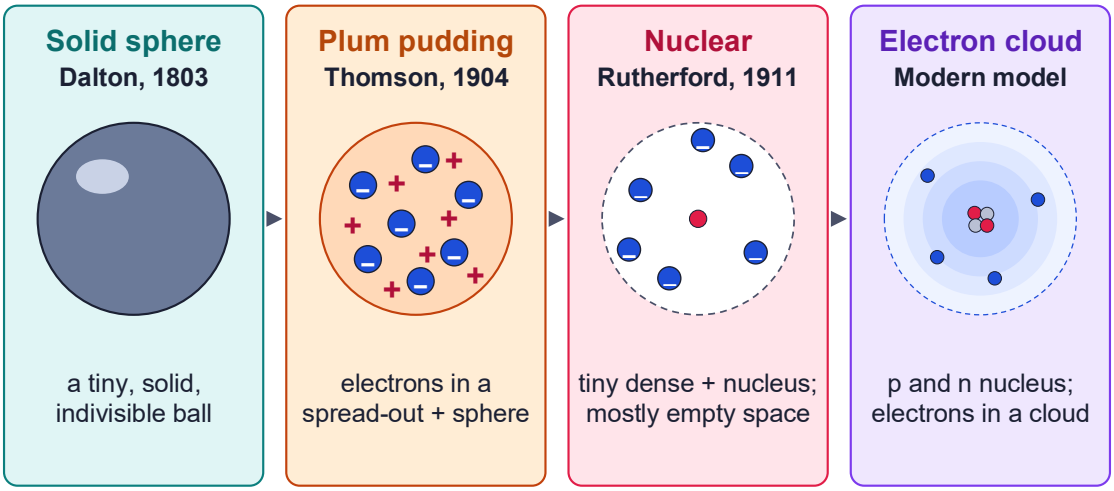
This page is adapted from **Quick Revision Sheets**, one of the seven files in the full Atomic Theory set.



Model	Scientist	Evidence	Big idea
Solid sphere	Dalton, 1803	mass laws	tiny indivisible balls
Plum pudding	Thomson, 1904	cathode-ray tube	electrons in a + sphere
Nuclear	Rutherford, 1911	gold foil	tiny dense + nucleus
Electron cloud	today	neutron (1932) and later work	p + n nucleus; electron cloud

MEMORY TRICK | Which model came when?

Some **P**eople **N**ever **E**at: **S**olid sphere, **P**lum pudding, **N**uclear, **E**lectron cloud.

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SAMPLE 3 From Exam Traps and Common Mistakes

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This page is adapted from **Exam Traps and Common Mistakes**, one of the seven files in the full Atomic Theory set.

EXAM TRAP 14 | Atoms are empty

✗ WHAT STUDENTS WRITE	✓ WHAT EARNS THE POINTS
"Most alpha particles went straight through the foil, so atoms are empty."	Atoms are **mostly empty space**, not empty. The tiny nucleus and the electrons are still there; they just take up very little of the atom's volume.

Why it's wrong: "Empty" says there is nothing there at all. The word "mostly" is what earns the point.

MEMORY TRICK **"Mostly" earns the point.**

EXAM TRAP 20 | Mixing up the charges

✗ WHAT STUDENTS WRITE	✓ WHAT EARNS THE POINTS
"Protons are positive, electrons have no charge and neutrons are negative."	Proton **+1**, neutron **0** (neutral), electron **−1**.

Why it's wrong: The names help: a **neutron** is **neutral**. The electron is the negative particle Thomson found.

MEMORY TRICK **Proton = Positive. Neutron = Neutral. Electron = the negative one.**

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SAMPLE 4 From the Practice Question Bank

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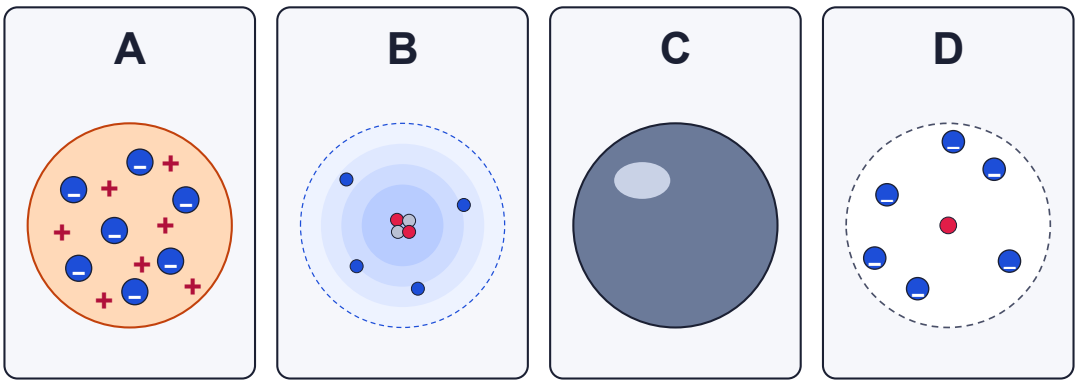
This page is adapted from **Practice Question Bank**, one of the seven files in the full Atomic Theory set.

Q60 The diagram shows four models of the atom, labeled A to D. Name each model and the scientist linked with it.



Model	Name of model	Scientist
A		
B		
C		
D		

ANSWER KEY | Answers

Q60 **A: plum pudding, Thomson. B: modern (electron cloud), many 20th-century scientists. C: solid sphere, Dalton. D: nuclear, Rutherford.**

Look for clues: a plain ball (Dalton), dots scattered through a ball (Thomson), a dot in the middle of empty space (Rutherford), a fuzzy cloud around a nucleus (modern).

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SAMPLE 5 Flashcards and Lab Skills

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This page is adapted from **Glossary and Flashcards**, one of the seven files in the full Atomic Theory set.

Front	Back
Nucleus	The tiny, dense, positively charged center of an atom. It holds the protons and neutrons and over 99.9% of the mass.
Plum pudding model	Thomson's 1904 model: a sphere of spread-out positive charge with electrons scattered through it. It has no nucleus.
Cathode ray	A beam of electrons that travels from the cathode to the anode in a cathode-ray tube.
Electron cloud	The region around the nucleus where electrons move. It is not a solid shell; it shows where electrons are likely to be.

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This page is adapted from **Lab Skills for Tests**, one of the seven files in the full Atomic Theory set.

Observation vs. inference

- **Observation:** what you detect with your senses or an instrument. “Roll 2 came straight back.” “The crucible and copper had a mass of 29.81 g.”
- **Inference:** a conclusion you draw from observations. “The hidden shape has a flat side facing the front.” “Atoms have a tiny, dense nucleus.”
- **Indirect evidence:** nobody has ever looked at a nucleus. Rutherford **inferred** it from how alpha particles scattered, just as you infer a hidden shape from how marbles roll. Tests love this word: the nucleus was found by **indirect evidence**.

Data set: alpha particles and gold foil

Q8 Sample data in the style of the gold-foil experiment are shown below for 10,000 alpha particles. (a) What percent were bent less than 10°? (b) Which row is the evidence for a tiny, dense nucleus? (c) What would the plum pudding model predict for the last two rows?

Path of the alpha particle	Number counted
Bent less than 10°	9,962
Bent 10° to 90°	36
Bent more than 90° (came back)	2

ANSWER KEY | What the data show

Q8 (a) 99.62%: $\frac{9962}{10\,000} \times 100 = 99.62\%$ (b) The last row: about 1 in 5,000 came back, so a very small, very dense, positive region turned them around. (c) Zero, or almost zero, in both rows: the spread-out positive charge was too weak to bend them much.

The full file has three data sets like this one, including a mystery-box lab, plus test-style lab questions and sources of error, all with answers.

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Get the Full Atomic Theory Set

You've seen a few pages. The full set covers **all of Atomic Theory**, start to finish.

- ✓ **Complete Study Notes:** five lessons, worked examples and quick checks.
- ✓ **Quick Revision Sheets:** tables, diagrams, memory tricks and a one-page cheat sheet.
- ✓ **Exam Traps and Common Mistakes:** the mistakes that cost points, fixed.
- ✓ **Practice Question Bank:** questions by lesson with full worked answers.
- ✓ **Quizzes and Unit Test:** check you're ready, with an answer key.
- ✓ **Glossary and Flashcards:** every key term, ready to cut out.
- ✓ **Lab Skills for Tests:** indirect evidence, data sets and sources of error, with test-style questions and answers.

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Also in Chapter 2: Set 2, Atomic Structure, and Set 3, Isotopes and Atomic Mass. Each set works on its own.

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