AQA GCSE Chemistry

Atomic structure and the periodic table · Foundation tier

Questions only

The newest questions on the Foundation papers, about an hour. All 15 are in the exam generator.

Questions	Total marks	Time allowed
6	**54**	**57 min**

Name _____ Class or teacher _____ Date _____

Instructions

- Answer all questions in the spaces provided.
- Use black ink. Show your working for every calculation.
- You may use a scientific calculator and the periodic table insert.
- Print the separate mark scheme when you are ready to mark your answers.

For marking

Q	Source	Marks	Score
1	2024 P1F Q1	9	
2	2024 P1F Q10 / P1H Q3	8	
3	2024 P1F Q9 / P1H Q2	11	
4	2025 P1F Q1	7	
5	2025 P1F Q7	10	
6	2025 P1F Q8 / P1H Q1	9	

Total _____ / 54 **Percentage** _____ %

Questions from AQA GCSE past papers, 2024–2025, reproduced for revision. Practise these topics online, with instant marking: `whiteboardchemistry.com/revision/gcse-chemistry/exam-questions?topics=c1-atomic-structure&demand=low,standard&len=0`

Questions

Atomic structure and the periodic table · Foundation tier · 6 questions · 54 marks · time allowed 57 min

Q1 · June 2024 · Paper 1 Foundation · Q1 · [9 marks]

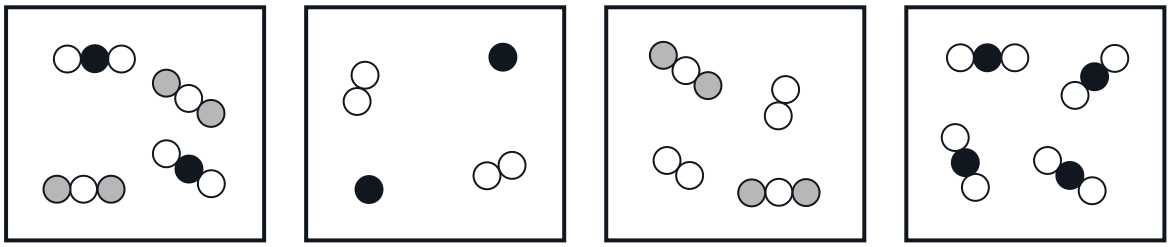
This question also needs Bonding, structure, and the properties of matter.

This question is about elements, compounds and mixtures.

Figure 1 shows diagrams which represent the atoms and molecules in different substances.

Figure 1

● ● and ○ represent different types of atom.



01.1 Which diagram in Figure 1 represents a pure compound?

Tick (✓) **one** box.

A	☐
B	☐
C	☐
D	☐

[1 mark]

01.2 Which diagram in Figure 1 represents a mixture of an element and a compound?

Tick (✓) **one** box.

A	☐
B	☐
C	☐
D	☐

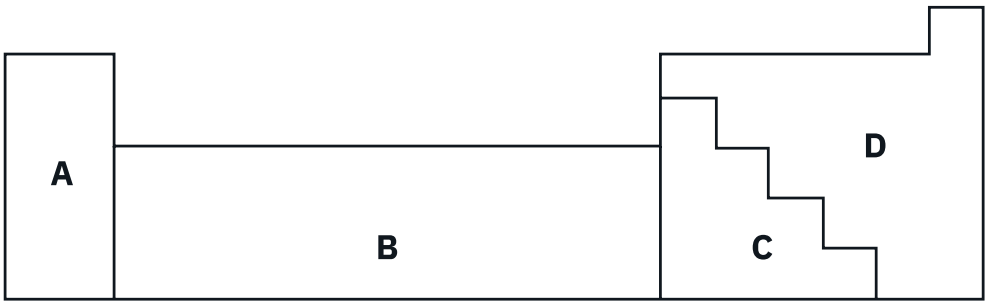
[1 mark]

01.3 Elements are metals or non-metals.

Figure 2 shows an outline of the periodic table.

The periodic table is divided into sections.

Figure 2



Where are metals found in the periodic table?

Tick (✓) **one** box.

Section A only	☐
Sections A, B and C	☐
Sections B, C and D	☐
Section D only	☐

[1 mark]

01.4 Which **two** of the following are typical properties of a transition metal?

Tick (✓) **two** boxes.

Can be bent and shaped	☐
Good conductor of electricity	☐
Low density	☐
Low melting point	☐
Poor conductor of heat	☐

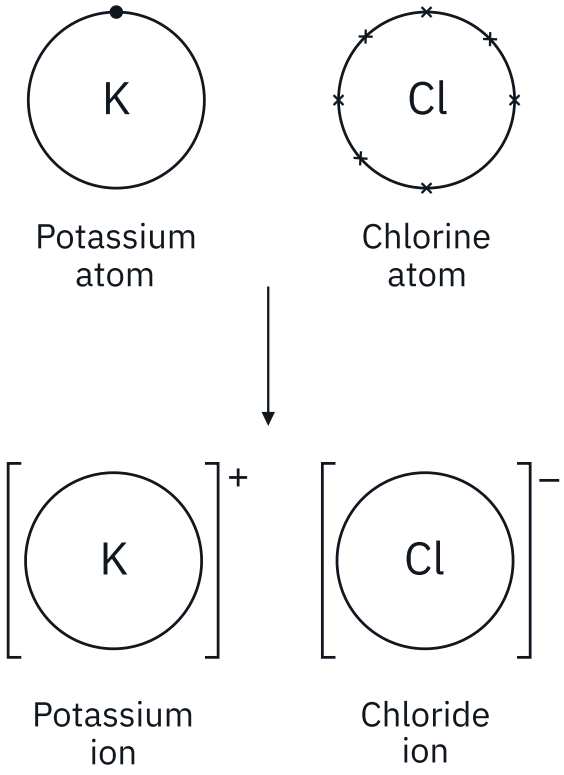
[2 marks]

01.5 Potassium and chlorine react to produce potassium chloride.

An atom of potassium loses an electron to form a potassium ion.

An atom of chlorine gains an electron to form a chloride ion.

Complete the dot and cross diagram.



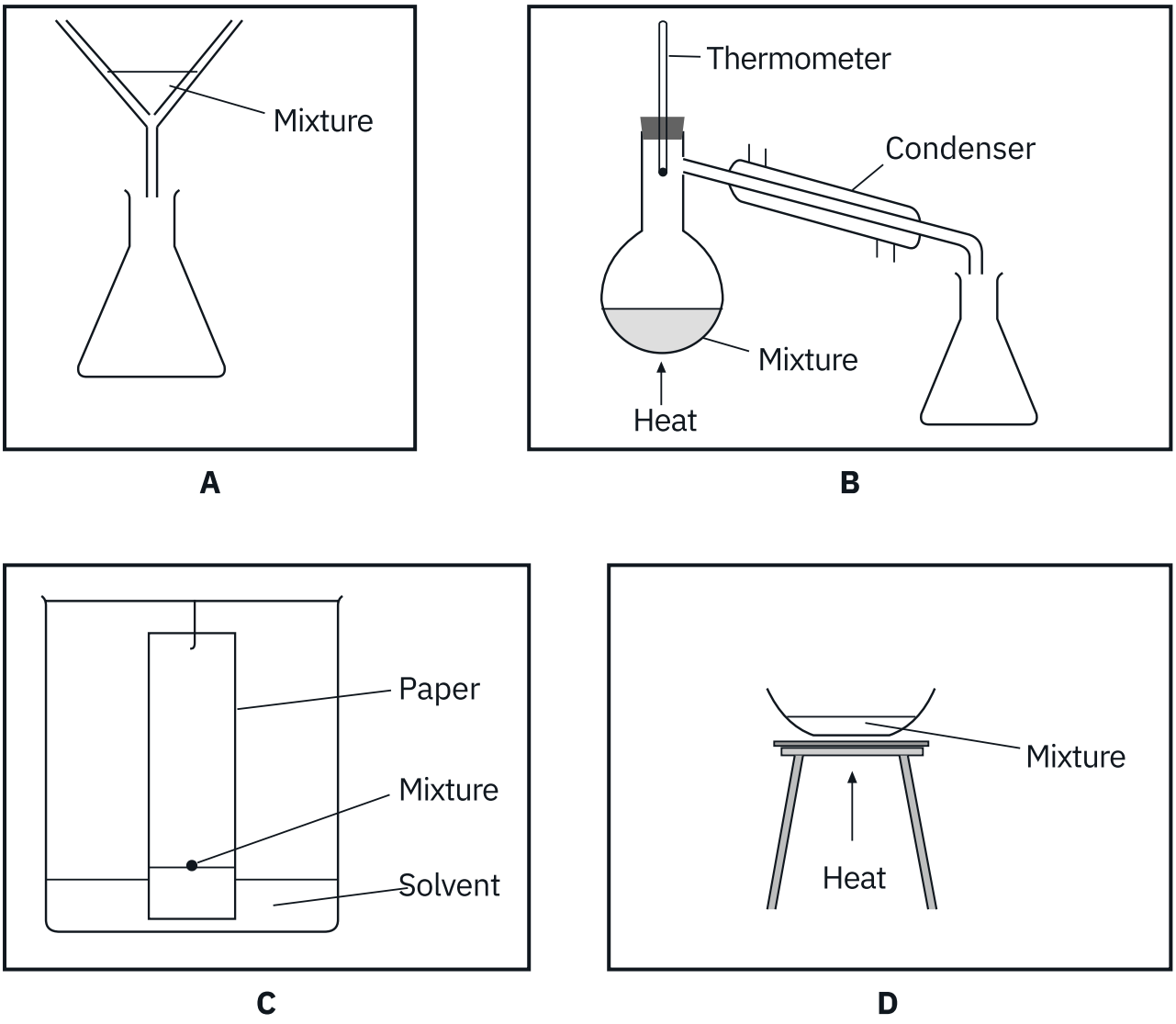
[2 marks]

Draw your answer on the figure above.

01.6 Mixtures are separated by different methods.

Figure 3 shows the apparatus for separating four different types of mixture.

Figure 3



Which apparatus could be used to collect water from sodium chloride solution?

Use Figure 3.

Tick (✓) **one** box.

A	☐
B	☐
C	☐
D	☐

[1 mark]

01.7 Which apparatus shows filtration?

Use Figure 3.

Tick (✓) **one** box.

A	☐
B	☐
C	☐
D	☐

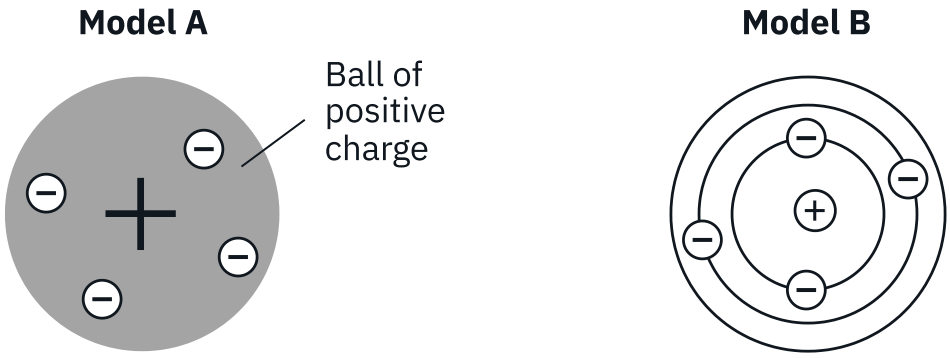
[1 mark]

Q2 · June 2024 · Paper 1 Foundation · Q10 · Paper 1 Higher · Q3 · [8 marks]

This question is about models of the atom.

Figure 16 shows two early models of the atom.

Figure 16



10.1 Name the models of the atom shown in Figure 16.

[2 marks]

Model A

Model B

10.2 Compare model A with the model of the atom used today.

Use Figure 16.

[4 marks]

10.3 Chadwick's experiments showed the existence of neutrons in an atom.

This led to an understanding of isotopes.

Define the term 'isotopes'.

Refer to subatomic particles in your answer.

[2 marks]

Q3 · June 2024 · Paper 1 Foundation · Q9 · Paper 1 Higher · Q2 · [11 marks]

This question also needs Chemical changes.

This question is about the periodic table.

Sodium and potassium are in Group 1 of the periodic table.

09.1 Give **one** similarity and **one** difference between the electronic structures of sodium and potassium.

[2 marks]

Similarity

Difference

09.2 Group 1 elements react with water.

Give **two** observations made when potassium reacts with water.

[2 marks]

1

2

09.3 Potassium hydroxide solution is produced when potassium reacts with water.

What is the colour of universal indicator when added to potassium hydroxide solution?

Give **one** reason for your answer.

[2 marks]

Colour of universal indicator

Reason

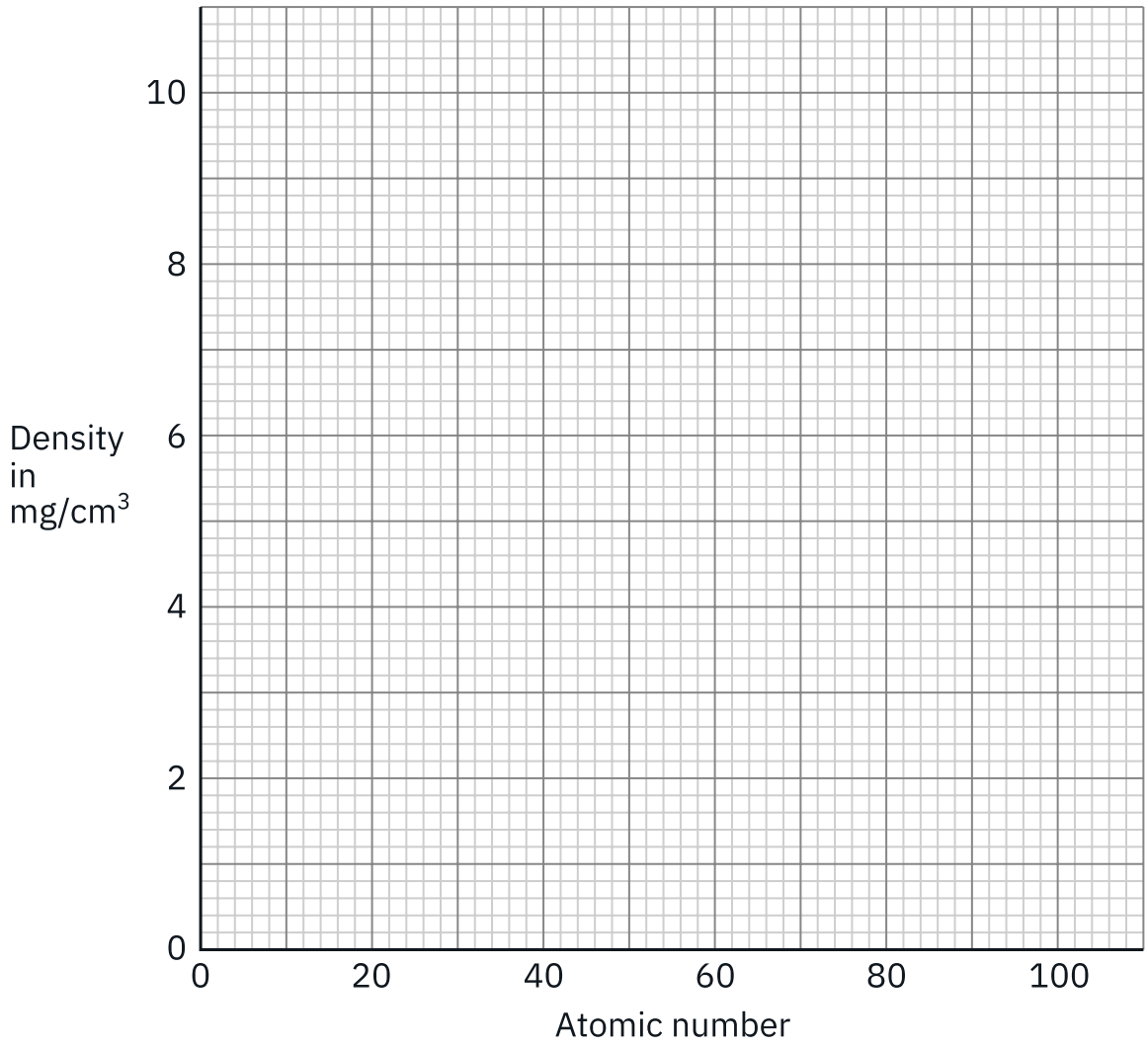
09.4 Table 4 shows the densities of some of the elements in Group 0 of the periodic table.

Table 4

Element	Atomic number	Density in mg/cm^3
Helium	2	0.2
Neon	10	0.8
Argon	18	1.6
Krypton	36	X
Xenon	54	5.4
Radon	86	9.1

Plot the data from Table 4 on Figure 15.

Figure 15



[2 marks]

Draw your answer on the figure above.

09.5 Estimate the density (X) of krypton.

Use Figure 15 and Table 4.

Density = _____ mg/cm^3

[1 mark]

09.6 The elements in Group 7 are called the halogens.

A more reactive halogen can displace a less reactive halogen from a solution of its salt.

Which combination of solutions will produce a reaction when mixed?

Tick (✓) **one** box.

Chlorine and potassium fluoride	☐
Chlorine and potassium bromide	☐
Bromine and potassium fluoride	☐
Bromine and potassium chloride	☐

[1 mark]

09.7 Which of the following describes the trends going down Group 7?

Tick (✓) **one** box.

Relative molecular mass decreases and boiling point decreases.	☐
Relative molecular mass decreases and boiling point increases.	☐
Relative molecular mass increases and boiling point decreases.	☐
Relative molecular mass increases and boiling point increases.	☐

[1 mark]

Q4 · June 2025 · Paper 1 Foundation · Q1 · [7 marks]

This question is about elements and compounds.

01.1 What is the name of the compound with the formula $ZnBr_2$?

Use the periodic table.

Tick (✓) **one** box.

Zinc bromide	☐
Zinc chloride	☐
Zinc iodide	☐

[1 mark]

01.2 A compound has the formula C_2H_6O

Table 1 shows information about a molecule of C_2H_6O

Table 1

Symbol of element	Name of element	Number of atoms of the element in a molecule of C_2H_6O
C		2
H	Hydrogen	
	Oxygen	1

Complete Table 1.

Use the periodic table.

[3 marks]

01.3 Potassium and sulfur react to produce potassium sulfide.

Write the word equation for this reaction.

+ →

[1 mark]

01.4 Aluminium reacts with fluorine to produce aluminium fluoride.

Balance the equation for this reaction.

$Al + F_2 \rightarrow 2AlF_3$

[2 marks]

Q5 · June 2025 · Paper 1 Foundation · Q7 · [10 marks]

This question also needs Chemical changes and Quantitative chemistry.

This question is about mixtures.

07.1 Draw **one** line from each type of mixture to the representation of that mixture.

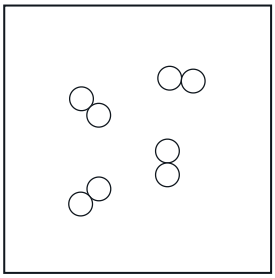
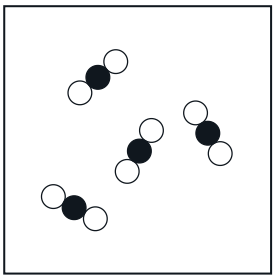
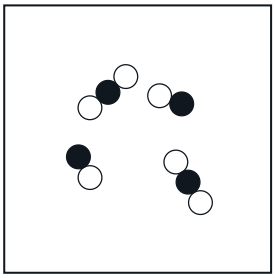
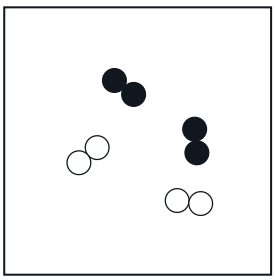
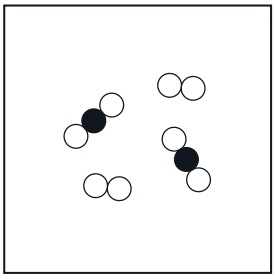
○ and • represent atoms of different elements.

Type of mixture Representation

Mixture of compounds

Mixture of a compound

and an element

Type of mixture	Representation
Mixture of compounds	
	
Mixture of a compound and an element	
	
	

[2 marks]

Draw your answer on the figure above.

07.2 A student had a mixture of salt and sand.

Salt is soluble in water.

Sand is insoluble in water.

Plan a method to obtain pure dry samples of salt and of sand from the mixture.

Figure 11 shows the chemicals and equipment that can be used.

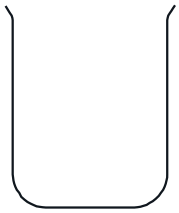
Figure 11



Mixture of salt and sand



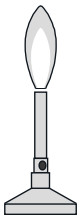
Bottle of water



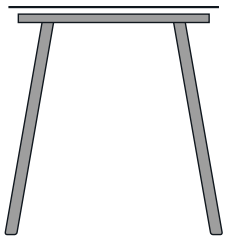
Beaker



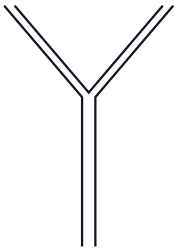
Glass rod



Bunsen burner



Tripod and gauze



Filter paper and funnel



Evaporating basin

[6 marks]

07.3 A mixture of salt and sand contained 16.0 g of salt.

The student obtained 13.6 g of salt after separation from the mixture.

Calculate the percentage yield of the salt.

Use the equation

% yield = (mass of salt obtained)/(mass of salt in mixture) x 100

% yield = _____ %

[2 marks]

Q6 · June 2025 · Paper 1 Foundation · Q8 · Paper 1 Higher · Q1 · [9 marks]

This question also needs Bonding, structure, and the properties of matter.

This question is about elements in the periodic table.

08.1 Describe where the non-metallic elements are found in the periodic table.

[1 mark]

08.2 Gallium (Ga) is a metallic element in Group 3.

Which of these properties of gallium is **not** typical of most metals?

Tick (✓) **one** box.

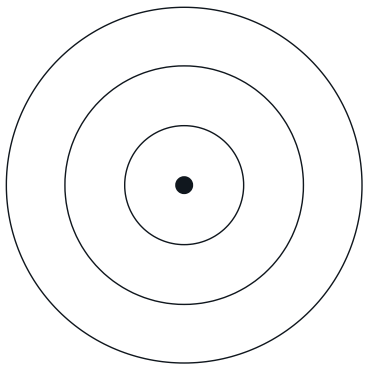
A boiling point above 1000 °C	☐
A melting point below 100 °C	☐
Conducts electricity when solid	☐
Forms positive ions	☐

[1 mark]

08.3 A sodium atom can be represented as $^{23}_{11}Na$

Complete Figure 12 to show the electronic structure of a sodium atom.

Figure 12



[1 mark]

Draw your answer on the figure above.

08.4 Mendeleev created an early periodic table.

Mendeleev placed most of the elements in order of atomic weight.

Tellurium and iodine were not placed in order of atomic weight.

Why did Mendeleev **not** place tellurium and iodine in order of atomic weight?

[1 mark]

08.5 Argon is an element in Group 0 of the periodic table.

Explain why argon is unreactive.

[2 marks]

08.6 An element X consists of two isotopes.

What is meant by ‘isotopes’?

Answer in terms of subatomic particles.

[2 marks]

08.7 Table 5 shows the mass numbers and percentage abundances of the isotopes of X.

Table 5

Mass number	Percentage abundance (%)
113	4
115	96

Which is the closest estimate to the relative atomic mass of X?

Tick (✓) **one** box.

~113	☐
~114	☐
~115	☐

[1 mark]

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