



**ST MARY'S SCIENCE
DEPARTMENT:
CHEMISTRY**

H

**GCSE CHEMISTRY HOMEWORK BOOK
TOPIC 1: ATOMIC STRUCTURE
STUDENT BOOK**

**YOU MUST ANSWER ALL THREE SECTIONS IN EACH
PART OF THE HOMEWORK TASKS**

NAME	
CLASS	
TEACHER	
FORM	

TASK	MARK	GRADE
1		
2		
3		
4		
5		
OVERALL		

**GCSE
CHEMISTRY
YEAR 9
TOPIC 1**



HOMEWORK SCHEDULE

Please use the following table to ensure each homework task is completed and submitted on time.

Carrying out these homework tasks can only increase your ability to gain a high grade in the GCSE examinations.

Failure to hand in work on time will lead to sanctions to complete this work.

Task	Submission Date	Completed?	On Time?
Task 1 Atoms, Elements and Compounds			
Task 2 Mixtures			
Task 3 Model of the Atom			
Task 4 The Periodic Table			
Task 5 Groups			



SCIENCE DEPARTMENT MARKING CODE

ID = Insufficient detail in answer

W = Wrong understanding of science

IR = Irrelevant information given.

V = This is too vague to get a mark.

AQ = Answer the question asked

R = Read the question/information

M = Maths mistake

BOD = Benefit of the doubt given.

E = Explain the answer further please.

U = Wrong units used.

SF = Wrong significant figures used.

SP = Wrong spelling of a technical term

SR = Same reason given more than once.

A circle means this lost you marks

An underline means this gained you marks

PLEASE READ

This homework booklet has made with custom selected examination questions and activities to assess your understanding in the concepts covered in class. This will increase your familiarity with the style of examination questions.

Carrying out these questions can only increase your ability to gain a high grade in the GCSE examination.

Thank you for your hard work in completing this book, and good luck.

Mr. Turnbull



TASK 1: ATOMS, ELEMENTS AND COMPOUNDS

SPEC CHECK

Content	Achieved?
<p>All substances are made of atoms. An atom is the smallest part of an element that can exist.</p> <p>Atoms of each element are represented by a chemical symbol, e.g. O represents an atom of oxygen, Na represents an atom of sodium.</p> <p>There are about 100 different elements. Elements are shown in the periodic table.</p> <p>Compounds are formed from elements by chemical reactions.</p> <p>Chemical reactions always involve the formation of one or more new substances, and often involve a detectable energy change.</p> <p>Compounds contain two or more elements chemically combined in fixed proportions and can be represented by formulae using the symbols of the atoms from which they were formed. Compounds can only be separated into elements by chemical reactions.</p> <p>Chemical reactions can be represented by word equations or equations using symbols and formulae.</p> <p>Students will be supplied with a periodic table for the exam and should be able to:</p> <ul style="list-style-type: none"> • Use the names and symbols of the first 20 elements in the periodic table, the elements in Groups 1 and 7, and other elements in this specification • Name compounds of these elements from given formulae or symbol equations • Write word equations for the reactions in this specification • Write formulae and balanced chemical equations for the reactions in this specification. <p>(HT only) write balanced half equations and ionic equations where appropriate.</p>	



Target Setting

In this assessed piece of work, what target should I look to achieve in completing this task?
Please refer to your marking feedback for your target.

From your previous work, fill in the following boxes with your personal progress in Physics.

What Topics Do I Know Well?

What Topics Do I Need to Revise?



SECTION A

This is a revision question on a previous topic.

You should aim to spend **10 minutes** answering this section.

1. An atom of beryllium can be represented as ${}^9_4\text{Be}$.

Describe the structure of the beryllium atom.

In your answer make reference to the number of sub-atomic particles and where they are found in the atom.

[5 Marks]

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SECTION B

This is a question to revise understanding carried out in lesson.

You should aim to spend **10 minutes** answering this section.

1. Dalton was a scientist in the early 19th century. He gave each element a symbol.

Figure 1 shows some of Dalton's symbols.

element	symbol
carbon	●
hydrogen	⊙
nitrogen	⊕
oxygen	○
sulfur	⊕

Figure 2 shows the symbol Dalton used for a substance.



1.1 What is the modern chemical formula for this substance?

[1 mark]

1.2 Give **two** advantages of using modern symbols rather than Dalton's symbols.

[2 marks]

Dalton thought that the atoms of each element were the same. Now we know that elements can have different atoms, for example, chlorine has two different atoms, $^{35}_{17}\text{Cl}$ and $^{37}_{17}\text{Cl}$.

1.3 What name is given to different types of atom of the same element?

[1 mark]

1.4 How are the structures of the chlorine atoms $^{35}_{17}\text{Cl}$ and $^{37}_{17}\text{Cl}$ different?

[1 mark]



SECTION C

This is a challenge question to extend your understanding.

You should aim to spend **10 minutes** answering this section.

1.1 The radius of a magnesium atom is 0.160 nm.

The radius of a nucleus is about $\frac{1}{10000}$ that of an atom.

Calculate the radius of a magnesium nucleus.

Give your answer in standard form.

[2 marks]

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Radius of a magnesium nucleus = nm

1.2 The radius of a magnesium ion is 7.2×10^{-11} m.

Explain the difference in size between the magnesium atom and magnesium ion.

[2 marks]

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FEEDBACK SHEET

Overall Mark:	/14	GRADE ACHIEVED:	
Section A: Mark	/5	9 <input type="checkbox"/>	5 <input type="checkbox"/>
Section B: Mark	/5	8 <input type="checkbox"/>	4 <input type="checkbox"/>
Section C: Mark	/4	7 <input type="checkbox"/>	3 <input type="checkbox"/>
		6 <input type="checkbox"/>	U <input type="checkbox"/>

Knowledge and understanding shown	Unsatisfactory	Satisfactory	Good	Outstanding
Strengths:	<input type="checkbox"/> Basic Knowledge of Concepts <input type="checkbox"/> Quality of Written Communication <input type="checkbox"/> Working Scientifically <input type="checkbox"/> Answering Examination Questions <input type="checkbox"/> Analytical Skills Others (Topic Specific)			
Areas to Improve:	<input type="checkbox"/> Basic Knowledge of Concepts <input type="checkbox"/> Quality of Written Communication <input type="checkbox"/> Working Scientifically <input type="checkbox"/> Answering Examination Questions <input type="checkbox"/> Analytical Skills Others (Topic Specific)			
Progress:	Unsatisfactory	Satisfactory	Good	Outstanding
Working:	Below	In line with	Above	(your target)
Effort:	Poor	Inconsistent	Good	Excellent

To improve further you need to:

<input type="checkbox"/> Carry out independent revision. <input type="checkbox"/> Complete outstanding work. <input type="checkbox"/> Make corrections as indicated by the teacher. <input type="checkbox"/> Attend intervention for this topic <input type="checkbox"/> Include more information in responses. <input type="checkbox"/> Include more key words in responses. <input type="checkbox"/> Attend departmental revision sessions. <input type="checkbox"/> Read the questions carefully. <input type="checkbox"/> Explain your answers in more detail. <input type="checkbox"/> Carry out revision on Seneca Learning.	<input type="checkbox"/> Revise the equations. <input type="checkbox"/> Check the units on answers. <input type="checkbox"/> Check the correct amount of sig figs on answers. <input type="checkbox"/> Check to convert values correctly. <input type="checkbox"/> Show your full working out. <input type="checkbox"/> Check your calculations. <input type="checkbox"/> Revise the science investigative skills. <input type="checkbox"/> Revise the key concepts of the topics. <input type="checkbox"/> Thoroughly check your work for mistakes. Other:
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Student response

**TASK 2: MIXTURES****SPEC CHECK**

Content	Achieved?
<p>A mixture consists of two or more elements or compounds not chemically combined together. The chemical properties of each substance in the mixture are unchanged.</p> <p>Mixtures can be separated by physical processes such as filtration, crystallisation, simple distillation, fractional distillation and chromatography. These physical processes do not involve chemical reactions and no new substances are made.</p> <p>Students should be able to:</p> <ul style="list-style-type: none">• describe, explain and give examples of the specified processes of separation• suggest suitable separation and purification techniques for mixtures when given appropriate information.	

Target Setting

In this assessed piece of work, what target should I look to achieve in completing this task?
Please refer to your marking feedback for your target.

From your previous work, fill in the following boxes with your personal progress in Physics.

What Topics Do I Know Well?

What Topics Do I Need to Revise?

**SECTION A**

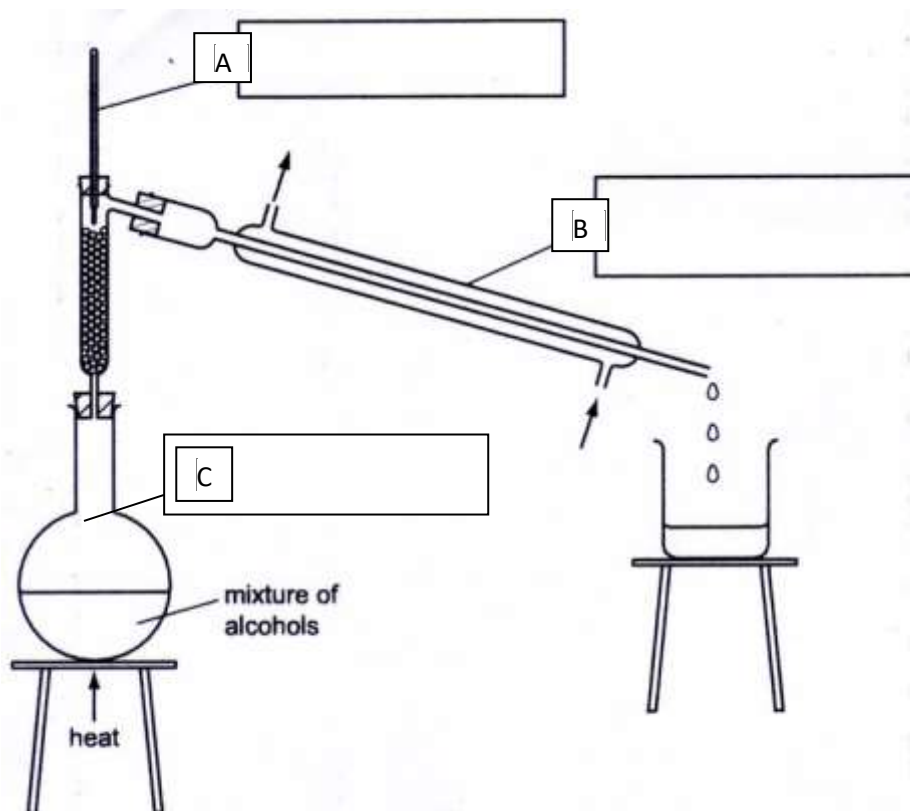
This is a revision question on a previous topic.

You should aim to spend **10 minutes** answering this section.

1. A student separated a mixture of two alcohols, ethanol (boiling point 78 °C) and butanol (boiling point 118 °C).

The apparatus is shown in **Figure 1**.

Figure 1



1.1 Complete the boxes in **Figure 1** to identify the pieces of apparatus labelled **A**, **B** and **C**.

[3 marks]

1.2 What is the name of this separation process?

[1 mark]

1.3 Suggest why the first liquid to collect in the beaker is ethanol.

[1 mark]



1.4 Alcohols are flammable.

Suggest how the mixture of alcohols should be safely heated so that ethanol can be collected.

[1 mark]

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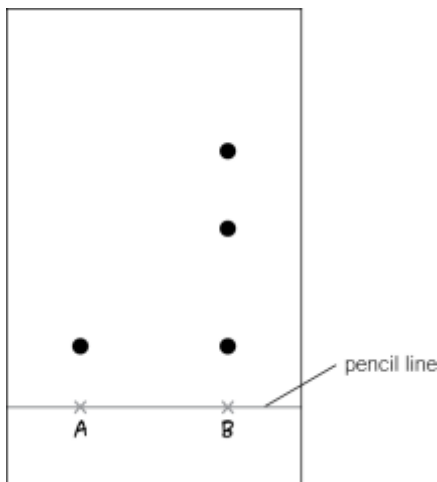


SECTION B

This is a question to revise understanding carried out in lesson.

You should aim to spend **10 minutes** answering this section.

1. A student investigated the food colouring used in two fizzy orange drinks labelled A and B. The student produced the chromatogram shown below.



1.1 Why is the line at the bottom of a chromatogram drawn in pencil rather than in pen?

[1 Mark]

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1.2 Suggest three conclusions that can be made from the student's results.

[3 Marks]

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1.3 Suggest why it is important to be able to identify the food colouring additives used in fizzy drinks.

[1 Mark]

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SECTION C

This is a challenge question to extend your understanding.

You should aim to spend **10 minutes** answering this section.

1. Sodium metal and chlorine gas react together to produce sodium chloride, NaCl.

1.1 Complete and balance the symbol equation for this reaction.

[2 Marks]



1.2 Rock salt is a mixture of salt (sodium chloride) and sand. Describe how you would separate rock salt to obtain salt crystals and pure dry sand.

[6 Marks]

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FEEDBACK SHEET

Overall Mark:	/18	GRADE ACHIEVED:	
Section A: Mark	/5	9 <input type="checkbox"/>	5 <input type="checkbox"/>
Section B: Mark	/5	8 <input type="checkbox"/>	4 <input type="checkbox"/>
Section C: Mark	/8	7 <input type="checkbox"/>	3 <input type="checkbox"/>
		6 <input type="checkbox"/>	U <input type="checkbox"/>

Knowledge and understanding shown	Unsatisfactory	Satisfactory	Good	Outstanding
Strengths:	<input type="checkbox"/> Basic Knowledge of Concepts <input type="checkbox"/> Quality of Written Communication <input type="checkbox"/> Working Scientifically <input type="checkbox"/> Answering Examination Questions <input type="checkbox"/> Analytical Skills Others (Topic Specific)		<input type="checkbox"/> Applications of Concepts <input type="checkbox"/> Mathematical Skills <input type="checkbox"/> Experimental Technique <input type="checkbox"/> Previous Topics <input type="checkbox"/> Problem Solving	
Areas to Improve:	<input type="checkbox"/> Basic Knowledge of Concepts <input type="checkbox"/> Quality of Written Communication <input type="checkbox"/> Working Scientifically <input type="checkbox"/> Answering Examination Questions <input type="checkbox"/> Analytical Skills Others (Topic Specific)		<input type="checkbox"/> Applications of Concepts <input type="checkbox"/> Mathematical Skills <input type="checkbox"/> Experimental Technique <input type="checkbox"/> Previous Topics <input type="checkbox"/> Problem Solving	
Progress:	Unsatisfactory	Satisfactory	Good	Outstanding
Working:	Below	In line with	Above	(your target)
Effort:	Poor	Inconsistent	Good	Excellent

To improve further you need to:

- | | |
|--|--|
| <ul style="list-style-type: none"> <input type="checkbox"/> Carry out independent revision. <input type="checkbox"/> Complete outstanding work. <input type="checkbox"/> Make corrections as indicated by the teacher. <input type="checkbox"/> Attend intervention for this topic <input type="checkbox"/> Include more information in responses. <input type="checkbox"/> Include more key words in responses. <input type="checkbox"/> Attend departmental revision sessions. <input type="checkbox"/> Read the questions carefully. <input type="checkbox"/> Explain your answers in more detail. <input type="checkbox"/> Carry out revision on Seneca Learning. | <ul style="list-style-type: none"> <input type="checkbox"/> Revise the equations. <input type="checkbox"/> Check the units on answers. <input type="checkbox"/> Check the correct amount of sig figs on answers. <input type="checkbox"/> Check to convert values correctly. <input type="checkbox"/> Show your full working out. <input type="checkbox"/> Check your calculations. <input type="checkbox"/> Revise the science investigative skills. <input type="checkbox"/> Revise the key concepts of the topics. <input type="checkbox"/> Thoroughly check your work for mistakes. <p>Other:</p> |
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Student response



TASK 3: MODEL OF THE ATOM

SPEC CHECK

Content	Achieved?
<p>New experimental evidence may lead to a scientific model being changed or replaced.</p> <p>Before the discovery of the electron, atoms were thought to be tiny spheres that could not be divided.</p> <p>The discovery of the electron led to the plum pudding model of the atom. The plum pudding model suggested that the atom is a ball of positive charge with negative electrons embedded in it.</p> <p>The results from the alpha particle scattering experiment led to the conclusion that the mass of an atom was concentrated at the centre (nucleus) and that the nucleus was charged. This nuclear model replaced the plum pudding model.</p> <p>Niels Bohr adapted the nuclear model by suggesting that electrons orbit the nucleus at specific distances. The theoretical calculations of Bohr agreed with experimental observations.</p> <p>Later experiments led to the idea that the positive charge of any nucleus could be subdivided into a whole number of smaller particles, each particle having the same amount of positive charge. The name proton was given to these particles.</p> <p>The experimental work of James Chadwick provided the evidence to show the existence of neutrons within the nucleus. This was about 20 years after the nucleus became an accepted scientific idea.</p>	
<p>Students should be able to describe:</p> <p>Why the new evidence from the scattering experiment led to a change in the atomic model.</p> <p>the difference between the plum pudding model of the atom and the nuclear model of the atom.</p>	



Target Setting

In this assessed piece of work, what target should I look to achieve in completing this task?
Please refer to your marking feedback for your target.

From your previous work, fill in the following boxes with your personal progress in Physics.

What Topics Do I Know Well?

What Topics Do I Need to Revise?

**SECTION A**

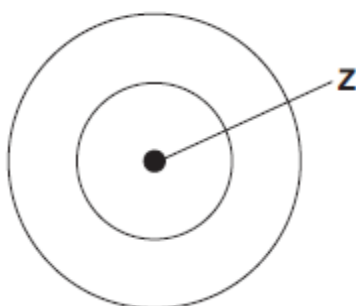
This is a revision question on a previous topic.

You should aim to spend **10 minutes** answering this section.

1. There are eight elements in the second row (lithium to neon) of the periodic table.

Figure 1 shows an atom with two energy levels (shells).

Figure 1



1.1 Complete **Figure 1** to show the electronic structure of a boron atom.

[1 Mark]

1.2 What does the central part labelled **Z** represent in **Figure 1**?

[1 Mark]

1.3 Name the sub-atomic particles in part **Z** of a boron atom.

Give the relative charges of these sub-atomic particles.

[3 Marks]

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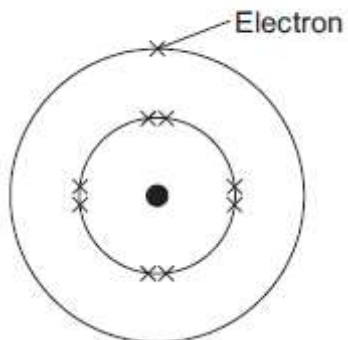
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The electronic structure of a neon atom shown in **Figure 2** is **not** correct.

Figure 2



1.4 Explain what is wrong with the electronic structure shown in **Figure 2**.

[3 Marks]

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SECTION B

This is a question to revise understanding carried out in lesson.

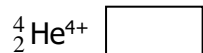
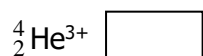
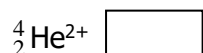
You should aim to spend **10 minutes** answering this section.

1.1 An alpha particle is a helium nucleus.

Which chemical symbol represents a helium nucleus?

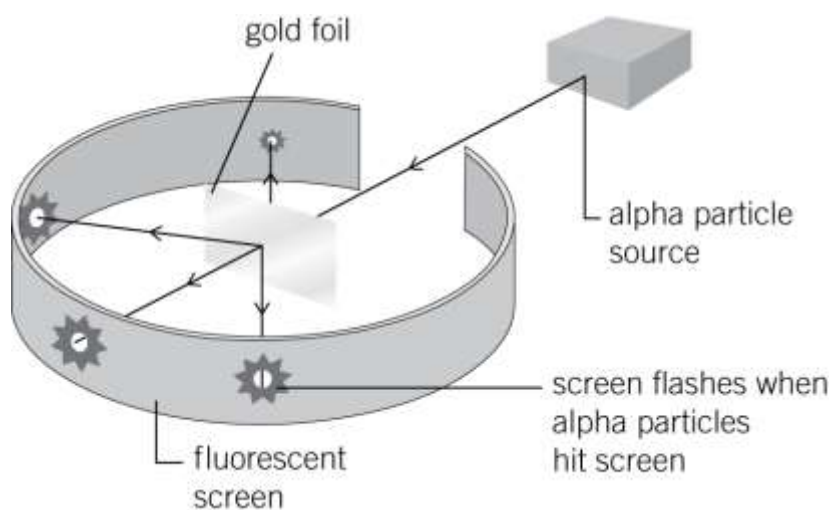
Tick **one** box.

[1 Mark]



Scientists used alpha particles to investigate models of the atom.

Figure 4 shows an alpha particle scattering experiment.



Explain how scientists used the results from the experiment to:

Disprove the plum pudding model

Give evidence for the nuclear model.

[4 Marks]

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**SECTION C**

This is a challenge question to extend your understanding.

You should aim to spend **10 minutes** answering this section.

1. This question is about atomic structure.

1.1 Atoms contain subatomic particles.

Table 2 shows properties of two subatomic particles.

Complete **Table 2**.

[2 marks]

Table 2

Name of particle	Relative mass	Relative charge
neutron		
		+1

An element **X** has two isotopes.

The isotopes have different mass numbers.

1.2 Define mass number.

[1 mark]

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1.3 Why is the mass number different in the two isotopes?

[1 mark]

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1.4 The model of the atom changed as new evidence was discovered.

The plum pudding model suggested that the atom was a ball of positive charge with electrons embedded in it.

Evidence from the alpha particle scattering experiment led to a change in the model of the atom from the plum pudding model.

Explain how.

[4 marks]

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FEEDBACK SHEET

Overall Mark:	/21	GRADE ACHIEVED:	
Section A: Mark	/8	9 <input type="checkbox"/>	5 <input type="checkbox"/>
Section B: Mark	/5	8 <input type="checkbox"/>	4 <input type="checkbox"/>
Section C: Mark	/8	7 <input type="checkbox"/>	3 <input type="checkbox"/>
		6 <input type="checkbox"/>	U <input type="checkbox"/>

Knowledge and understanding shown	Unsatisfactory	Satisfactory	Good	Outstanding
Strengths:	<input type="checkbox"/> Basic Knowledge of Concepts <input type="checkbox"/> Quality of Written Communication <input type="checkbox"/> Working Scientifically <input type="checkbox"/> Answering Examination Questions <input type="checkbox"/> Analytical Skills Others (Topic Specific)		<input type="checkbox"/> Applications of Concepts <input type="checkbox"/> Mathematical Skills <input type="checkbox"/> Experimental Technique <input type="checkbox"/> Previous Topics <input type="checkbox"/> Problem Solving	
Areas to Improve:	<input type="checkbox"/> Basic Knowledge of Concepts <input type="checkbox"/> Quality of Written Communication <input type="checkbox"/> Working Scientifically <input type="checkbox"/> Answering Examination Questions <input type="checkbox"/> Analytical Skills Others (Topic Specific)		<input type="checkbox"/> Applications of Concepts <input type="checkbox"/> Mathematical Skills <input type="checkbox"/> Experimental Technique <input type="checkbox"/> Previous Topics <input type="checkbox"/> Problem Solving	
Progress:	Unsatisfactory	Satisfactory	Good	Outstanding
Working:	Below	In line with	Above	(your target)
Effort:	Poor	Inconsistent	Good	Excellent

To improve further you need to:

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Student response



TASK 4: THE PERIODIC TABLE

SPEC CHECK

Content	Achieved?
<p>The elements in the periodic table are arranged in order of atomic (proton) number and so that elements with similar properties are in columns, known as groups. The table is called a periodic table because similar properties occur at regular intervals.</p> <p>Elements in the same group in the periodic table have the same number of electrons in their outer shell (outer electrons) and this gives them similar chemical properties.</p>	
<p>Students should be able to:</p> <ul style="list-style-type: none"> • Explain how the position of an element in the periodic table is related to the arrangement of electrons in its atoms and hence to its atomic number • Predict possible reactions and probable reactivity of elements from their positions in the periodic table. 	
<p>Before the discovery of protons, neutrons and electrons, scientists attempted to classify the elements by arranging them in order of their atomic weights.</p> <p>The early periodic tables were incomplete and some elements were placed in inappropriate groups if the strict order of atomic weights was followed.</p> <p>Mendeleev overcame some of the problems by leaving gaps for elements that he thought had not been discovered and in some places changed the order based on atomic weights.</p> <p>Elements with properties predicted by Mendeleev were discovered and filled the gaps. Knowledge of isotopes made it possible to explain why the order based on atomic weights was not always correct.</p> <p>Students should be able to describe these steps in the development of the periodic table.</p>	



Target Setting

In this assessed piece of work, what target should I look to achieve in completing this task?
Please refer to your marking feedback for your target.

From your previous work, fill in the following boxes with your personal progress in Physics.

What Topics Do I Know Well?

What Topics Do I Need to Revise?



SECTION A

This is a revision question on a previous topic.

You should aim to spend **10 minutes** answering this section.

1. This question is about the periodic table.

In the 19th century, some scientists tried to classify the elements by arranging them in order of their atomic weights.

Figure 1 shows the periodic table Mendeleev produced in 1869.

His periodic table was more widely accepted than previous versions.

Figure 1

	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7
Period 1	H						
Period 2	Li	Be	B	C	N	O	F
Period 3	Na	Mg	Al	Si	P	S	Cl
Period 4	K Cu	Ca Zn	* *	Ti *	V As	Cr Se	Mn Br
Period 5	Rb Ag	Sr Cd	Y In	Zr Sn	Nb Sb	Mo Te	* I

1.1 The atomic weight of tellurium (Te) is 128 and that of iodine (I) is 127

Why did Mendeleev reverse the order of these two elements?

[1 mark]

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1.2 Mendeleev left spaces marked with an asterisk *

He left these spaces because he thought missing elements belonged there.

Why did Mendeleev's periodic table become more widely accepted than previous versions?

[3 marks]

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1.3 Mendeleev arranged the elements in order of their atomic weight.

What is the modern name for atomic weight?

[1 mark]

Tick **one** box.

Atomic number

Mass number

Relative atomic mass

Relative formula mass

1.4 Complete the sentence.

[1 mark]

In the modern periodic table, the elements are arranged in order of



SECTION B

This is a question to revise understanding carried out in lesson.

You should aim to spend **10 minutes** answering this section.

1. This question is about atomic structure and elements.

Complete the sentences.

1.1 The atomic number of an atom is the number of _____

[1 mark]

1.2 The mass number of an atom is the number of _____

[1 mark]

1.3 Explain why an atom has no overall charge.

Use the relative electrical charges of sub-atomic particles in your explanation.

[2 marks]

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1.4 Explain why fluorine and chlorine are in the same group of the periodic table.

Give the electronic structures of fluorine and chlorine in your explanation.

[2 marks]

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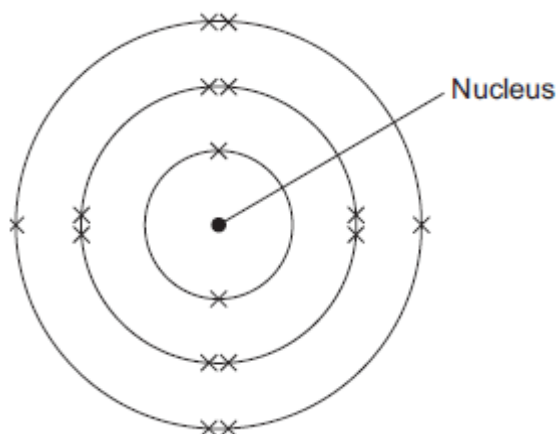
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1.5 The diagram shows the electronic structure of an atom of a non-metal.



What is the chemical symbol of this non-metal?

Tick (✓) **one** box.

[1 mark]

Ar

O

S

Si

When elements react, their atoms join with other atoms to form compounds.

Complete the sentences.

1.6 Compounds formed when non-metals react with metals consist of particles called

_____.

[1 mark]

1.7 Compounds formed from only non-metals consist of particles called _____.

[1 mark]



SECTION C

This is a challenge question to extend your understanding.

You should aim to spend **10 minutes** answering this section.

1. This question is about the Periodic Table.

In 1864 John Newlands produced a version of the periodic table. Newlands placed all the elements that had been discovered into his table of octaves. He thought every eighth element was similar.

Figure 2 shows part of Newlands' version.

Octaves →

H 1	F 8	Cl 15	Co and Ni 22	Br 29	Pd 36	I 42	Pt and Ir 50
Li 2	Na 9	K 16	Cu 23	Rb 30	Ag 37	Cs 44	Tl 53
Gl 3	Mg 10	Ca 17	Zn 25	Sr 31	Cd 34	Ba and V 45	Pb 54

Figure 2

1.1 Suggest **one** reason why Newlands placed hydrogen in the octave shown.

[1 Mark]

Five years later Mendeleev produced his version of the periodic table.

Figure 3 shows part of Mendeleev's version.

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7
H	Be	B	C	N	O	F
Li						
Na	Mg	Al	Si	P	S	Cl
K	Ca		Ti	V	Cr	Mn
Cu	Zn		As	Se	Br	

Figure 3



1.2 Mendeleev's table was an improvement on Newlands' table.

Give **two** reasons why.

[2 Marks]

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1.3 Both Newlands and Mendeleev placed copper and sodium in the same group / octave.

Explain why, giving examples of their properties, copper and sodium should be in different groups.

[4 Marks]

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FEEDBACK SHEET

Overall Mark:	/22	GRADE ACHIEVED:	
Section A: Mark	/6	9 <input type="checkbox"/>	5 <input type="checkbox"/>
Section B: Mark	/9	8 <input type="checkbox"/>	4 <input type="checkbox"/>
Section C: Mark	/7	7 <input type="checkbox"/>	3 <input type="checkbox"/>
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Knowledge and understanding shown	Unsatisfactory	Satisfactory	Good	Outstanding
Strengths:	<input type="checkbox"/> Basic Knowledge of Concepts <input type="checkbox"/> Quality of Written Communication <input type="checkbox"/> Working Scientifically <input type="checkbox"/> Answering Examination Questions <input type="checkbox"/> Analytical Skills Others (Topic Specific)		<input type="checkbox"/> Applications of Concepts <input type="checkbox"/> Mathematical Skills <input type="checkbox"/> Experimental Technique <input type="checkbox"/> Previous Topics <input type="checkbox"/> Problem Solving	
Areas to Improve:	<input type="checkbox"/> Basic Knowledge of Concepts <input type="checkbox"/> Quality of Written Communication <input type="checkbox"/> Working Scientifically <input type="checkbox"/> Answering Examination Questions <input type="checkbox"/> Analytical Skills Others (Topic Specific)		<input type="checkbox"/> Applications of Concepts <input type="checkbox"/> Mathematical Skills <input type="checkbox"/> Experimental Technique <input type="checkbox"/> Previous Topics <input type="checkbox"/> Problem Solving	
Progress:	Unsatisfactory	Satisfactory	Good	Outstanding
Working:	Below	In line with	Above	(your target)
Effort:	Poor	Inconsistent	Good	Excellent

To improve further you need to:

<input type="checkbox"/> Carry out independent revision. <input type="checkbox"/> Complete outstanding work. <input type="checkbox"/> Make corrections as indicated by the teacher. <input type="checkbox"/> Attend intervention for this topic <input type="checkbox"/> Include more information in responses. <input type="checkbox"/> Include more key words in responses. <input type="checkbox"/> Attend departmental revision sessions. <input type="checkbox"/> Read the questions carefully. <input type="checkbox"/> Explain your answers in more detail. <input type="checkbox"/> Carry out revision on Seneca Learning.	<input type="checkbox"/> Revise the equations. <input type="checkbox"/> Check the units on answers. <input type="checkbox"/> Check the correct amount of sig figs on answers. <input type="checkbox"/> Check to convert values correctly. <input type="checkbox"/> Show your full working out. <input type="checkbox"/> Check your calculations. <input type="checkbox"/> Revise the science investigative skills. <input type="checkbox"/> Revise the key concepts of the topics. <input type="checkbox"/> Thoroughly check your work for mistakes. Other:
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Student response



TASK 5: GROUPS

SPEC CHECK

Content	Achieved?
<p>The elements in Group 0 of the periodic table are called the noble gases. They are unreactive and do not easily form molecules because their atoms have stable arrangements of electrons. The noble gases have eight electrons in their outer shell, except for helium, which has only two electrons.</p> <p>The boiling points of the noble gases increase with increasing relative atomic mass (going down the group).</p>	
<p>Students should be able to:</p> <ul style="list-style-type: none"> • Explain how properties of the elements in Group 0 depend on the outer shell of electrons of the atoms • Predict properties from given trends down the group. 	
<p>The elements in Group 1 of the periodic table are known as the alkali metals and have characteristic properties because of the single electron in their outer shell.</p> <p>Students should be able to describe the reactions of the first three alkali metals with oxygen, chlorine and water.</p> <p>In Group 1, the reactivity of the elements increases going down the group.</p>	
<p>Students should be able to:</p> <ul style="list-style-type: none"> • Explain how properties of the elements in Group 1 depend on the outer shell of electrons of the atoms • Predict properties from given trends down the group. 	
<p>The elements in Group 7 of the periodic table are known as the halogens and have similar reactions because they all have seven electrons in their outer shell. The halogens are non-metals and consist of molecules made of pairs of atoms.</p> <p>Students should be able to describe the nature of the compounds formed when chlorine, bromine and iodine react with metals and non-metals.</p> <p>In Group 7, the further down the group an element is the higher its relative molecular mass, melting point and boiling point.</p> <p>In Group 7, the reactivity of the elements decreases going down the group.</p> <p>A more reactive halogen can displace a less reactive halogen from an aqueous solution of its salt.</p>	
<p>Students should be able to:</p> <ul style="list-style-type: none"> • Explain how properties of the elements in Group 7 depend on the outer shell of electrons of the atoms • Predict properties from given trends down the group. 	



Target Setting

In this assessed piece of work, what target should I look to achieve in completing this task?
Please refer to your marking feedback for your target.

From your previous work, fill in the following boxes with your personal progress in Physics.

What Topics Do I Know Well?

What Topics Do I Need to Revise?

**SECTION A**

This is a revision question on a previous topic.

You should aim to spend **10 minutes** answering this section.

1. This question is about elements in the periodic table.

1.1 What order did scientists use to arrange elements in early periodic tables?

[1 mark]

.....

.....

1.2 In the early periodic tables some elements were placed in the wrong groups.

Mendeleev overcame this in his periodic table.

Give **one** way Mendeleev did this.

[1 mark]

.....

.....

Table 2 shows the boiling points of fluorine, chlorine and bromine.

Table 2

Element	Boiling point in °C
Fluorine	-186
Chlorine	-34
Bromine	+59

1.3 Explain why the boiling points in **Table 2** are low.

[2 marks]

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1.4 Explain the trend in the boiling points in **Table 2**.

[3 marks]

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1.5 Explain why neon is unreactive.

Give the electronic structure of neon in your answer.

[2 marks]

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**SECTION B**

This is a question to revise understanding carried out in lesson.

You should aim to spend **10 minutes** answering this section.

1.1 State why, in terms of electrons, sodium is in Group 1.

[1 Mark]

Sodium reacts with chlorine to produce sodium chloride.

Sodium chloride is an ionic compound.

1.2 Give the formula of the sodium ions and chloride ions present in sodium chloride.

[1 Mark]

A teacher demonstrated the reactions of sodium and potassium with water.

Figure 1 shows the demonstration.



Figure 1

The teacher and students wore eye protection when watching the demonstration.

1.3 Give **one** other safety precaution used in the demonstration.

[1 Mark]



1.4 Describe what you would have observed when sodium and potassium were reacted with water. Explain why there is a difference between sodium and potassium in their reactivity with water.

[6 Marks]

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SECTION C

This is a challenge question to extend your understanding.

You should aim to spend **10 minutes** answering this section.

1. Table 1 shows the melting and boiling points of Group 7 elements.

Element	Melting point in °C	Boiling point in °C
fluorine	-202	-188
chlorine	-101	-35
bromine	-7	-59
iodine	114	184

Table 1

1.1 Which Group 7 element is a solid at room temperature?

[1 Mark]

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1.2 Which Group 7 element is a liquid for the greatest temperature range?

[1 Mark]

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Chlorine reacts with potassium bromide to produce potassium chloride and bromine.

1.3 Complete and balance the symbol equation for this reaction.

[2 Marks]



1.4 What, if anything, will happen when iodine is added to potassium bromide?

Explain your answer.

[3 Marks]

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FEEDBACK SHEET

Overall Mark:	/25	GRADE ACHIEVED:	
Section A: Mark	/9	9 <input type="checkbox"/>	5 <input type="checkbox"/>
Section B: Mark	/9	8 <input type="checkbox"/>	4 <input type="checkbox"/>
Section C: Mark	/7	7 <input type="checkbox"/>	3 <input type="checkbox"/>
		6 <input type="checkbox"/>	U <input type="checkbox"/>

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Student response



Acknowledgements

This document has been produced by Mr J Turnbull.

All relevant information has been credited in the document.

This document has been produced for educational purposes only.

This document has been produced for the AQA GCSE Science Specification.

