

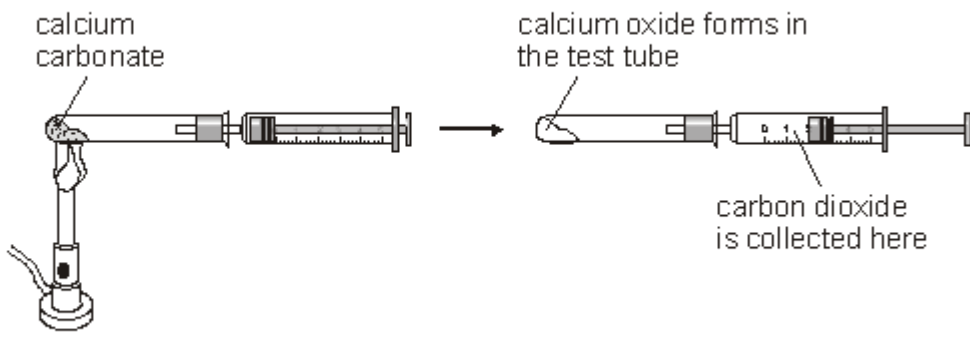
Q1.

A science teacher showed her class three experiments, A, B and C.
The experiments and the word equations for the reactions that took place are shown below.
All the experiments were done in a fume cupboard.

experiment A

calcium carbonate

calcium carbonate is heated




calcium oxide forms in the test tube

carbon dioxide is collected here

word equation calcium carbonate \longrightarrow calcium oxide + carbon dioxide

experiment B

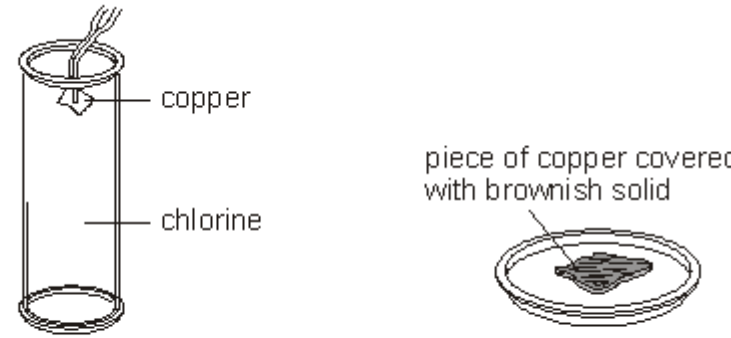
iron filings and sulphur are heated together



word equation iron + sulphur \longrightarrow iron sulphide

experiment C

hot copper is added to chlorine



piece of copper covered with brownish solid

word equation copper + chlorine \longrightarrow _____

(a) From the substances in experiments A, B and C, above, give the name of:

(i) **one** metallic element;

.....

1 mark

(ii) **one** non-metallic element;

.....

1 mark

(iii) **two** compounds.

..... and

1 mark

(b) In experiment B, the iron filings weighed 2.0 g at the beginning of the experiment and the iron sulphide produced weighed 2.8 g.

Explain this increase in mass.

.....
.....

1 mark

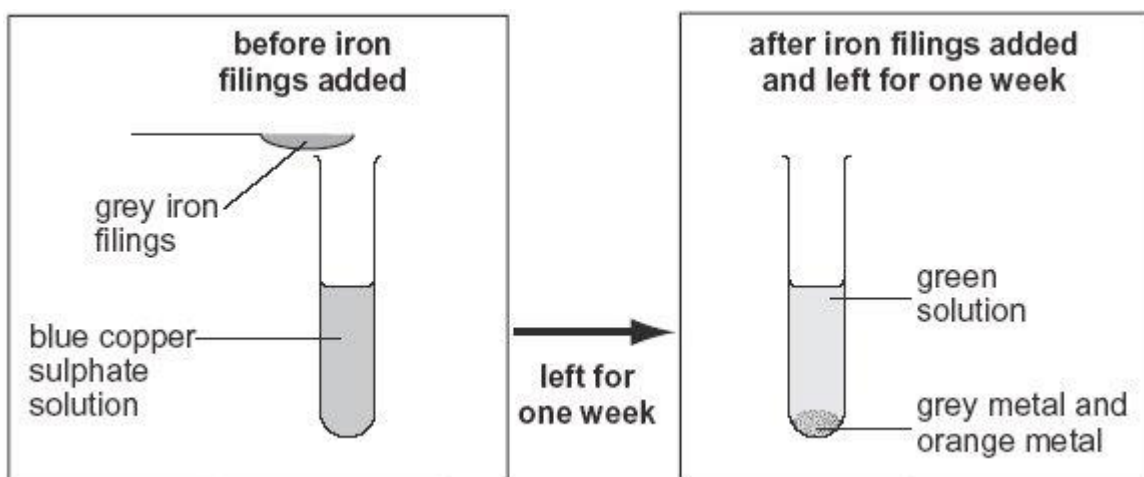
(c) Complete the word equation for the chemical reaction in experiment C.

copper + chlorine ?

1 mark
maximum 5 marks

Q2.

Joanne added iron filings to copper sulphate solution. She observed the reaction after one week.



(a) What evidence in the diagrams shows that a chemical reaction has taken place?

.....

1 mark

(b) The reaction between iron and copper sulphate is a **displacement** reaction.

(i) Give the name of the orange metal visible after one week.

.....

1 mark

(ii) What is the name of the compound formed in this reaction?

.....

1 mark

(iii) Joanne poured the green solution into another test tube. She added some copper pieces to the solution.

Will a displacement reaction occur?

yes no

Explain your answer.

.....
.....

1 mark

(c) Part of the reactivity series of metals is shown below.

potassium	most reactive
lithium	↑
calcium	
aluminium	
zinc	
lead	least reactive

Use the information above.

Which **two** metals would react with aluminium nitrate in a displacement reaction?

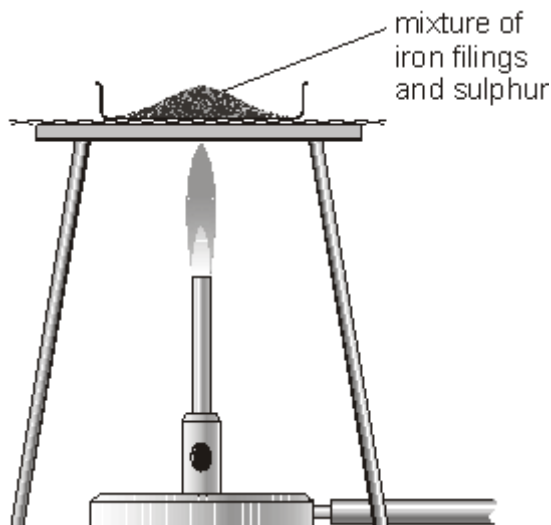
Tick the **two** correct boxes.

calcium	<input type="checkbox"/>	potassium	<input type="checkbox"/>
zinc	<input type="checkbox"/>	lead	<input type="checkbox"/>

1 mark
maximum 5 marks

Q3.

A teacher mixed iron filings with sulphur on a metal tray. She heated the mixture in a fume cupboard. Sulphur is yellow. Iron filings are grey.



The mixture glowed very brightly. The teacher turned off the bunsen burner. The glow spread through the mixture. When the mixture cooled, a black solid called iron sulphide was left.

- (a) From this information, give **one** way you can tell that a chemical reaction took place.

.....
.....

1 mark

- (b) What type of substance is each of the chemicals involved in this reaction?
Choose from:

**metallic
element**

mixture

**non-metallic
element**

compound

iron

sulphur

iron sulphide

2 marks

- (c) Raj held a magnet near to each of the three chemicals.

By each chemical in the table, write **yes** or **no** to show if the chemical was magnetic.

One has been done for you.

chemical	Was the chemical magnetic?
sulphur	
iron	
iron sulphide	no

1 mark

- (d) (i) When iron is heated with sulphur, iron sulphide is formed.
Give the name of the solid formed when **zinc** is heated with sulphur.

.....

- (ii) Some fossil fuels contain sulphur.
When fuels burn, sulphur reacts with oxygen.

Complete the word equation for this reaction.

sulphur + oxygen →

2 marks
maximum 6 marks

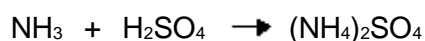
Q4.

The names and formulae of five compounds are listed in the table below.

name of compound	formula of compound
ammonia	NH ₃
ammonium chloride	NH ₄ Cl
ammonium sulphate	(NH ₄) ₂ SO ₄
sodium hydroxide	NaOH
sodium sulphate	Na ₂ SO ₄

- (a) Ammonia and sulphuric acid react to give ammonium sulphate, (NH₄)₂SO₄.

- (i) Balance the equation for this reaction.



1 mark

- (ii) Complete and balance the symbol equation for the reaction between sodium hydroxide and sulphuric acid.



3 marks

- (b) The formula for ammonia is NH_3 .
One atom of nitrogen weighs fourteen times as much as one atom of hydrogen.
What is the total mass of hydrogen in 17 g of ammonia?

..... g

1 mark

Maximum 5 marks

Q5.

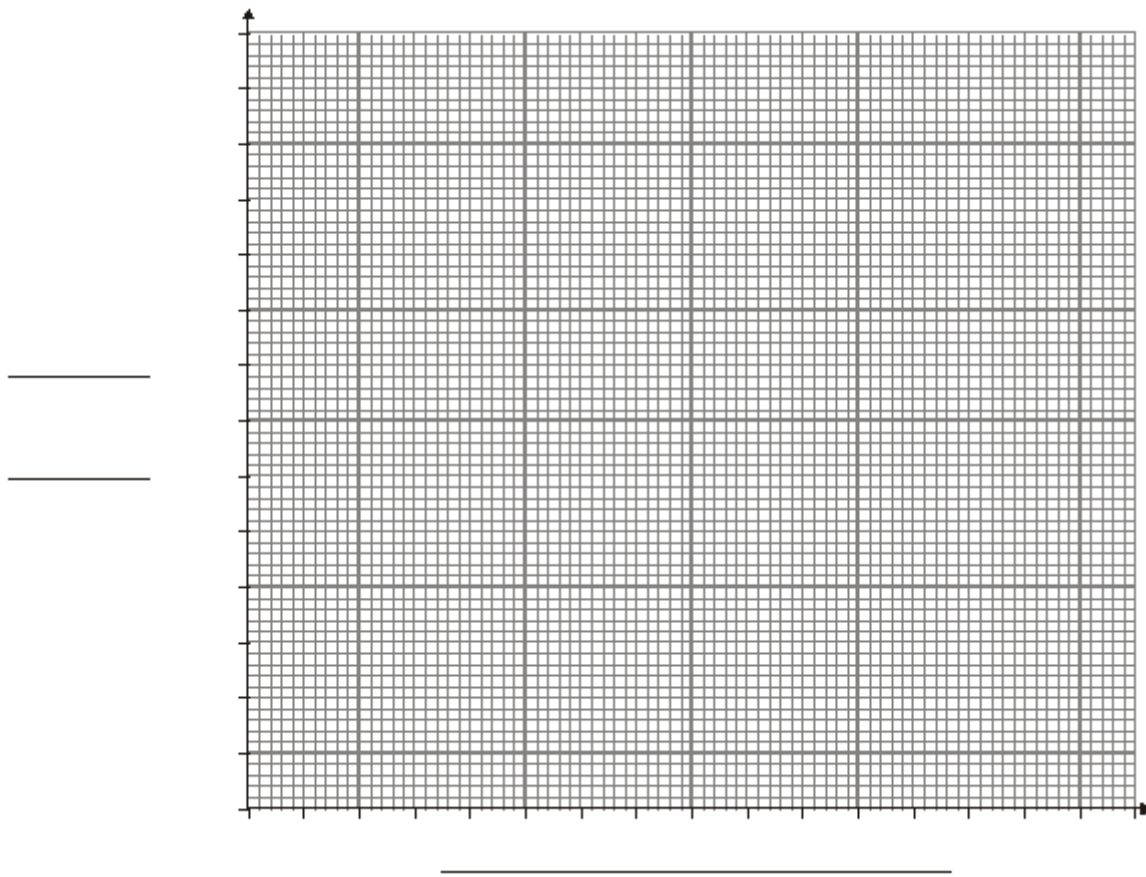
Six groups of pupils burned magnesium in air. The magnesium reacted with oxygen to form magnesium oxide.

They recorded the mass of magnesium used and the mass of magnesium oxide formed. Their results are shown in the table.

group	mass of magnesium (g)	mass of magnesium oxide (g)
A	3.2	5.2
B	3.8	6.5
C	4.2	7.0
D	4.9	8.6
E	5.4	8.0
F	6.1	10.7

- (a) Use their results to draw a graph below.

- Decide the scale for each axis.
- Label the axes.
- Plot the points.
- Draw a line of best fit.



4 marks

- (b) (i) Which group's results do **not** fit the general pattern?
Give the letter.

1 mark

- (ii) How should the class deal with this 'odd' result?

.....
.....

1 mark

- (c) Use the graph to predict the mass of magnesium oxide that will be formed by burning 7.0 g of magnesium.

..... 9

1 mark

- (d) The results show the relationship between the mass of magnesium and the mass of magnesium oxide formed.

What conclusion could you draw about this relationship?

.....
.....
.....
.....

1 mark

Q6.

A section of the periodic table of elements is shown below.

							H
							He
Li	Be	B	C	N	O	F	Ne
Na	Mg	Al	Si	P	S	Cl	Ar

(a) Where in this section of the periodic table are the metals found?

.....

1 mark

(b) Sodium chloride is formed when sodium and chlorine combine together in a chemical reaction.

Write the symbols for sodium and chlorine.

sodium

chlorine

2 marks

(c) The formula for a substance is MgS. What is the name of this substance?

.....

1 mark

(d) Give the name of one element in the table above which is a gas at room temperature and in which the atoms are joined together in molecules.

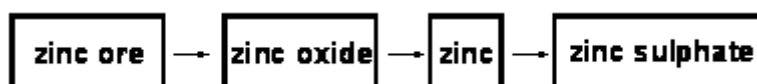
.....

1 mark

Maximum 5 marks

Q7.

The flow chart shows how zinc sulphate can be obtained.



(a) In the reaction **zinc oxide** → **zinc** an element is removed from zinc oxide to leave zinc. Give the name of the element.

.....

1 mark

- (b) (i) Zinc sulphate can be made in a reaction between zinc and an acid. Give the name of the acid.

.....

1 mark

- (ii) In the reaction between zinc and the acid, hydrogen is formed. Describe the test for hydrogen and the result if hydrogen is present.

.....

.....

1 mark

- (iii) How can crystals of zinc sulphate be formed from a dilute solution of zinc sulphate?

.....

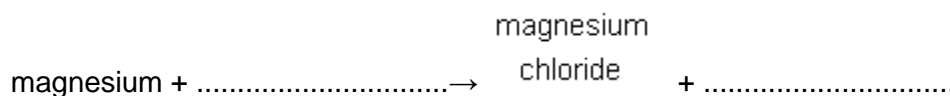
1 mark

Maximum 4 marks

Q8.

- (a) Magnesium chloride is formed when magnesium reacts with an acid.

- (i) Complete the word equation for the reaction between magnesium and this acid.



2 marks

- (ii) Suggest why magnesium chloride can be made by mixing magnesium with this acid but copper chloride **cannot** be made by mixing copper with this acid.

.....

.....

1 mark

- (b) Copper sulphate is made by adding copper oxide to a different acid. Give the name of the acid which is used.

.....

1 mark

- (c) In the table below, write the name of the compound represented by each formula.

formula	name
CuSO ₄	
MgCl ₂	

2 marks

Maximum 6 marks

