Name:
Science Class:
Teacher:
Hand in day:

Y7 Science
Term 2 Homework Booklet
Chemistry

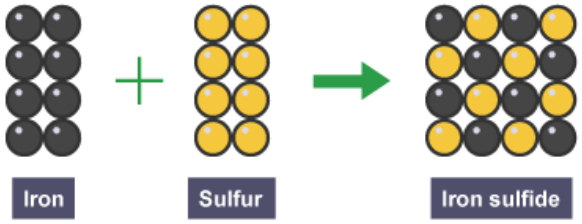
	Hand in Date	Parents Signature
Elements		
Homework 1		
Homework 2		
Homework 3		
Homework 4		
Homework 5		

Elements Homework 1:

Comprehension Task

A compound contains atoms of different elements, chemically joined together. Compounds are formed in chemical reactions, and you need other chemical reactions to separate a compound back into its elements. Mixtures are easily separated though. A mixture of iron and sulfur can easily be separated using a magnet. Iron is magnetic, sulfur is not.

The diagrams show what happens when iron filings and sulfur powder react together in a chemical reaction, rather than just mix together.

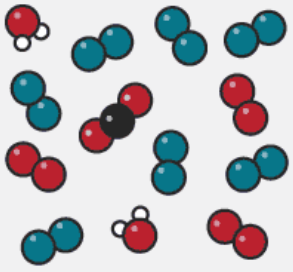


Mixtures have different properties from compounds. The table summarises these differences:

	Mixture	Compound
Composition	Variable composition – you can vary the amount of each substance in a mixture	Definite composition – you cannot vary the amount of each element in a compound
Joined or not	The different substances are not chemically joined together	The different elements are chemically joined together
Properties	Each substance in the mixture keeps its own properties	The compound has properties different from the elements it contains
Separation	Each substance is easily separated from the mixture	It can only be separated into its elements using chemical reactions
Examples	Air, sea water, most rocks	Water, carbon dioxide, magnesium oxide, sodium chloride

Important Definitions

- **an element contains just one type of atom**
- **a compound contains two or more different types of atom joined together**
- **a mixture contains two or more different substances that are not joined together**

Description	Example	Diagram
Pure element	Oxygen	
Pure compound	Carbon dioxide	
Mixture of elements and compounds	Air	

Questions

1. What is the definition of a compound?

2. How are compounds formed?

3. Iron and sulfur are elements. What is the definition of an element?

4. How could a mixture of iron and sulfur be separated?

5. What is the definition of a mixture?

6. What is the name of the compound formed when iron reacts with sulfur?

7. Give two examples of elements

8. Give two examples of mixtures

9. Give two examples of compounds

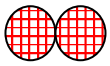
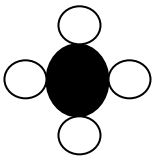
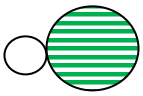
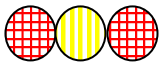
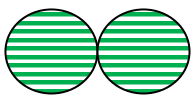
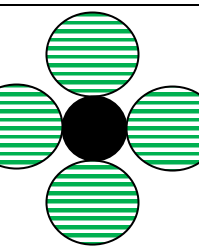
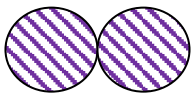
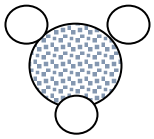
10. How can a compound be separated into the elements that made it?

Elements Homework 2:

Each coloured or patterned circle represents an atom of an element. A different colour or pattern means it is a different element. Each diagram represents either an **element or a compound**.

If the atoms are the same type, it is an **element**. If the atoms are different types, it is a **compound**.

Complete the table below

diagram	Element or compound
	Element (all the atoms are the same type)
	
	
	
	
	
	
	
	
	
	

Elements Homework 3:

Each different element has a different symbol. Each symbol must have a CAPITAL LETTER.
If there are two or more different elements (capital letters) present, it must be a compound.

Eg 1. N_2 shows that there is only 1 element (1 capital letter, N), but there are 2 atoms in total. This is an element as all the atoms are the same type (nitrogen)

Eg2. SO_2 shows that there are 2 elements (capital S and capital O), but there are 3 atoms in total (1 sulfur and 2 oxygen atoms). This is a compound as there are two or more different atoms joined together (sulfur and oxygen)

Complete the table below

Name of substance	Formula	Number of different elements	Total number of atoms	Element or compound?
oxygen	O_2	1		
carbon dioxide	CO_2		3	
sulfur	S_8		8	
nitric acid	HNO_3	3		
bromine	Br_2			element
sulfuric acid	H_2SO_4		7	
magnesium carbonate	$MgCO_3$			compound

Learn the following common elements and their symbols

Non-metal Gases:	Non-metal solids	Metal solids
hydrogen (**H_2**)	carbon (**C**)	sodium (**Na**),
oxygen (**O_2**)	sulfur (**S**)	potassium (**K**)
nitrogen (**N_2**)	iodine (**I_2**)	magnesium (**Mg**)
chlorine (**Cl_2**)		aluminium (**Al**)
		iron (**Fe**)
		copper (**Cu**)
		zinc (**Zn**)

bromine (**Br_2**) is a non-metal liquid

Elements Homework 4:

(a) The table below shows information about five elements.

element	melting point (°C)	boiling point (°C)	conducts electricity	colour
A	–7	59	no	brown
B	–218	–183	no	colourless
C	1535	2750	yes	silvery
D	113	445	no	yellow
E	1083	2567	yes	orange

(i) Which **two** of these elements are likely to be metals?

Write the letters.

..... and .....

1 mark

(ii) Which element in the table is liquid at room temperature?
Write the letter.

.....

1 mark

(b) What is the chemical symbol for copper?
Tick the correct box.

Cr ☐ Cu ☐ C ☐ Co ☐ Ca ☐

1 mark

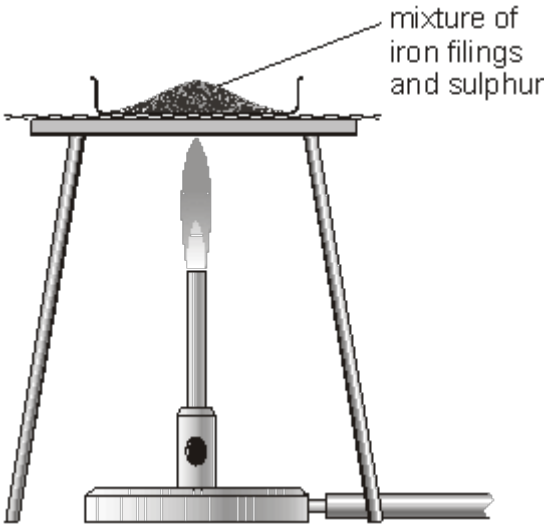
(c) How many atoms of iron and oxygen are there shown in the formulas for FeO and Fe_2O_3?

Complete the table below.

compound	number of atoms of iron	number of atoms of oxygen
FeO		
Fe_2O_3		

2 marks
maximum 5 marks

A teacher mixed iron filings with sulfur on a metal tray.
She heated the mixture in a fume cupboard.
Sulfur 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 sulfide was left.

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

.....

.....

1 mark

(e) What type of substance is each of the chemicals involved in this reaction?

Choose from:

metallic element	**mixture**	**non-metallic element**	**compound**

iron .....

sulfur .....

iron sulfide .....

2 marks

(f) 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?
sulfur	
iron	
iron sulfide	no

1 mark

(g) (i) When iron is heated with sulfur, iron sulfide is formed.

Give the name of the solid formed when **zinc** is heated with sulfur.

.....

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

Complete the word equation for this reaction.

sulfur + oxygen → .....

2 marks
maximum 6 marks

Learn the names of the following compounds and be able to recognise them from their chemical formula…

Gases:	Solids (simple):	Solids (complex):
Hydrogen Chloride (HCl)	Sodium Chloride (NaCl)	Sodium Carbonate (Na_2CO_3)
Carbon Dioxide (CO_2)	Magnesium Chloride ($MgCl_2$)	Potassium Nitrate (KNO_3)
Sulfur Dioxide (SO_2)	Copper Bromide ($CuBr_2$)	Magnesium Sulfate ($MgSO_4$)
	Zinc Iodide (ZnI_2)	Sodium Hydroxide (NaOH)

Elements Homework 5:

(a) This question is about gases.

Draw **one** line from each substance to the description of the substance.

Substance	Description of substance
	Compound
Air	Element
Carbon dioxide	Hydrocarbon
Oxygen	Metal
	Mixture

(3)

(b) What is used to test for each of the gases?

Draw **one** line from each substance to the description of the substance.

Gas	Test
	A glowing splint
Carbon dioxide	A lighted splint
Oxygen	Limewater
	Litmus paper

(2)

Bleach is a solution of sodium hypochlorite (NaClO).

Chlorine gas is produced when bleach reacts with hydrochloric acid.

$$NaClO(aq) + 2HCl\ (aq) \rightleftharpoons NaCl(aq) + H_2O(l) + Cl_2(g)$$

(c) What is the test for chlorine gas?

Tick **one** box.

A glowing splint relights ☐

A lighted splint gives a pop ☐

Damp litmus paper turns white ☐

Limewater turns milky ☐

(1)

Hydrogen is a flammable gas

(d) Give the expected result when a test tube of hydrogen gas is burned with a lit splint.

_____

_____

(1)

This question is about chemicals in fireworks.

Coloured flames are produced because of the metals in the fireworks.

(e) What colour flame would potassium produce?

_____

(1)

(f) Name a metal that would produce a green flame.

_____

(1)

(g) Some fireworks contain a mixture of metal ions.

Why is it difficult to identify the metals in the mixture from the colour of the flame?

_____

_____

(1)

(Total 10 marks)