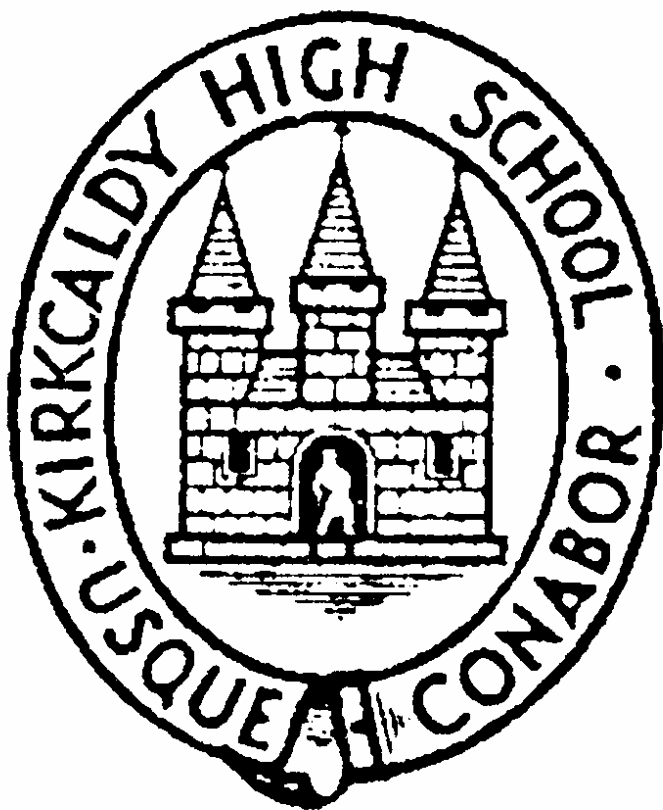


3rd Year Chemistry

Homework Booklet



Kirkcaldy High School

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Introduction

Date Due _____

Discoveries in Chemistry

1. Make a poster three important discoveries in Chemistry that have happened in the last 6 months...

- **What was each discovery?**
- **Who made each discovery?**
- **Where were these discoveries made?**
- **Why is each discovery important?**
- **What effect might each discovery have on our lives?**

Make it bright, bold and colourful!

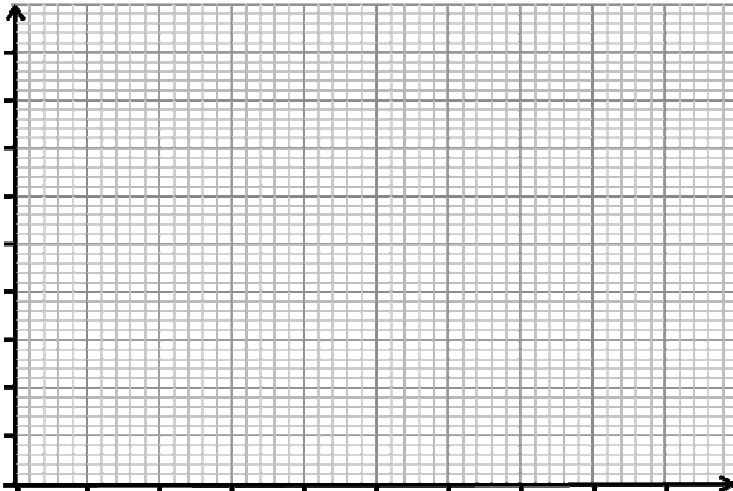
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Dr. Murray's Boiled Eggs

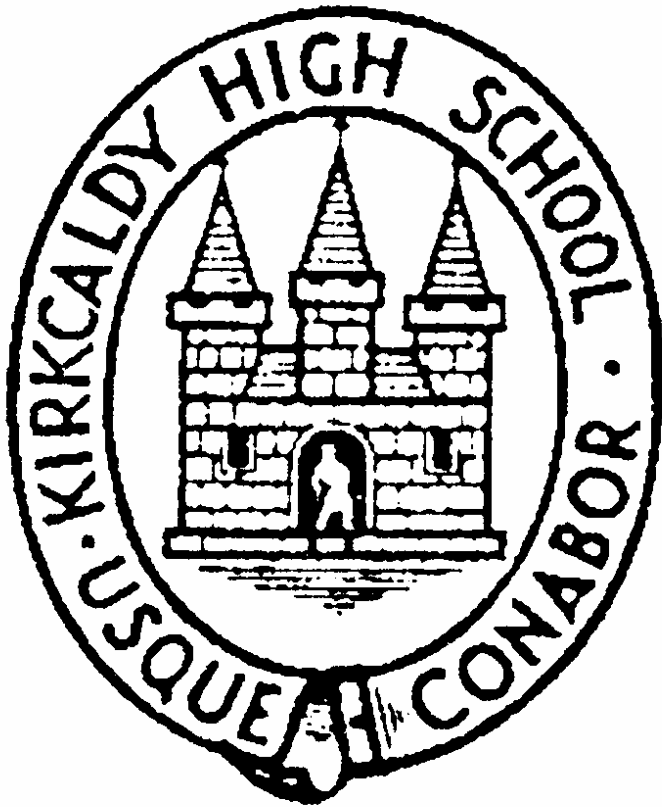
Over the last few weeks Dr. Murray has been trying to find the perfect boiling time for eggs. His data is in the table below.

Width of Egg /mm	Perfect boiling time /s
15	63
20	84
25	105
30	126
35	147
40	168
45	189

- Plot Dr. Murray's data as a graph. Graph paper is below.
- Dr. Murray has now bought a box of eggs that have a width of 17 mm. How long should he boil them for?



Unit 1



Chemical Changes and Structure

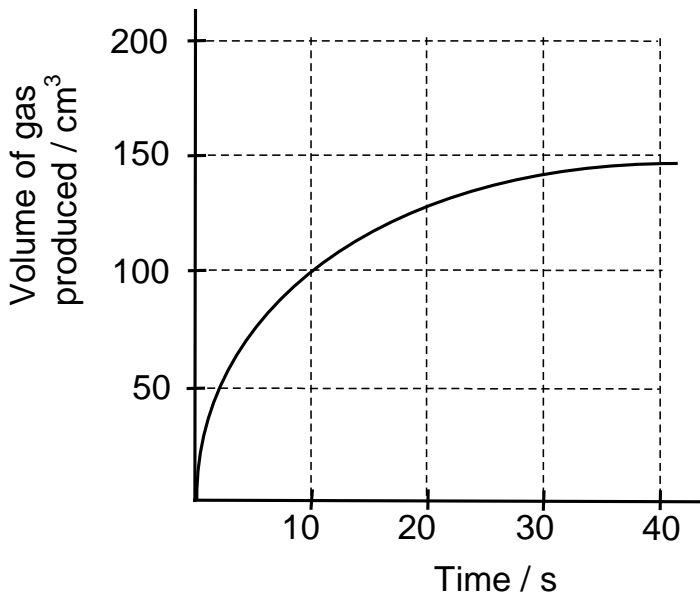
Rates of Reaction

Date Due _____

Concentration, Temperature and Calculating Rates

1. Why does increasing the concentration increase the rate of a chemical reaction?

2. Why does increasing the temperature increase the rate of a chemical reaction?



3. The graph above shows the gas produced during the first 40 s of a chemical reaction. Calculate the rate

a) Between 0 s and 10 s

b) Between 10 s and 20 s

c) Between 20 and 40 s

Date Due _____

Catalysts and Particle Size

1. What is a catalyst?

2. Give three examples of catalysts used in everyday life (Maybe Google is your friend here!).

3. Why does decreasing particle size increase the rate of a chemical reaction?

4. What is an enzyme?

Atomic Structure and Bonding Related to Properties of Materials

Date Due _____

Elements and compounds

1. Write down the names of three elements which...

a) Have a different symbol to their name.

b) Are made by scientists.

c) Were discovered by French scientists.

d) Are named after a place.

2. What is the difference between atomic number and mass number (relative atomic mass) for an element?

3. What is the difference between an element and a compound?

4. What elements are contained in the following compounds?

Sodium chloride: _____

Potassium nitride: _____

Potassium nitrate: _____

Copper carbonate: _____

Magnesium sulphate: _____

Electrolysis, coloured ions and structures.

1. Complete the table of an electrolysis .

Compound	Positive ion & colour	Negative ion & colour	Colour at positive electrode	Colour at negative electrode
$\text{Cu}(\text{CrO}_4)_2$	Cu^{2+} blue	CrO_4^- yellow	Yellow	Blue
KMnO_4	K^+ colourless	MnO_4^- purple		
NiCl_2	Ni^{2+} green	Cl^- colourless		
$\text{Co}(\text{MnO}_4)_2$	Co^{2+} red	MnO_4^- purple		
$\text{Na}(\text{Cr}_2\text{O}_7)_2$	Na^+ colourless	Cr_2O_7^- orange		
Cu	Cu^{2+} blue	Br colourless		
$\text{Mn}(\text{CrO}_4)_2$	Mn^{2+} Pale pink	CrO_4^- yellow		

2. What is the difference between a covalent network and a covalent molecule?

3. Complete these sentences.

I would expect Sodium _____ to dissolve in water because _____ chloride is ionic and most ionic _____ dissolve in water.

I would _____ carbon dioxide not to dissolve _____ water because carbon dioxide is _____ and most covalent compounds _____ in water.

4. What do you think are the three most important things that you've learnt in Chemistry so far? Why?

Formulae and Reaction Quantities

Date Due _____

Chemical Formulae

1. Complete the table for these compounds using prefix rules.

Name	Formula
Sulphur tetrafluoride	SF ₄
Dihydrogen oxide	
Platinum dichloride	
Tungsten hexachloride	
Dinitrogen pentoxide	
Boron trihydride	
Diboron hexahydride	
	FeCl ₆
	AgCl ₂
	P ₂ S ₃
	NI ₃
	CCl ₄
	NO
	B ₁₀ H ₁₄ ☺

2. Complete the table for these compounds using valency rules.

Name	Formula
Sulphur hydride	SH ₂
Potassium chloride	
Magnesium sulphide	
Carbon chloride	
Platinum(II) chloride	
Iron (II) oxide	
Nitrogen oxide	
Potassium nitrate	
Magnesium sulphate	
Calcium iodide	
Sodium carbonate	
Rubidium hydroxide	
Ruthenium(III) nitrate	
Ammonium chloride	

Date Due _____

Chemical Formulae 2

1. Work out the chemical names...

Remember for chemical names with prefixes (di, tri etc.) you can just write them straight down. For others you'll need the valency-cross-over method!

Name	Formula
Phosphorus pentafluoride	PF ₅
Calcium hydride	CaH ₂
Sodium Bromide	
Magnesium Bromide	
Silicon Oxide	
Silicon fluoride	
Barium nitride	
Gallium Arsenide	
Strontium Selenide	
Dinitrogen tetroxide	

2. Work out the chemical names...

Remember, the Roman Numeral in brackets is the valency of the element before it!

Name	Formula
Iron(III) Oxide	Fe_2O_3
Copper(II) Chloride	CuCl_2
Manganese(II) Fluoride	
Palladium(II) phosphide	
Nitrogen triiodide	
Xenon hexafluoride	
Manganese(VII) Oxide	
Osmium tetroxide	
Cobalt(II) Chloride	
Hydrogen Oxide	
Carbon hydride	
Zinc(II) Bromide	
Silver(I) Oxide	
Pentaboron undecahydride	

Equations.

1. Write and symbol word equation for each of these. Use a separate sheet if you need more space!

“Cars are fitted with catalytic convertors that convert harmful gases to carbon dioxide and nitrogen. Carbon monoxide reacts with nitrogen dioxide on the catalyst surface. “

Word:

Symbol

Plants are able to make glucose ($C_6H_{12}O_6$) from carbon dioxide gas in a reaction called photosynthesis. The other reactant is water, taken in through the roots. Oxygen gas is also formed in the process. Energy from the Sun is required for the reaction.

Word:

Symbol

2. Write and symbol word equation for each of these.

Use a separate sheet if you need more space!

“Magnesium burns in carbon dioxide gas. A black solid (carbon) and a white powder (magnesium oxide) are formed. “

Word:

Symbol

“In a car engine, petrol (C_8H_{18}) reacts with the oxygen of the air. Carbon dioxide and water are released into the air from the car exhaust system.”

Word:

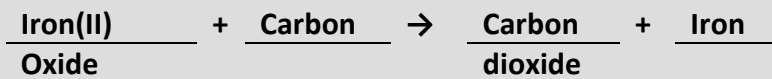
Symbol

Chemical Equations

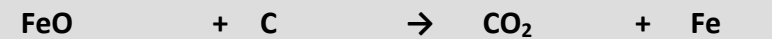
1. Complete the following word and formula equations. The first one has been done for you! You'll have to work out some of the formula using the valency-cross-over method. Remember, some elements are diatomic...

Iron(II) oxide reacts with carbon to produce iron and carbon dioxide.

Word:

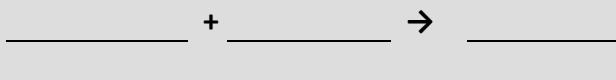


Formula:

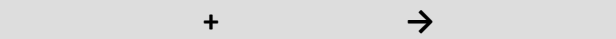


Magnesium reacts with chlorine to produce magnesium chloride.

Word:



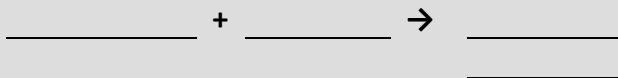
Formula:



2. Complete the following word and formula equations.

Nitrogen reacts with hydrogen to produce nitrogen hydride.

Word:

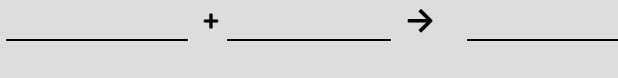


Formula:

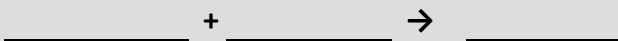


Nitrogen hydride reacts with iodine to produce nitrogen iodide.

Word:

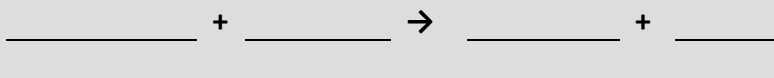


Formula:



Caesium reacts with water to produce caesium hydroxide and hydrogen.

Word:



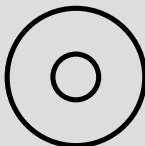
Formula:



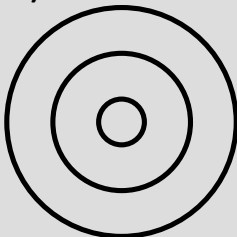
Date Due _____

Electron Arrangements and Relative Atomic Masses

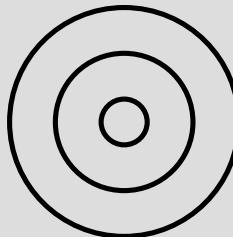
1. Complete the diagrams below showing electron arrangements (E.A.).



Beryllium
E.A 2,7



Sodium
E.A 2,8,1



Chlorine
E.A 2,8,7

2. How many protons, neutrons and electrons are in ${}^6_{12}\text{C}$

3. Why is the relative atomic mass of chlorine 35.5 amu and not 35 amu or 37 amu?

**4. Calculate the gram formula mass.
Magnesium Chloride (MgCl_2)**

Iron(III) Chloride (FeCl_3)

Magnesium phosphide (Mg_3P_2)

Magnesium phosphate ($\text{Mg}_3(\text{PO}_4)_2$)

Date Due _____

Gram formula masses

1. Work out the Gramn Formula Mass

You will want to use p7 of the data booklet!

http://www.sqa.org.uk/files_ccc/ChemistryDataBookletSQPN5.pdf

Name	Formula	GFM
Phosphorus pentafluoride	PF ₅	31 x 1+ 19 x 5 =126 g
Calcium hydride	CaH ₂	
Sodium Bromide	NaBr	
Magnesium Bromide	MgBr ₂	
Silicon Oxide	Na ₂ O	
Silicon fluoride	NaF	

2. Work out the Gramm Formula Mass

You will want to use p7 of the data booklet!

http://www.sqa.org.uk/files_ccc/ChemistryDataBookletSQPN5.pdf

Name	Formula	GFM
Iron(III) Oxide	Fe_2O_3	56×2 16×3 $=160 \text{ g}$
Copper(II) Chloride	CuCl_2	
Manganese(II) Fluoride	MgF_2	
Palladium(II) phosphide	Pd_3P_2	
Nitrogen triiodide	NI_3	
Xenon hexafluoride	XeF_6	
Manganese(VII) Oxide	Mn_2O_7	
Osmium tetroxide	OsO_4	

Date Due _____

Moles to Mass

1. Use $m = n \times \text{GFM}$ to work out the mass of...

1 mole of H_2 (GFM = 2 g)

3 moles of NH_3 (GFM = 17 g)

0.34 moles of CH_4 (GFM = 16 g)

1.8 moles of $\text{C}_2\text{H}_6\text{O}$ (GFM = 34 g)

104 moles of $\text{C}_6\text{H}_9\text{N}_3\text{O}_2$ (GFM = 155 g)

2. Use $n = \frac{m}{\text{GFM}}$ to work out the number of moles in...

2 g of H_2 (GFM = 2 g)

140 g of NH_3 (GFM = 17 g)

0.5 g of CH_4 (GFM = 16 g)

1.4 g of $\text{C}_2\text{H}_6\text{O}$ (GFM = 34 g)

40 g of $\text{C}_6\text{H}_9\text{N}_3\text{O}_2$ (GFM = 155 g)

Date Due _____

Nuclide Notation, formulae and conduction.

1. Complete the table.

Element	Atomic number	Mass number	Number of protons	Number of neutrons	Number of electrons
${}_{5}^{11}\text{B}^{3-}$					8
${}_{12}^{26}\text{Mg}^{2+}$					
${}_{14}^{28}\text{Si}^{4-}$					
	34	74			36
	17			18	18
	84	209			86
	38	87			37

2. How do we know that ${}_{25}^{54}\text{Mn}^{7+}$ has 25 protons, 29 neutrons and 18 electrons?

3. Carbon dioxide (CO_2) is a covalent molecular compound. Lithium chloride (LiCl) is an ionic network. What do the formulae of carbon dioxide and Lithium Chloride mean?

3. Why do ionic compounds only conduct electricity as liquids and solutions and covalent compound don't conduct electricity at all?

Date Due _____

Ionic Formulae

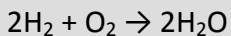
1. Complete the table for these compounds with ionic formulae.

Name	Ionic Formula
Magnesium Chloride	$\text{Mg}^{2+} \text{Cl}_2^{-}$
Sodium Chloride	
Calcium bromide	
Barium sulphide	
Aluminium chloride	
Potassium carbide	
Tin nitride	
Lead oxide	
Bismuth selenide	
Iron(II) sulphide	

2. Complete the table for these compounds with ionic formulae.

Name	Ionic Formula
Magnesium sulphate	$\text{Mg}^{2+} \text{SO}_4^{2-}$
Sodium nitrate	
Calcium carbonate	
Barium sulphate	
Aluminium Nitrate	
Potassium carbonate	
Tin nitrate	
Lead hydroxide	
Bismuth sulphate	
Iron(II) sulphate	

Quantities from Equations

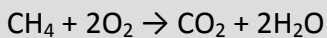


1. From the equation above...

a. Use $n = \frac{m}{\text{GFM}}$ to work out the number of moles in 30 g of hydrogen gas.

b. How do we know that the number of moles of water produced from burning 30 g of hydrogen gas will be the same as the answer to (a)?

c. Use $m = n \times \text{GFM}$ to work out the mass of water produced from burning 30 g of hydrogen gas.



2. From the equation above...

a. Use $n = \frac{m}{\text{GFM}}$ to work out the number of moles in 100 g of methane (CH_4) gas.

b. How do we know that the number of moles of water produced from burning 100 g of methane gas will be the twice the answer to (a)?

c. Use $m = n \times \text{GFM}$ to work out the mass of water produced from burning 100 g of methane gas.

Acids and Bases

Date Due _____

Acids and Bases

1. What is a base?

2. How can we tell the difference between acids and alkalis?

3. What happens to the pH of an acidic or alkaline solution as it is diluted?

4. How do we know that a solution of CO_2 will be acidic and a solution of MgO will be alkaline?

5. Name the salts of...

Sodium hydroxide and hydrochloric acid

Magnesium hydroxide and nitric acid

Lithium hydroxide and sulphuric acid

Date Due _____

Reactions of Acids

1. Write a word equation to describe the reactants and products when an acid reacts with (the first one has been done for you!)....

A metal

Metal + Acid → Salt + Hydrogen

A metal oxide

A metal carbonate

A metal hydroxide

2. Write *balanced* word and formula equations to describe the following reactions

Magnesium reacting with hydrochloric acid

Word:

Magnesium + Hydrochloric → Magnesium + Hydr
Acid Chloride

Formula:

Mg + 2HCl → MgCl₂ + H₂

Sodium reacting with hydrochloric acid

Word:

Formula:

Sodium oxide reacting with sulphuric acid

Word:

Formula:

Iron(II) hydroxide reacting with Sulphuric acid

Word:

Formula:

Solution Calculations

- 1. Calculate the number of moles for a solution of concentration 0.1 mol l^{-1} and volume 30 cm^3 .**
- 2. 3 moles of a substance is dissolved in 50 cm^3 of water. What is the concentration of the solution?**
- 4. A solution of concentration 5 mol l^{-1} has 0.2 moles of a substance dissolved in it. What is the volume of the solution?**
- 5. Calculate the concentration of a solution which has a volume of 2000 cm^3 where 3.2 moles of a substance has been dissolved in water.**

6. Which has the greater concentration, a solution of 5 moles dissolved in 600 cm^3 of water or a solution of 6 moles dissolved in 700 cm^3 of water (hint – use $C = \frac{n}{V}$ for each solution and compare the answers)?

7. Which contains the greater number of moles, 40 cm^3 of a 0.3 mol l^{-1} solution or 2 litres of a 0.003 mol l^{-1} solution (hint – use $n = CV$ for each solution and compare the answers)?

2. 60 cm^3 of 0.5 mol l^{-1} magnesium hydroxide (Mg(OH)_2) neutralises 0.3 mol l^{-1} hydrochloric acid. What volume of hydrochloric acid is neutralised?

3. 80 cm^3 of calcium hydroxide (Ca(OH)_2) is neutralised by 40 cm^3 of 0.4 mol l^{-1} nitric acid (HNO_3). What is the concentration of the calcium hydroxide

Date Due _____

Titrations

For any titration experiment, you can use the formula:

$$\frac{C_1V_1}{n_1} = \frac{C_2V_2}{n_2}$$

- Where “1” and “2” refer to the acid and alkali
- C is concentration (in moles per litre, mol l⁻¹)
- V is volume (in litres, l)
- N is the number of H (acid) or OH (alkali) in the formula
- Remember to convert cm³ to litres....

1. 50 cm³ of 0.1 mol l⁻¹ sodium hydroxide (NaOH) neutralises 100 cm³ of hydrochloric acid. What is the concentration of the hydrochloric acid?

2. 60 cm^3 of 0.5 mol l^{-1} magnesium hydroxide ($\text{Mg}(\text{OH})_2$) neutralises 0.3 mol l^{-1} hydrochloric acid. What volume of hydrochloric acid is neutralised?

3. 80 cm^3 of calcium hydroxide ($\text{Ca}(\text{OH})_2$) is neutralised by 40 cm^3 of 0.4 mol l^{-1} nitric acid (HNO_3). What is the concentration of the calcium hydroxide

Titrations 2

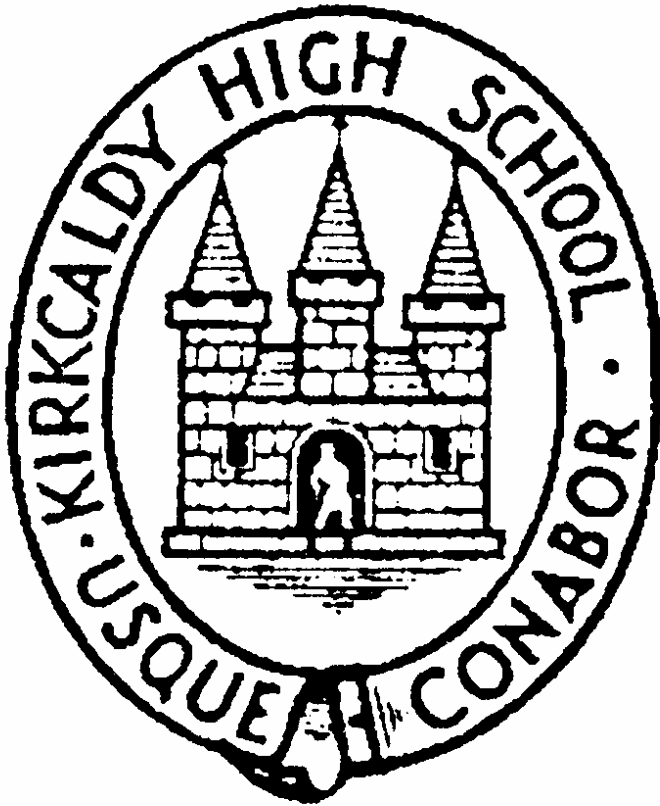
1. 23 cm^3 of potassium hydroxide (0.1 mol l^{-1}) is neutralised by 30 cm^3 sulphuric acid. What is the concentration of the sulphuric acid?

2. Magnesium hydroxide (50 cm^3) is neutralised by hydrochloric acid (45 cm^3 , 4 mol l^{-1}). What is the concentration of the hydrochloric acid?

3. A neutralisation reaction takes place between 8 mol l^{-1} nitric acid and 6 l of 0.1 mol l^{-1} sodium hydroxide. What volume of nitric acid was used?

4. Hydrochloric acid (7.3 mol l^{-1}) was neutralised by 30 cm^3 lithium hydroxide until universal indicator turned green. The concentration of the lithium hydroxide was 0.2 mol l^{-1} . What volume of hydrochloric acid was used?

Unit 2



Nature's Chemistry

Fuels

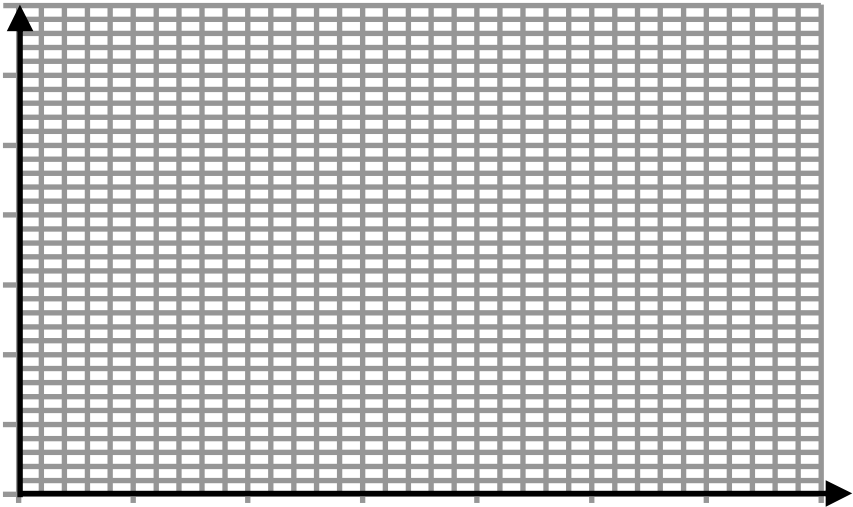
Date Due _____

Fuels 1

A burner full of fuel was used to heat up a beaker of water. The temperature was measure every 10 seconds. The results are shown in the table below.

Time (s)	Temperature (°C)
0	28
10	35
20	41
30	48
40	57
50	64
60	73
70	78
80	82
90	85
100	87
110	95
120	100
130	99
140	100

Use the graph paper on the next page to draw a line graph of these results.

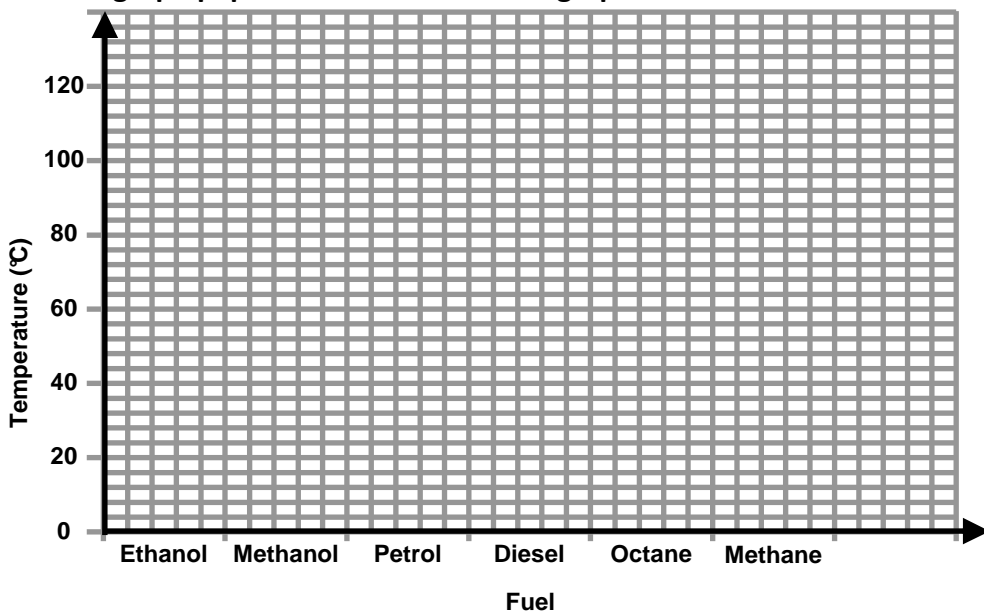


NB: Check your graph has axes, axis labels, units, scales, points and a “best fit” line!

Four fuels were used to heat up 4 beakers of water. They were allowed to heat for 2 minutes before a final temperature was measured in each beaker. The results are shown in the table below.

Fuel	Final Temperature (°C)
Ethanol	76
Methanol	45
Petrol	90
Diesel	50
Octane	85
Methane	70

Use the graph paper below to draw a bar graph of these results.



NB: Check your graph has axes, axis labels, units, a scale and bars.

Date Due _____

Fuels 2

1. What is a fuel?

2. What are the three main uses for fuels?

3. What is a fossil fuel?

4. What are the three fossil fuels?

5. How can we use fuels to make electricity?

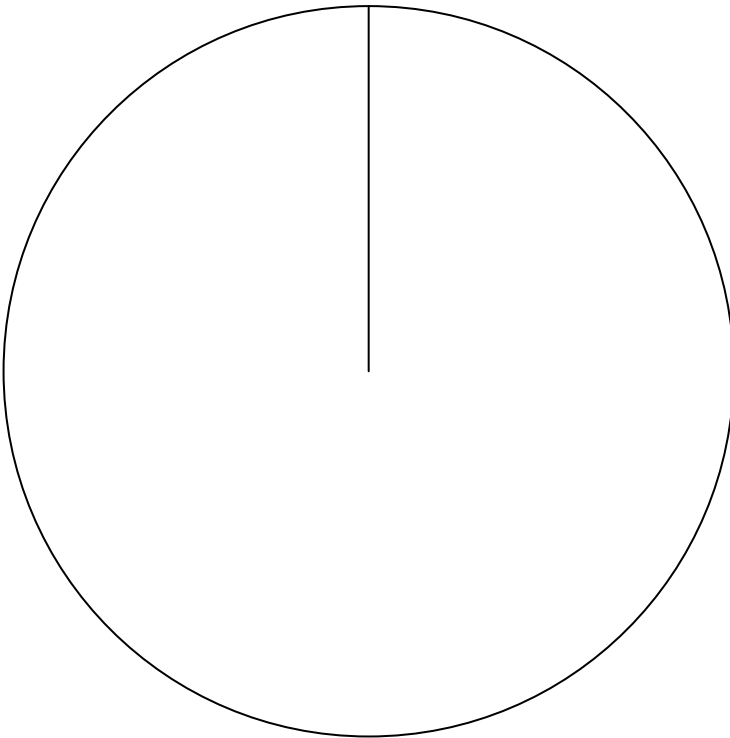
6. What are the four things that are needed for fossil fuels to form?

Date Due _____

Fractions of Crude Oil – Pie Chart

Use the data in the table to complete the pie chart for the uses of the fractions of crude oil

Use	% Required	No. of degrees of "segment" in pie chart
Tar	25	90
Aeroplane Fuel	20	72
Diesel	30	108
Petrol	20	72
Household Gas	5	18



Date Due _____

Pollution and Acid Rain

1. Write down three sources of air pollution.

2. What are the three gases that make up most air pollution?

3. What effect does acid rain have on seas, oceans, rivers and lakes?

4. Which gas is thought to be responsible for Global Warming?

5. Write down two effects of Global Warming.

6. Do you agree or disagree that Global Warming is happening? Why?

Global Warming



1. Which of the above statements (1 or 2) do you agree with most and why?

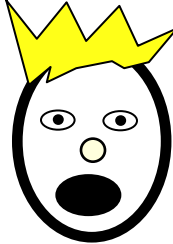
I think the greenhouse effect is caused by acid rain

1



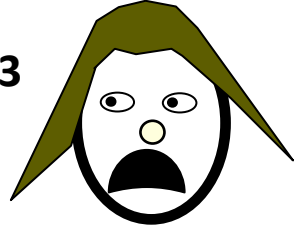
I think the greenhouse effect is caused by the hole in the ozone layer

2



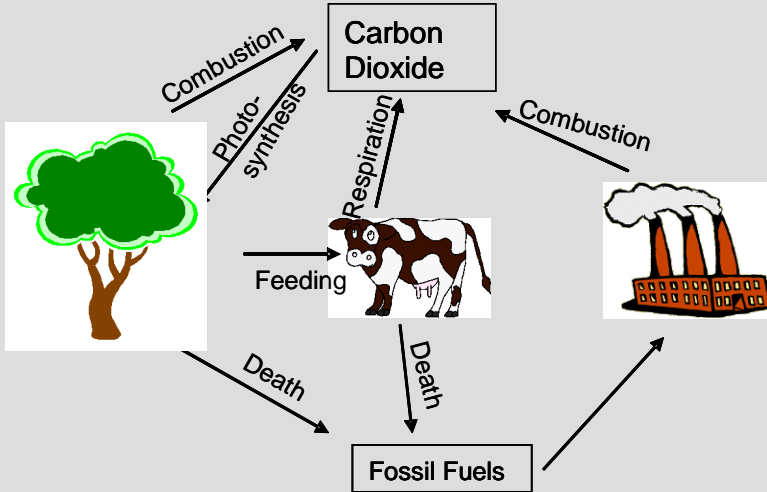
I think the greenhouse effect is caused by increased carbon in the atmosphere

3

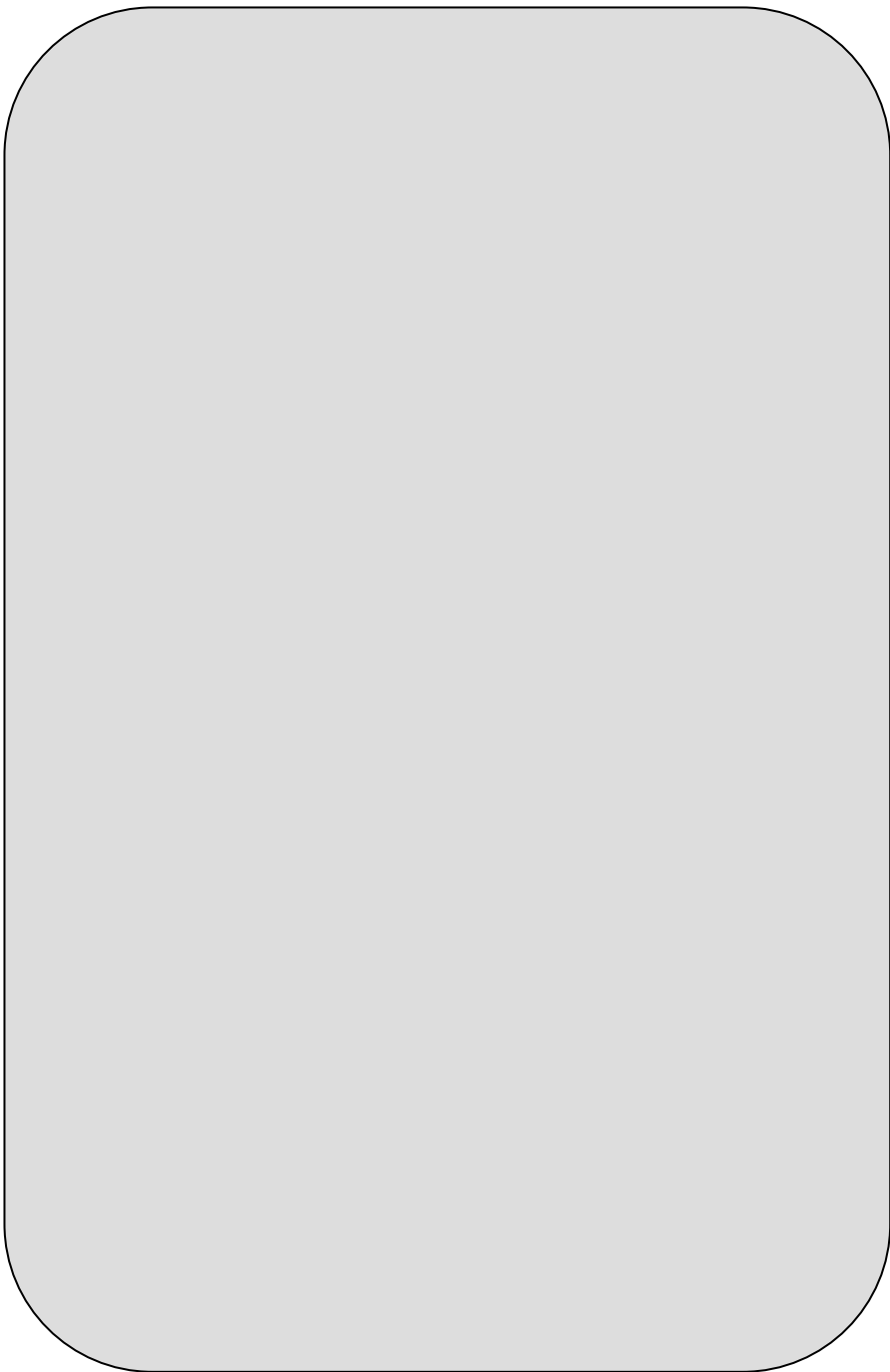


2. Which of the above statements (1, 2 or 3) do you agree most with and why?

Carbon Cycle



1. Use the carbon cycle above to write your story of “a day in the life of a carbon atom”. Use each of the words in the picture in your story. Use both sides of the sheet and extra paper if you want!



Date Due _____

Alternative Fuels

1. Complete the table. Use Google to look them up if you don't know about them!

Fuel	Where it comes from/how it's made
Ethanol (alcohol)	
Methanol	
Biodiesel	
Hydrogen	

2. Complete the table showing the advantages/disadvantages of these alternative power sources. Use Google to look them up if you don't know about them!

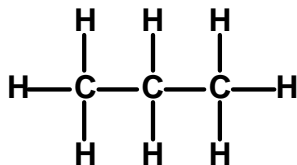
Power source	Advantages	Disadvantages
Solar Power		Expensive
Wind Power	Good for windy places	
Wave Power		Not good for inland locations
Geothermal Power		Not available everywhere
Hydro-electric Power	Good for rural areas with lost of water	

Homologous Series

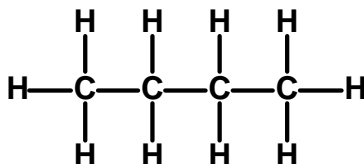
Date Due _____

Alkanes and Alkenes 1

Name	Number of carbons in the longest chain
Methane	1
Ethane	2
Propane	3
Butane	4
Pentane	5
Hexane	6
Heptane	7
Octane	8



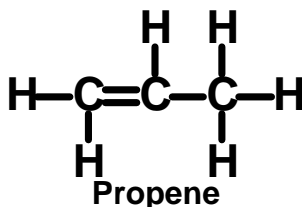
Propane



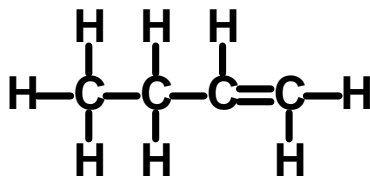
Butane

1. Draw the structures of hexane and pentane. Remember that each carbon must have 4 bonds and that a double bond counts as 2!

Name	Number of carbons in the longest chain
Methene	1
Ethene	2
Propene	3
Butene	4
Pentene	5
Hexene	6
Heptene	7
Octene	8



Propene



But-1-ene

2. Draw the structures of pent-1-ene and hept-2-ene. Remember that each carbon must have 4 bonds and that a double bond counts as 2!

Date Due _____

Alkanes and Alkenes 2

1. What is a hydrocarbon?

2. Complete the table...

Formula	Hydrocarbon?
C_2H_6	Yes
C_{60}	
$C_6H_{12}O_6$	
CH_5N	
H_2	
CH_4	

3. What information does a “full structural formula” tell us?

4. Complete the table (use a separate sheet if you need to!)

Name	Full structural formula	Shortened Structural formula
Propane	$\begin{array}{ccccc} & \text{H} & \text{H} & \text{H} & \\ & & & & \\ \text{H} & - \text{C} & - \text{C} & - \text{C} & - \text{H} \\ & & & & \\ & \text{H} & \text{H} & \text{H} & \end{array}$	$\text{CH}_3\text{CH}_2\text{CH}_3$
Ethane		
		CH_4
	$\begin{array}{ccccccc} & \text{H} & \text{H} & \text{H} & \text{H} & & \\ & & & & & & \\ \text{H} & - \text{C} & - \text{C} & - \text{C} & - \text{C} & - \text{H} & \\ & & & & & & \\ & \text{H} & \text{H} & \text{H} & \text{H} & & \end{array}$	
Pentane		

Date Due _____

Alkanes and Alkenes 3

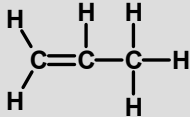
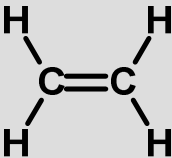
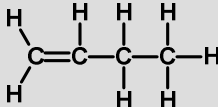
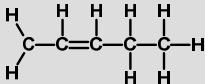
1. What is the difference between an alkane and an alkene?

2. Complete the table...

Hydrocarbon	Saturated or Unsaturated	General Formula
Alkane		
Alkene		
Cycloalkane		

3. How can we tell the difference between alkanes and alkenes?

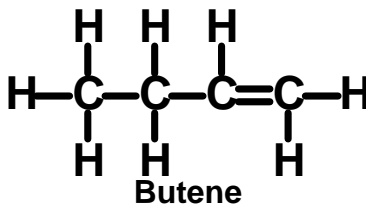
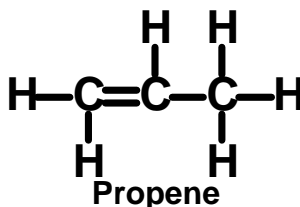
4. Complete the table (use a separate sheet if you need to!)

Name	Full structural formula	Shortened Structural formula
Propene		CH ₂ CHCH ₃
Ethene		
But-1-ene		
But-2-ene		CH ₃ CHCHCH ₃
Pent-2-ene		

Date Due _____

Alkenes and Bromine

Name	Number of carbons in the longest chain
Methane	1
Ethane	2
Propane	3
Butane	4
Pentane	5
Hexane	6
Heptane	7
Octane	8



1. Draw the products of the reaction of bromine with the two alkenes above. Remember that each carbon must have 4 bonds! What colour change would you expect to see during the reaction?

2. Which of the following is an equation for a possible cracking reaction (there's more than one!)?

Reaction	OK	Not OK
Octane → Butane + Butene		
Heptane → Hexene + Methane		
Propane → Ethane + Ethene		
Pentane → Propane + Ethene		
Octane → Heptane + Methane		
Propane → Methane + Ethene		
Pentane → Butene + Methane		

Everyday Consumer Products

Energy from Fuels

Date Due _____

Enthalpy of Combustion

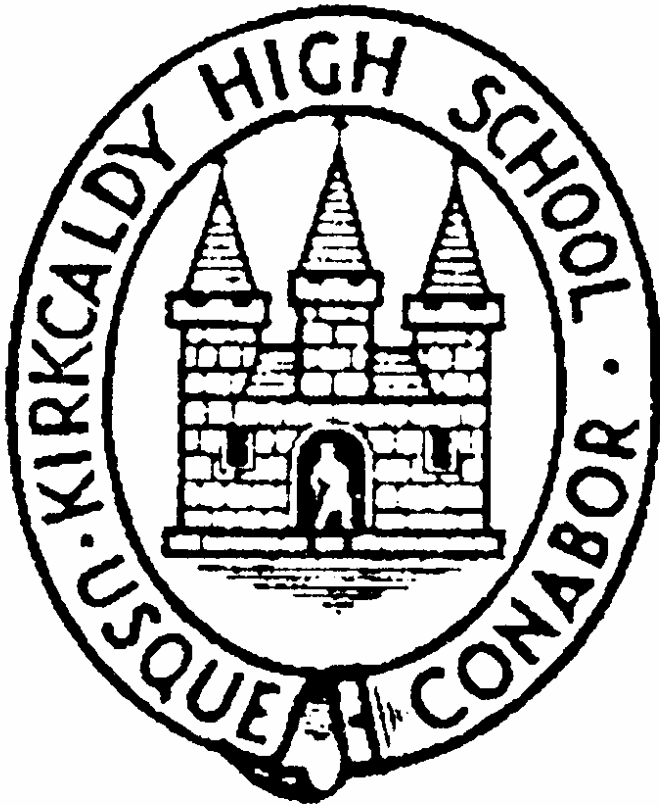
1. Methanol, is burned and the heat energy given out increased the temperature of 100g of water from 22 °C to 32 °C. Calculate the heat energy released in the experiment.

2. Methane was burned and the energy given out raised the temperature of 200 cm³ of water from 18 °C to 28.6 °C. Calculate the heat energy released in the experiment.

3 Ethanol, was burned and the heat given out raised the temperature of 500 cm³ of water by 3.5°C. Calculate the heat energy released in the experiment.

4. Ethane was burned and the heat given out used to raise the temperature of 100 cm³ of water by 21 °C. Calculate the heat energy released in the experiment.

Unit 3



Chemistry in Society

Metals

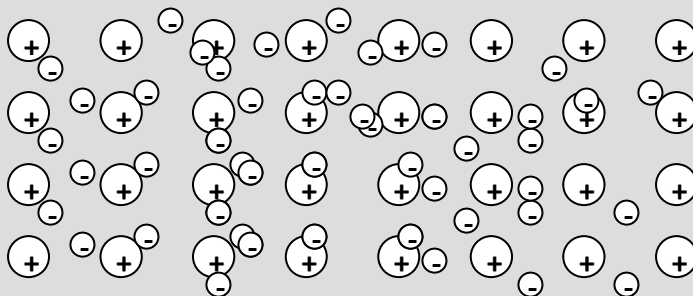
Date Due _____

Metals

1. Give a use for each of these metal elements

2. Why do we use gold for jewellery because and titanium for artificial legs instead of using gold for artificial legs and titanium for jewellery?

3. Label the diagram of the nuclei and electrons in a metal. With “positive nuclei” and “sea of electrons”



4. Why do metals conduct electricity?

Date Due _____

Metals 2

1. Complete the table...

Metal Use	Important Property
Bridges	Strong
Cooking pans	
Electrical wires	
Bikes	
Planes	
Radiation Shielding	

2. What is the chemical formula for sodium oxide (hint – valency, cross over!)?

3. What is the word equation for the reaction of sodium with oxygen?

4. What is the word equation for the reaction of sodium with water?

5. What is the word equation for the reaction of sodium with hydrochloric acid?

Ores

1. Unreactive metals can be extracted from their ores by heating them, more reactive metals can be extracted from their ores by heating them with carbon and very reactive metals require electrolysis.

Complete the table showing how you would extract these metals from their ores.

Metal	Reactivity of metal	Extraction Method
Silver	Unreactive	
Sodium	Very reactive	
Copper	Quite reactive	
Iron	Quite reactive	
Potassium	Very reactive	

2. What is a Blast Furnace used for?

3. Write down the word and equations for two reactions that happen in a Blast Furnace.

Word:

Word:

Date Due _____

Corrosion

1. What is corrosion?

2. What is rusting?

3. Write down three ways that we can prevent metals corroding

4. Sometimes metals are galvanised to prevent corrosion. What metal is used in this process?

5. Cars rust (corrode) faster in the winter than the summer. Why is this?

Displacement and Equations

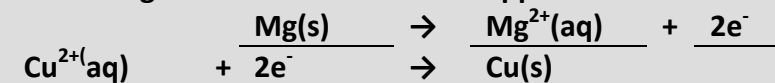
1. What is displacement?

2. If a solid metal is higher in the electrochemical series than a metal in solution, displacement will occur. Using p10 of the data book at http://www.sqa.org.uk/files_ccc/ChemistryDataBookletSQPN5.pdf, state whether a displacement reaction would occur for these pairs...

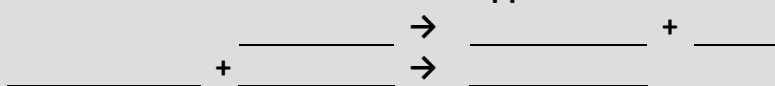
Solid Metal	Metal in Solution	Displacement Occurs?
Magnesium	Copper	Yes
Copper	Magnesium	No
Magnesium	Sodium	
Silver	Zinc	
Zinc	Aluminium	
Calcium	Aluminium	
Aluminium	Zinc	
Silver	Copper	
Magnesium	Zinc	

3. If you write down the equations for a displacement reaction, you must reverse the equation for the solid metal. Using p10 of the data book at http://www.sqa.org.uk/files_ccc/ChemistryDataBookletSQPN5.pdf, write down the equations for these reactions.

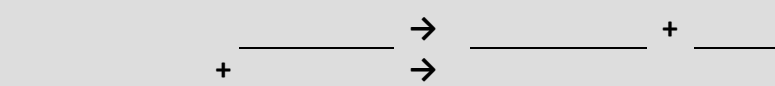
Solid Magnesium metal added to copper solution



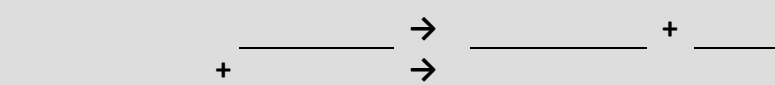
Solid Aluminium metal added to copper solution



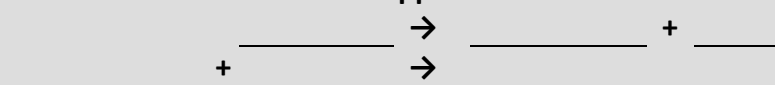
Solid zinc metal added to aluminium solution



Solid calcium metal added to zinc solution



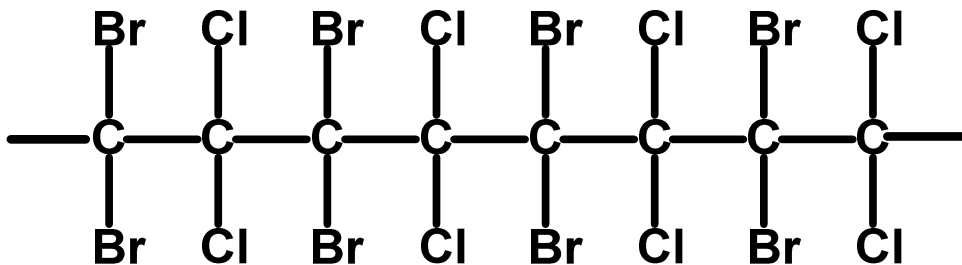
Solid iron metal added to copper solution



Properties of Plastics

Date Due _____

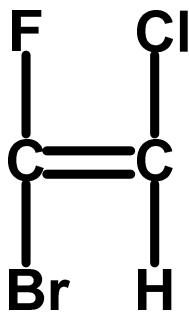
Polymers



1. Draw the monomer and repeating unit for the polymer show above

Monomer

repeating unit



2. Draw the polymer made from the monomer shown above.

3. Draw the repeating unit for this polymer.

Fertilisers

Date Due _____

Fertilisers

1. What are the three elements most fertilisers contain?

2. Complete the table with the chemical formulae of these common fertilisers (maybe Google is your friend if you can't work it out!)

Ammonium nitrate	
Ammonium phosphate	
Ammonium sulfate	
Urea	
Potassium nitrate	

Why is each substance above a good fertiliser (hint: think about the elements they contain?)

3. What are the problems with using fertilisers?

4. Why do we need to use fertilisers?