	Chemistry Paper 1 Tick List			
C1 Atomic Structure and the Periodic Table				
	Atomic Structure			
1.	Define atom, element, compound and mixture. Identify them from examples			
2.	Use chemical symbols to produce chemical formulae of elements & compounds and to name compounds			
3.	Write word and balanced chemical equations			
4.	Write balanced half equations and ionic equations where appropriate.			
5.	Describe different separation techniques including filtration, crystallisation, simple distillation, fractional distillation and chromatography, identify when then would be used			
6.	Use the atomic and mass number to work out the number of protons, neutrons and electrons in an element			
7.	Describe the difference between the plum pudding & nuclear model of the atom			
8.	Identify the mass and charge of protons, neutrons and electrons			
9.	Describe what an isotope is and work out the average mass numbers from % abundance.			
10.	Describe how atoms form ions			
11.	Use SI units to describe the size of an atom and its nucleus			
12.	Draw the electronic configuration for the first 20 elements			
	Periodic Table			
13.	Describe how modern periodic table is arranged			
14.	Describe the work of Newlands and Mendeleev in the development of the periodic table			
15.	Explain the properties of elements in group 0			
16.	Describe the electronic structures of metal and non-metals & link to reactivity			
17.	Describe the properties and trends of alkali metals, write equations for their reaction with water			
18.	Describe the properties and trends of halogens and complete halogen displacement reactions			
C2 Bonding, Structure and Properties				
19.	Describe & explain why atoms bond ionically, represent with dot & cross diagrams			
20.	Describe & explain properties of ionic compounds, including their melting and boiling point and when they can conduct electricity			
21.	Describe how elements bond covalently, represent with dot and cross & ball and stick diagrams			
22.	Work out the empirical formula of ionic compounds			
23.	Describe the limitations of using dot and cross, ball and stick, two and three-dimensional diagrams to represent molecules or giant structures			
24.	Describe and **explain** why simple covalent structures have a low boiling point and how it is affected by the size of the molecule			
25.	Explain why small molecules and polymers do not conduct electricity			
26.	Describe and explain why giant covalent structures have a high melting/boiling point			
27.	Describe the structure and properties of diamond, graphite and silicon dioxide			
28.	Describe the relationship between graphite and graphene			
29.	Describe the structure and properties of fullerenes and nanotubes			
30.	Describe metallic bonding & explain properties of these giant structures, including why they conducting thermal energy & electricity, have high melting & boiling points			
31.	Compare the structure of pure metals and alloys and why pure metals are more malleable			

C3 Chemical calculations				
32.	Explain the law of conservation of mass, calculate mass of reactant/product			
33.	Calculate the relative formula mass of a compound			
34.	Calculate the percentage of an element in a compound			
35.	Describe what a mole is using Avogadro's constant			
36.	**State the SI units for amount of substance**			
37.	**Calculate the number of moles or mass of a substances**			
38.	**Calculate masses of reactants and products**			
39.	**Use balanced symbol equations to calculate reacting masses**			
40.	**Identify the limiting reactant in a reaction & describe its effect on the amount of product**			
41.	**Use symbol equations to calculate reacting masses with a limiting reactant**			
42.	Describe what the concentration of a solution is			
43.	Calculate the concentration of a solution when given the mass and the volume			
44.	**Explain how the concentration of a solution can be changed**			
C4 Chemical Changes	**a. Reactivity Series**			
45.	Explain reduction and oxidation in terms of gain and loss of electrons			
46.	Describe and write equations for the reactions of metals with water and dilute acids			
47.	Describe how metals can be extracted, including reduction by carbon and hydrogen			
48.	Explain what a displacement reaction is & why it occurs, write equations for displacement reactions			
49.	**Describe displacement reactions using ionic and half equations, identify what has been oxidised and what has been reduced**			
50.	**Describe how high grade copper is extracted by smelting and sulfuric acid**			
51.	**Describe how low grade copper can be extracted using bioleaching and phytomining**			
52.	**Describe how copper can be purified from solutions using electrolysis and scrap iron**			
	b. Electrolysis			
53.	Describe the process of electrolysis and the movement of positive and negatively charged ions in electrolysis			
54.	**Write half equations to represent the reactions at the electrodes and identify what has been oxidised and reduced**			
55.	Describe the electrolysis of aluminium oxide. Why is cryolite used and why is CO_2 formed?			
56.	Describe the electrolysis of sodium chloride solution and products made			
57.	Explain the products made during the electrolysis of salt solutions based on the reactivity of the ions			
	c. Reactions of Acids			
58.	Describe the difference between an alkali and a base			
59.	Describe how to make a salt by reacting a metal with an acid and write equations, include state symbols			
60.	Describe how to made a salt from an soluble base (metal oxide, metal hydroxide or a metal carbonate) and write equations			
61.	Describe what a neutralisation reaction is and what is produced.			
62.	Write the ionic equation for neutralisation, include state symbols			
63.	Describe what ion makes solutions acidic or alkaline			
	Describe what the pH scale measures			
64.	**Describe how an acid can be strong or weak and explain the difference between the concentration and strong and weak acids. Plan an investigation to identify a strong or weak acid**			
65.	**Describe how the concentration of hydrogen ions relates to the pH number**			
C5 Energy Changes				
66.	Define exothermic and endothermic reactions and give examples			
67.	Define activation energy			
68.	Draw and label reaction profile diagrams			

69.	**Identify bonds broken and made during a reactions and explain the energy change in terms of these**			
70.	**Calculate the energy change for a reaction using bond energies, including units**			