

# ***Trilogy Chemistry Paper 1 Revision checklist***

Key Point	1	2
<b>Atomic Structure &amp; the Periodic Table</b>		
Describe the structure of an atom and calculate numbers of protons, neutrons and electrons given a periodic table		
Describe the development of the nuclear model of the atom from earlier models – e.g the plum pudding		
Describe how mixtures can be separated using filtration, evaporation, distillation and chromatography		
Compare the size of atoms to other items		
Explain what is meant by an isotope and calculate the Atomic mass of an element given the percentage abundance of its isotopes		
Draw the electron configuration for any of the first 20 elements in the periodic table.		
Describe some of the steps in the development of the Periodic Table		
Describe how atoms become ions and represent this using diagrams		
Explain why group 0 do not form ions and describe the properties of group 0 elements		
Describe the properties of the Group 1 metals and their reactions with oxygen and water		
Explain why Group 1 reactivity increases going down the group		
Describe the properties of group 7 elements.		
Describe and explain the trend in reactivity of group 7 down the group		
Interpret practical observations to prove reactivity in group 7 – ie displacement of less reactive halogens		
<b>Bonding &amp; Properties</b>		
Describe the particle arrangement in solids, liquids and gases and explain how changes of state occur		
Describe the formation of ionic bonds between metal and non-metal atoms and represent this in diagrams and models		
Use dot and cross diagrams to show the transfer of electrons in ionic bonding		
Describe the properties of ionic compounds		
Represent covalent bonds using dot and cross diagrams		
Describe the properties of simple and giant covalent substances		
Describe the structure and bonding of carbon in the forms of diamond, graphite and fullerenes and relate their properties to the bonding		
Represent the bonding in polymers using diagrams and explain why most polymers are solids at room temperature		
Describe the bonding in metals and relate the properties of metals to the bonding		
<b>Quantitative Chemistry</b>		

Explain what is meant by 'conservation of mass' and apply it to chemical equations		
Calculate relative formula mass		
Know that a mole represents $6.02 \times 10^{23}$ atoms or molecules and is equal to the atomic or formula mass in grams		
Use the equation $\text{Mass} = M_r \times \text{moles}$ to work out number of moles, mass or formula mass, given the other two		
Calculate the mass of reactants and products in a symbol equation and use these to predict the masses of reactants needed or products expected		
Use moles to balance symbol equations		
Calculate the mass of a given solid in a specified volume of a solution of a given concentration		

### Chemical Change

Define the terms oxidation and reduction in terms of reactions with oxygen		
Identify which substances have been oxidised or reduced in a given equation in terms of gain or loss of oxygen		
Evaluate metal extraction methods given appropriate information		
Describe the reactions of K, Na, Li, Ca, Mg, Zn, Fe and Cu with dilute acids and water		
Derive the reactivity series for metals given information about displacement reactions		
Explain reactivity in terms of a metal's tendency to form ions		
Identify which species has been oxidised and which has been reduced in terms of gain or loss of electrons in given equations		
Write half equations for oxidation and reduction		
Describe the test for hydrogen gas		
Describe the formation of a soluble salt by neutralising acids with metal oxides or metal carbonates		
Describe the reactions of acids and alkalis and the use of indicators		
Explain the meaning of the terms 'strong' and 'weak' acids		
Explain the process of electrolysis in terms of movement of ions to the electrodes and the loss or gain of electrons		
Describe the extraction of Aluminium from its oxide using electrolysis		
Predict the products from the electrolysis of solutions and explain why hydrogen is often given off at the cathode		

### Energy Changes

Describe and recognise exothermic and endothermic reactions		
Describe some of the variables that can affect temperature change in endothermic and exothermic reactions		
Use bond energies to determine whether a reaction will be endothermic or exothermic		

## **Trilogy Chemistry paper 2 Revision checklist**

Key Point	1	2
<b>Rates and extent of chemical reactions</b>		
Describe ways of measuring rates of reaction – e.g mass/volume of product in a specific amount of time		
Use collision theory to <u>explain why</u> rates of reaction slow down as they progress		
Describe and explain patterns in graphs showing rates of reaction		
Calculate rates of reaction given data or graphs, using change/time, <b>including drawing tangents to a curve</b>		
Describe and explain how reactions are affected by temperature, concentration, surface area, pressure (gaseous reactions) & catalysts		
Explain what is meant by a reversible reaction and know how to represent them in equations		
Define the terms 'closed system', 'yield' and 'dynamic equilibrium'		
Predict the energy change in a reversible reaction given information about one of the reactions		
Describe factors that can affect the position of equilibrium		
<b>HT Apply Chatelier's principle to any given reaction to predict the effects on yield of changing temperature, pressure or concentration of reactants</b>		
<b>Predict optimum yield conditions given some information about a reversible reaction</b>		
<b>Explain why the conditions chosen industrially are often 'compromise' conditions</b>		
<b>Organic chemistry</b>		
Define a hydrocarbon		
Describe the structure of crude oil		
Describe uses of crude oil – fuels, feedstock for petrochemicals etc		
Name and draw the first five alkanes		
Describe how the properties of alkanes change with increasing chain length		
Describe how the different chain lengths are separated using fractional distillation		
Describe complete and incomplete combustion of alkanes and represent and recognise equations showing this		
Explain why cracking is necessary		
Describe different methods for cracking		
State the products of cracking		
<b>Represent cracking using equations</b>		
Describe the test for alkenes and its positive result		
<b>Chemical Analysis</b>		
Define a pure substance and a formulation		

Describe how purity can be checked using melting and boiling points		
Give some examples of formulations		
Describe how soluble substances can be separated using paper chromatography		
Interpret chromatograms		
Calculate Rf values for given chromatograms		
Describe the test and positive results for chlorine gas, hydrogen, oxygen and carbon dioxide		
<b>The evolution of the atmosphere</b>		
Give the approximate composition of Earth's atmosphere today		
Describe the likely composition of Earth's early atmosphere		
Describe and explain how Earth's atmosphere has changed – condensation, sedimentation, photosynthesis etc		
Name the two greenhouse gases and explain why their concentration in the atmosphere is increasing		
Explain the 'greenhouse effect' and how this is linked to climate change		
Describe some of the consequences of climate change		
Define 'carbon footprint' and give ways of reducing it		
Describe how carbon monoxide, soot, sulphur dioxide and nitrogen oxides are made		
Explain the environmental problems linked to soot, sulphur dioxide, nitrogen oxides and carbon monoxide		
<b>Using resources</b>		
Explain the difference between finite and renewable resources		
Evaluate the extraction of finite resources – jobs, economy, energy use, pollutants such as CO <sub>2</sub>		
Define the term 'sustainable development'		
Define the term 'low grade ore'		
Explain how phytomining and bioleaching can be used to extract metals such as copper from low grade ore sites		
Explain the benefits of recycling or reusing metals, glass and plastics		
Explain what a 'life cycle assessment' is and why they may be biased		
Explain what 'potable' water is		
Describe how water can be made potable using distillation, filtration and sterilisation and desalination		
Evaluate the production of potable water using distillation and desalination		
Label the equipment used to distil water and explain the processes involved		
Explain the stages in sewage water treatment		

**Also, from paper 1: Atomic structure & periodic table, bonding and properties of different substances, quantitative chemistry,**

