

<p style="text-align: center;">ADDITIONAL SCIENCE C2: CHEMISTRY</p> <p style="text-align: center;">Higher content in bold</p>	Video	Exam Q	☺ ☹ ☹ ☹
Structure and Bonding			
Define element and compound.			
Describe bonding in terms of achieving noble gas electron configuration.			
Describe how ions are formed & represented using diagrams (group 1 & 7 elements)			
Explain the structure of an ionic lattice.			
Describe how covalent bonds are formed.			
Represent the formation of covalent bonds using dot and cross and line diagrams.			
Describe simple molecular and giant covalent structures.			
Draw bonding in H ₂ , Cl ₂ , HCl, H ₂ O, NH ₃ & CH ₄ & describe in diamond & silicon dioxide.			
Describe the arrangement of atoms in metals, in terms of delocalised electrons.			
State the properties (melting/boiling point & conductivity) of simple molecular substances.			
Explain the low melting/boiling point in terms of overcoming forces of attraction.			
Explain the lack of electrical conductivity in simple molecular substances.			
Explain the high melting and boiling points of ionic compounds.			
Explain the electrical conductivity in molten and aqueous solutions of ionic compounds.			
Explain why giant covalent structures have very high melting points.			
Explain, in terms of bonding, why diamond is hard.			
Explain, in terms of bonding, why graphite is slippery and conducts electricity.			
Describe some uses of fullerenes.			
Explain, in terms of bonding, why metals conduct heat and electricity.			
Explain, in terms of the structure, why metals are malleable.			
Define alloy, and explain why they are harder than pure metals.			
Describe shape memory alloys, using Nitinol in braces as an example.			
Describe how polymers with different properties may be produced.			
Describe & explain the differences between thermosetting and thermosoftening plastics.			
Define nanoscience.			
Link some of the use of nanomaterials to their properties.			
Atomic Structure and Quantitative Chemistry.			
Draw an atom to show the location, mass and charge of protons, neutrons & electrons.			
Define and work out atomic number and mass number.			
Define isotope.			
Define relative atomic mass (Ar).			
Calculate relative formula mass (Mr) from the formula of a compound.			
Define a mole.			
Describe why instrumental methods are good for detecting and identifying substances.			
Describe how to identify additives, including paper chromatography.			
Explain how gas chromatography can separate a mixture.			
Describe how mass spectrometry can be used to give Mr of each component.			
Calculate the percentage by mass of an element in a compound.			
Work out the empirical formula from masses or % of elements in a compound.			
Calculate masses of reactants and products from balanced equations.			
Explain why yield will always be less than expected.			
Calculate percentage yield.			
Define a reversible reaction and recognise from their equations.			

Rates of Reaction			
Calculate the rate of a chemical reaction.			
Describe how reactions occur in terms of particles.			
Define activation energy.			
List the factors that can affect the rate of a reaction.			
Explain how each of these factors affect rates of a reaction, in terms of particles colliding.			
State what catalysts can do.			
Explain why catalysts are important in industrial processes.			
Endo and Exothermic Reactions			
Define an endothermic reaction, giving examples of some .			
Define an exothermic reaction, giving examples of some.			
Link endo/exothermic reactions and reversible reactions.			
Link some of the use of nanomaterials to their properties.			
Acids, Bases and Salts			
State what (s), (l), (g) and (aq) in equations mean.			
Describe the three things acids can be reacted with to make a soluble base.			
Describe how solid salts can be formed from salt solutions.			
Describe how insoluble salts can be made and how to separate the salt.			
Write equations to show how insoluble salts are formed.			
Explain how precipitation reactions can be used to treat drinking water.			
Write a definition for a base with examples.			
Describe what an alkali is.			
Identify the name of the salt based on the acid used (e.g. nitric acid produces nitrate salts).			
Write an equation to show the reaction between an acid and a metal or an acid and a base.			
Describe what sort of solution is produced when ammonia is dissolved in water.			
Give one use of ammonia.			
State the ions present in an acidic solution and an alkaline solution.			
Write an ionic equation to show how these ions react together in a neutralisation reaction.			
Describe acids and bases in terms of the pH scale.			
Electrolysis			
Define the terms 'electrolysis' and 'electrolyte'.			
Explain why an ionic substance needs to be melted or dissolved for electrolysis to happen			
State which ions will go to the positive and negative electrodes during electrolysis.			
Give examples of what electroplating can be used for.			
Describe reduction and oxidation and state which electrode they are taking place at.			
Use a reactivity series to decide which ion will go to each electrode.			
Write half equations for the reactions at each electrode.			
Describe electrolysis of aluminium oxide to form aluminium, including products at electrodes.			
Label a diagram to show what is produced during the electrolysis of sodium chloride solution.			
Give a use for each of the three products of the electrolysis of sodium chloride solution.			

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