



# The Bridge to Post-16 Summer Work



## Chemistry OCR A

This pack contains a programme of activities and resources to prepare you to embark on your Post-16 course in Chemistry in September.

It should be completed throughout the remainder of the Summer term and over the Summer Holidays to ensure you are ready to start your course in September.

**You MUST have this pack completed before your first lesson in the subject**

The resources include:

1. Links to three websites where you can research the topics you will be exploring in the course and get a flavour of what you will be learning about in Post-16
2. Tasks on key pre-knowledge topics that will help you to be successful in your course.
3. Other relevant revision/questions to help bridge between GCSE and Post-16 courses
4. Suggested therapies to help you if you are struggling with the tasks

Overall, we suggest you spend around 3 hours of total work working through the tasks for Chemistry

Therefore, in total, across your 3 subjects you should be completing 9 hours of Summer Work.

### Useful Websites

Cognito GCSE Chemistry videos [GCSE Chemistry \(9-1\) - YouTube](#)

BBC bitesize <https://www.bbc.co.uk/bitesize/examspecs/z8xtmnb>

OCR <https://www.ocr.org.uk/qualifications/as-and-a-level/chemistry-a-h032-h432-from-2015/>

### If you are struggling

Remember, we will be revisiting and building on all of your GCSE knowledge and skills during the course. Make a note of any task you find particularly difficult and let us know.

Making the transition from GCSE Combined Science of GCSE Chemistry to A Level can feel like huge Challenge, especially considering the difference in the grade boundaries. However, the GCSE specification does provide an excellent foundation and there is lots of content which is the same at both levels. Your task is to RAG rate the statements, identify those that you need to revisit to ensure your knowledge is secure and matches the grade you are aiming for at A Level. This content will also form the basis of your first assessment. You need to be able to evidence the 3 hours of work

you have done, saying “I read these pages” or “watched these videos” is not enough, but you are free to choose how you approach the task!

Percentage	Approx AQA GCSE Grade	Approx OCR AS Level Grade	Approx OCR A Level Grade
37	6/5	U	E
47	7/6	E	D
57	8/7	D	C
67	8/9	C	B
77	9+	B	A
87	9++	A	A*

Pages in italics refer to GCSE Chemistry revision guide

Cognito videos are available via link above

Content	RAG	CGP GCSE revision guide pages	CGP GCSE workbook pages	CGP A Level revision guide pages	Cognito video number
<b>Section 1 - Atoms and reactions</b>					
Isotopes as atoms of the same element with a different number of neutrons and different masses		97 13	92	15	2
Atomic structure in terms of the number of protons, neutrons and electrons of atoms and ions given the atomic number, mass number and ionic charge		96-97 12-13	91-92	14	1
Explanation of the terms <i>relative atomic mass</i> based on the mass of a carbon-12 atom		96-97 12-13	92	18	2
Use of the term <i>relative molecular mass</i> and <i>relative formula mass</i> and their calculations from relative atomic masses		123 41	122	18-19	24
Writing formulae of ionic compounds from ionic charges, including prediction of ionic charge from the position in the periodic table		112,114 28,30	108 109-112	26-27	13
Construction of balanced equations, including state symbols, given appropriate information		99 15	94	24-25	4
Mole as the unit for amount of substance		124 42	123	20	25
The Avogadro constant as the number of particles per mole, $6.02 \times 10^{23}$		124 42	123	20	25
The formulae of common acids (HCl, H <sub>2</sub> SO <sub>4</sub> , HNO <sub>3</sub> ) and common alkalis (NaOH) and explanation that acid release H <sup>+</sup> ions and alkalis release OH <sup>-</sup> ions in aqueous solution		130 51	130	28	34
Qualitative explanation of strong and weak acids in terms of relative dissociation		130 53	131	28	35
Neutralisation as the reaction of H <sup>+</sup> and OH <sup>-</sup> to form H <sub>2</sub> O		129 51	130	28	36
Reaction of acids with carbonates, metal oxides and alkalis to form salts, including writing equations		131 54	132-133	29	36
Oxidation and reduction in terms of electron transfer		134 57	136	38	39
<b>Section 2 – Electrons bonding and structure</b>					
Ionic bonding as electrostatic attraction between positive and negative ions, and the construction of ‘dot-and-cross’ diagrams		113 29	109-110	42	14
Giant ionic lattices, resulting from oppositely charged ions strongly attracted in all directions e.g. NaCl		114 30	111-112	43	15
The effect of structure and bonding on the physical properties of ionic compounds, including melting point, solubility and electrical conductivity in solid, liquid and aqueous states		114 30	111-112	43	15
Covalent bonding as the attraction between a shared pair of electrons and the nuclei of bonded atoms		115 31	113-114	44	16
Construction of ‘dot-and-cross’ diagrams of molecules to describe single and multiple covalent bonding		116 31-32	113-114	44-45	16

<b>Section 3 – Periodic table and energy</b>					
The periodic table as the arrangement of elements by increasing atomic (proton) number, in periods showing repeating trends in physical and chemical properties and in groups having similar chemical properties		106	102	54	9
Metallic bonding as the electrostatic attraction between positive ions and delocalised electrons forming giant lattice structure		119 35	119	60	20
Giant covalent lattices of carbon (diamond, graphite, graphene) as networks of atoms bonded by strong covalent bonds		117-118 33-34	117-118	59-60	18,19
Explanation of the physical properties of giant metallic and covalent lattices, including melting point, solubility and electrical conductivity		117-119 33-35	117-119	61	18,19,20
The existence of halogens as diatomic molecules and explanation of the trend in the boiling point of Cl <sub>2</sub> , Br <sub>2</sub> and I <sub>2</sub>		109 25	105	64	12
The trend in reactivity of the halogens Cl <sub>2</sub> , Br <sub>2</sub> and I <sub>2</sub> , illustrated by their reaction with halide ions, Cl <sup>-</sup> , Br <sup>-</sup> and I <sup>-</sup>		109 25	105-106	64-65	12
Explanation of the trend in reactivity of the halogens from the decreasing ease of forming 1- ions, in terms of attraction, atomic radius and electron shielding		109 25	105-106	64	12
The benefits of chlorine in water treatment (killing bacteria) contrasted with associated risk (e.g. risk of toxic chlorine gas)		102	172	67	74
<b>Section 4– Physical chemistry 43</b>					
Explanation that some chemical reactions are accompanied by enthalpy changes that are exothermic ( $\Delta H$ , negative) and endothermic ( $\Delta H$ , positive)		138-139 61-62	141-142	70	43
Construction of enthalpy profile diagrams to show the difference in the energy of reactants compared to products		139 61-62	141-142,146	70	43
Qualitative explanation of the term activation energy, including use of enthalpy profile diagrams		142-143 61-62	141-142,146	70	43
Use of average bond enthalpies to calculate enthalpy changes		140 63	143	75	44
The effect of concentration on the rate of reaction, in terms of the frequency of collisions		143 68	144-145	77	46,47
Calculations of reaction rate from the gradients of graphs measuring how a physical quantity changes with time		146 71	149	80-81	48
Explanation of the role of catalysts in increasing the rate of reaction without being used up by providing a different reaction route with a lower activation energy		143 68	146	77-79	47
The effect of temperature on the rate of reaction in terms of the frequency of collisions and the proportion of molecules exceeding the activation energy		143 68	146	77	47
Dynamic equilibrium exists in a closed system when the rate of the forward reaction is equal to the rate of the reverse reaction		147 72	150	82	49
Le Chatellier's principle and its application to deduce the effect of a change in temperature, pressure or concentration on the position of equilibrium		148 73	151-152	82	50
Explanation that a catalyst increase the rate of the forward and reverse reaction in an equilibrium by the same amount		148 73	151-152	83	50
<b>Section 5– Core organic chemistry</b>					
Alkanes as saturated hydrocarbons containing single C-C and C-H bonds		150 75	153-154	92	52
Complete combustion of alkanes, as used in fuels, and their incomplete combustion in a limited supply of oxygen with the resulting potential dangers of CO		150 75	153-154	92-93	52
Alkenes as unsaturated hydrocarbons containing a double C=C bond and their reaction with bromine as the test for the presence of a double C=C bond		152 78-79	156-157	96,100	54
Addition polymerisation of alkenes and substituted alkenes to including identifying repeat unit from a given monomer and monomer that would produce a given section of polymer		117 33,80	117	102	23
Absorption of infrared radiation by atmospheric gases (e.g. H <sub>2</sub> O, CO <sub>2</sub> and CH <sub>4</sub> ), the suspected link to global warming		158 92	164-165	112	68