

Exam Board:	AQA
Subject:	Chemistry
Topics:	Paper 1 - 100 marks (1hr 45min) Atomic structure and the periodic table; Bonding, structure, and properties of matter; Quantitative chemistry; Chemical changes; Energy changes Paper 2 - 100 marks (1hr 45min) Rate and extent of chemical change, organic chemistry, chemical analysis, the atmosphere, using resources and skills

Exam Information, guidance and hints

Command words:

- Complete - Fill in gaps/add labels
- Balance - Add large numbers only in front of chemical formula
- Give - Recall a simple fact
- Draw - Draw a symbol, diagram or graph
- Describe - Give details about an event, idea or a process
- Explain - Give reasons for an event, idea or process (use because/so)
- Define - write the meaning of a word or term
- Compare - Identify how things are similar/different
- Suggest - Use your own knowledge in an unfamiliar context
- Plan - Write a method for carrying out a practical
- Calculate - Use numbers in a formula
- Name - Recall the name of a piece of equipment or person
- Estimate - Use data and evidence to predict a value

Hints/tips:

- Use a ruler for straight lines of best fit but not curved lines.
- For calculation questions, use the equations provided
- Ensure you give to answers to the stated number of significant figures or decimal places
- When asked about observations, refer to what you can see happening, not what you know is happening at a molecular level
- When comparing, use comparative language such as whereas, larger, smaller etc
- Ensure you refer to data in graphs and tables when asked to in order to support your explanations
- Uncertainty is calculated by dividing the range of the data by 2.
- **Higher only:** Volume = number of moles x 24

Online Resources

- [Cognito past papers](#)
- [Required Practical Videos from Malmsbury Science - Youtube](#)

Paper 1 - Foundation Example Papers and Markschemes

2018 F Paper	Annotated P1	2018 MS
2019 F Paper	Annotated P1	2019 MS
2020 F Paper	Annotated P1	2020 MS

Paper 2 - Foundation Example Papers and Markschemes

2018 F Paper	Annotated P2	2018 MS
2019 F Paper	Annotated P2	2019 MS
2020 F Paper	Annotated P2	2020 MS

Paper 1 - Higher Example Papers and Markschemes

2018 H paper	Annotated P1	2018 MS
2019 H Paper	Annotated P1	2019 MS
2020 H Paper	Annotated P1	2020 MS

Paper 2 - Higher Example Papers and Markschemes

2018 H paper	Annotated P2	2018 MS
2019 H Paper	Annotated P2	2019 MS
2020 H Paper	Annotated P2	2020 MS

PLC Chemistry Paper 1

Topic	Key information related to topic	Sparx Code	Resources/Information related to topic	How well do you understand this topic? RAG		
				Red	Amber	Green
Atoms	Identify compounds, elements and mixtures	R447	https://cognitoedu.org/coursesubtopic/c2-gcse-aqa-h-t_1.03			
Atoms	Identify the correct equipment to separate mixtures	R550	https://cognitoedu.org/coursesubtopic/c2-gcse-aqa-h-t_1.06			
Atoms	Identify the difference between metals and nonmetals, including their properties	R444	https://cognitoedu.org/coursesubtopic/c2-gcse-aqa-h-t_1.12			
Atoms	Identify the numbers of protons, neutrons and electrons in an atom including completing the electronic structure and explain what the mass and atomic numbers mean.	R945	https://cognitoedu.org/coursesubtopic/c2-gcse-aqa-h-t_1.01			
Atoms	Describe the size and mass of atoms and the subatomic particles they are made from	R646	https://www.youtube.com/watch?v=-FBk8cNvJds			
Atoms	Describe the models of the atom and how models of the atom have changed over time	R793	https://cognitoedu.org/coursesubtopic/c2-gcse-aqa-h-t_1.08			
Atoms	Describe how elements have isotopes and why isotopes are different to atoms	R365 R330	https://cognitoedu.org/coursesubtopic/c2-gcse-aqa-h-t_1.02			
Atoms	Describe the reactions of the group 1 elements	R406	https://cognitoedu.org/coursesubtopic/c2-gcse-aqa-h-t_1.14			
Atoms	Describe the reactions of the group 7 elements	R580	https://cognitoedu.org/coursesubtopic/c2-gcse-aqa-h-t_1.15			
Atoms	Explain the properties of the Group 0 elements	R572	https://www.youtube.com/watch?v=EReyx5QoUSs			

Topic	Key information related to topic	Sparx Code	Resources/Information related to topic	How well do you understand this topic? RAG		
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Atoms	Describe the typical properties observed with the transition elements	R843	https://www.youtube.com/watch?v=A5RpVT1WA8E			
Atoms	Compare the transition elements with those in group 1	R843	https://www.youtube.com/watch?v=A5RpVT1WA8E			
Bonding	Describe the differences in the states of matter, solid, liquid and gas	R252	https://cognitoedu.org/coursesubtopic/c2-gcse-aqa-h-t_2.12			
Bonding	Identify the state symbols associated with chemical equations	R272	https://www.youtube.com/watch?v=h7ErVAZbeu0			
Bonding	Identify the three different types of bond that can form	R868	https://www.youtube.com/watch?v=vUbUoyR6Log			
Bonding	Describe what happens during ionic bonding and represent it on a dot and cross diagram	R868 R557	https://www.youtube.com/watch?v=MdU44WeiLps&t=90s			
Bonding	Explain the properties of ionic compounds	R581	https://www.youtube.com/watch?v=ybi6kQHKVws			
Bonding	Describe how ions are formed	R199	https://cognitoedu.org/coursesubtopic/c2-gcse-aqa-h-t_2.01			
Bonding	Describe metallic bonding and describe the properties of alloys.	R928	https://cognitoedu.org/coursesubtopic/c2-gcse-aqa-h-t_2.1			
Bonding	Explain the properties of alloys	R596	https://cognitoedu.org/coursesubtopic/c2-gcse-aqa-h-t_2.1			
Bonding	Draw dot and cross diagrams to show covalent bonding and describe what covalent bonding is.	R467	https://www.youtube.com/watch?v=7IkYm7ZgiAw			
Bonding	Explain the properties of simple covalent molecules	R283	https://www.youtube.com/watch?v=u_KR0UaZFKY			

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Bonding	Identify a selection of giant covalent structures and describe their structure and properties	R916	https://www.youtube.com/watch?v=SxuldWdqFB0			
Bonding	Describe the structure of fullerenes and graphene	R916	https://cognitoedu.org/coursesubtopic/c2-gcse-aq-a-h-t_2.09			
Bonding	Describe the structure of diamond and graphite	R916	https://cognitoedu.org/coursesubtopic/c2-gcse-aq-a-h-t_2.08			
Bonding	Describe what polymers are and how they form as well as representing them in diagrams	R371	https://www.youtube.com/watch?v=EP0zfm_FVqc&t=65s			
Bonding	Describe what nanoparticles are and explain their uses.	R530	https://cognitoedu.org/coursesubtopic/c2-gcse-aq-a-h-t_2.15			
Quantitative chemistry	Calculate relative formula mass and percentage by mass	R195	https://cognitoedu.org/coursesubtopic/c2-gcse-aq-a-h-t_3.01			
Quantitative chemistry	Calculate the concentration of solutions	R807 R262	https://cognitoedu.org/coursesubtopic/c2-gcse-aq-a-h-t_3.08			
Quantitative chemistry	Explain the law of conservation of mass	R533	https://www.youtube.com/watch?v=YZi5DnMX0XM			
Quantitative chemistry	Explain mass changes when a product or reactant is a gas	R533	https://www.youtube.com/watch?v=YZi5DnMX0XM			
Quantitative chemistry	Define what a mole is and calculate moles using the moles = mass / molecular mass equation	R223	https://www.youtube.com/watch?v=kBlmEfS_P00			
Quantitative chemistry	Higher tier only: Calculate the amounts of substances in equations	R624	https://www.youtube.com/watch?v=TV6n5MFH6IU			

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			https://www.youtube.com/watch?v=5zOpoEN0dVQ&t=7s			
Quantitative chemistry	Higher tier only: Balance equations using mole calculations and ratios	R143	https://www.youtube.com/watch?v=4wTSLBBBMo0			
Quantitative chemistry	Higher tier only: Calculate the limiting reactant masses in equations	R380	https://www.youtube.com/watch?v=LTnhZvyOvFU			
Quantitative chemistry	Higher tier only: calculate atom economy (percentage atom economy)	R474	https://cognitoedu.org/coursesubtopic/c2-gcse-aq-a-h-t_3.09			
Quantitative chemistry	Higher tier only: Use concentration calculations in various multi-step calculations	R262	https://www.youtube.com/watch?v=MEQ1YGxfAQ4&t=4s			
Quantitative chemistry	Calculate the percentage yield of a product	R463	https://cognitoedu.org/coursesubtopic/c2-gcse-aq-a-h-t_3.1			
Quantitative chemistry	Calculate volumes of gases using $V = 24 \times n$	R332	https://cognitoedu.org/coursesubtopic/c2-gcse-aq-a-h-t_3.07			
Chemical changes	Describe metal oxides and how they form as well as writing word equations for their formation	R681	https://www.youtube.com/watch?v=Lk1V0buHEFs			
Chemical changes	Place metals in order of reactivity in the reactivity series and determine other metal positions based on known reactions	R981	https://www.youtube.com/watch?v=NBw5s7cuwMc			
Chemical changes	Identify displacement reactions	R640	https://cognitoedu.org/coursesubtopic/c2-gcse-aq-a-h-t_4.06			
Chemical	Higher tier only: Identify oxidation and	R245	https://www.youtube.com/watch?v=gmbuTI2aril			

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changes	reduction in terms of electrons					
Chemical changes	Describe how metals react with acids and write word equations for it,	R681	https://www.youtube.com/watch?v=NBw5s7cuwMc&t=13s			
Chemical changes	Write word equations for the formation of soluble salts from metal oxides, hydroxides and carbonates	R828 R142	https://www.youtube.com/watch?v=vcxIISVJ6Os			
Chemical changes	Plan a method to make a soluble salt	R885 R412	https://cognitoedu.org/coursesubtopic/c2-gcse-aqa-h-t_11.01			
Chemical changes	Acids and alkali properties and reactions and neutralisation reactions	R529	https://cognitoedu.org/coursesubtopic/c2-gcse-aqa-h-t_4.01			
Chemical changes	Higher tier only: explain how to carry out a titration	R539	https://cognitoedu.org/coursesubtopic/c2-gcse-aqa-h-t_4.02			
Chemical changes	Higher tier only: explaining neutralisation reactions and calculate the concentration of an acid after a titration	R892 R297	https://cognitoedu.org/coursesubtopic/c2-gcse-aqa-h-t_4.04			
Chemical changes	Higher Tier only: Explain the difference between strong and weak acids	R629	https://cognitoedu.org/coursesubtopic/c2-gcse-aqa-h-t_4.03			
Chemical changes	Describe how molten electrolysis works	R672	https://cognitoedu.org/coursesubtopic/c2-gcse-aqa-h-t_4.1			
Chemical changes	Describe how aqueous electrolysis works	R279	https://cognitoedu.org/coursesubtopic/c2-gcse-aqa-h-t_4.12			
Chemical changes	Explain how to separate metals from oxides	R483	https://cognitoedu.org/coursesubtopic/c2-gcse-aqa-h-t_4.08			
Chemical	Higher tier only: describe and explain	R245	https://cognitoedu.org/coursesubtopic/c2-gcse-aqa-h-t_4.08			

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changes	redox reactions including half equations		a-h-t 4.09			
Energy changes	Describe what endothermic and exothermic reactions are	R833	https://cognitoedu.org/coursesubtopic/c2-gcse-aq-a-h-t_5.01			
Energy changes	Draw and explain the shape of reaction profile graphs	R675	https://www.youtube.com/watch?v=hNNvlsQLSV8			
Energy changes	Investigate how temperature changes in different practical situations	R466	https://cognitoedu.org/coursesubtopic/c2-gcse-aq-a-h-t_11.04			
Energy changes	Higher: Calculate bond energies to determine if a reaction is endothermic or exothermic	R769	https://cognitoedu.org/coursesubtopic/c2-gcse-aq-a-h-t_5.02			
Energy changes	Explain how cells and batteries work	R120	https://cognitoedu.org/coursesubtopic/c2-gcse-aq-a-h-t_5.03			
Skills	Calculate the uncertainty in a set of results	R756	https://www.youtube.com/watch?v=sXeUIGW3nRY			
Skills	Convert chemical units such as dm ³ and cm ³	R322	https://www.youtube.com/watch?v=rluAlfmi7x8&t=107s			

PLC Chemistry Paper 2

Topic	Key information related to topic	Sparx Code	Resources/Information related to topic	How well do you understand this topic? RAG		
				Red	Amber	Green
Rates of Reaction	Describe what collision theory is	R895	https://www.youtube.com/watch?v=wbGglfHsx-I			
Rates of Reaction	Describe how to investigate rates of reaction by collecting gas	R280	https://www.youtube.com/watch?v=ssa3wh3RNt0&t=34s			
Rates of Reaction	Explain the effect of factors such as temperature, surface area, concentration and pressure on the rate of a reaction	R895	https://www.youtube.com/watch?v=-4HXaUBbv04			
Rates of Reaction	Explain the effect of adding a catalyst to a reaction	R601	https://www.youtube.com/watch?v=-4HXaUBbv04			
Rates of Reaction	Describe what a reversible reaction and equilibrium are	R768	https://www.youtube.com/watch?v=ty9TczsW5ew			
Rates of Reaction	Explain how energy changes occur in reversible reactions	R768	https://www.youtube.com/watch?v=5rC6f_P_A48			
Rates of Reaction	HT Only: Draw tangents to curves to allow for rates of reaction to be calculated	R771	https://www.youtube.com/watch?v=6LV63WtuvJg			
Rates of Reaction	HT Only: Calculate the rate of a reaction using quantities in terms of moles	R771	https://www.youtube.com/watch?v=UkrBJ6-uGFA&list=PL9louNCPbCxW8AN0t0py7LaKdKSfwL3fP			
Rates of Reaction	HT ONLY: Use Le Chatelier's principles to explain changes in reaction yields	R115	https://www.youtube.com/watch?v=IYyoncESnmQ			
Organic Chemistry	Draw the displayed structure of hydrocarbons	R837	https://www.youtube.com/watch?v=CX2IYWggEBc			
Organic Chemistry	Describe the structure of hydrocarbons	R837	https://www.youtube.com/watch?v=CX2IYWggEBc			

Topic	Key information related to topic	Sparx Code	Resources/Information related to topic	How well do you understand this topic? RAG		
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Organic Chemistry	Compare alkanes and alkenes	R837 R418	https://www.youtube.com/watch?v=Sfm3eHe57PU			
Organic Chemistry	Describe how fractional distillation is used to produce different fractions	R205	https://www.youtube.com/watch?v=CjmriZq5xRo			
Organic Chemistry	Describe the process of cracking	R240	https://www.youtube.com/watch?v=7AWwjKbRa_o			
Organic Chemistry	Describe the process of fractional distillation	R205	https://www.youtube.com/watch?v=CjmriZq5xRo&t=13s			
Organic Chemistry	Describe the structure and formation of the alkenes	R418	https://www.youtube.com/watch?v=CmANMHeeZgw			
Organic Chemistry	Explain the reactions that can occur between the alkenes in combustion and with hydrogen, water and halogens	R900	https://www.youtube.com/watch?v=83ls-rouV-U			
Organic Chemistry	Describe the structure of alcohols	R613	https://www.youtube.com/watch?v=vVwLa1fRsVY			
Organic Chemistry	Describe how alcohol is produced	R465	https://www.youtube.com/watch?v=ZkX9rVtCa7c			
Organic Chemistry	Explain why hydrocarbons are useful as fuels	R837	https://www.youtube.com/watch?v=8PM_tWNFBGY			
Organic Chemistry	Explain the structure and properties of carboxylic acids	R508	https://www.youtube.com/watch?v=ED9EU3FfzyU			
Organic Chemistry	Explain the process of addition polymerisation	R371	https://www.youtube.com/watch?v=1ZUg6ZC3ltA&t=19s			
Organic	Explain the process of condensation	R723	https://www.youtube.com/watch?v=U-eCXeFwTg			

Topic	Key information related to topic	Sparx Code	Resources/Information related to topic	How well do you understand this topic? RAG		
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Chemistry	polymerisation		Y&t=177s			
Organic Chemistry	Describe the structure of amino acids	R692	https://www.youtube.com/watch?v=-iyjH9gsyB8			
Organic Chemistry	Describe the structure of DNA and other naturally occurring polymers	R692	https://www.youtube.com/watch?v=7o27fhO_nm0&t=17s			
Chemical Analysis	Describe what is meant by a pure substance	R281	https://www.youtube.com/watch?v=3oJxWwcnfJY			
Chemical Analysis	Describe how to test for different gases	R443	https://www.youtube.com/watch?v=bcRGfSIMIMw			
Chemical Analysis	Define and give examples of formulations	R256	https://www.youtube.com/watch?v=-OtJI-R-4rU			
Chemical Analysis	Describe how to carry out paper chromatography	R638	https://www.youtube.com/watch?v=TdJ57SQ6GAQ			
Chemical Analysis	Interpret chromatograms from a chromatography investigation	R720	https://www.youtube.com/watch?v=sCvKP_NFG4c			
Chemical Analysis	Analyse and calculate R _f values from chromatograms	R720	https://www.youtube.com/watch?v=TdJ57SQ6GAQ			
Chemical Analysis	Explain how to use flame tests to identify ions	R172	https://www.youtube.com/watch?v=Bd0A44lv2OI			
Chemical Analysis	Explain how to use ion tests to identify metal ions	R172	https://www.youtube.com/watch?v=dBvpd9RhX8E			
Chemical Analysis	Explain how to use ion tests to identify carbonates, sulfate and halide ions	R755	https://www.youtube.com/watch?v=mWTgHjdea4Y			

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Chemical Analysis	Describe how instrumental methods can be used to identify ions including flame emission spectroscopy	R487	https://www.youtube.com/watch?v=1BCc_RrrSSw			
Atmosphere	Describe how the percentages of different gases in the atmosphere have changed over time	R225	https://www.youtube.com/watch?v=l0h_-3M0Pso			
Atmosphere	Explain why the composition of the atmosphere has changed over time	R225	https://www.youtube.com/watch?v=DnFcyhsSVGg			
Atmosphere	Identify and explain the effects of greenhouse gases	R728	https://www.youtube.com/watch?v=Z_b2A-d5hGY			
Atmosphere	Explain how humans are contributing to global climate change	R728	https://www.youtube.com/watch?v=rqWzK_DehtY			
Atmosphere	Explain the impact of carbon footprints and how they can be reduced	R873	https://www.youtube.com/watch?v=A74Sf8U3v_E			
Atmosphere	Explain the effects of atmospheric pollutants	R119	https://www.youtube.com/watch?v=2ri95j0cShg&t=140s			
Resources	Explain the importance of sustainable development	R912	https://www.youtube.com/watch?v=pKOf6WvYgMQ			
Resources	Describe the processes involved in producing potable water from groundwater, salt water and sewage	R898	https://www.youtube.com/watch?v=PDeiRIQvWnM			
Resources	Describe how to calculate the mass of salt found in a salt solution	R759	https://www.youtube.com/watch?v=DikcEq2wg8g&t=167s			
Resources	Evaluate the use of different materials and their impact on the environment	R228	https://www.youtube.com/watch?v=obb-ZHqBw10			

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Resources	Explain the importance of life cycle assessments and how to carry one out	R826	https://www.youtube.com/watch?v=-i_Eug83uzo			
Resources	Explain how to reduce the use of resources	R228	https://www.youtube.com/watch?v=BrMcHPwHat8			
Resources	HT Only: Explain how to extract metals from their low grade ores	R403	https://www.youtube.com/watch?v=b5RVPauf4oM			
Skills	Calculate relative formula mass	R195	https://www.youtube.com/watch?v=it_fmQu5ivg			
Skills	Identify variables in an investigation	N/A	https://www.youtube.com/watch?v=nKbUbfadxRU			
Skills	Draw a variety of different types of graph (bar, scatter)	R703 R148	https://www.youtube.com/watch?v=VM3i6-gvKSA			