



Curriculum map – Year 10 Combined chemistry

YEAR 10 TOPIC(s)	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
What students will know	Chemistry of the atmosphere Methane and water vapour as additional greenhouse gases, how the Earth is warmed, climate change, how to reduce their carbon footprint, identify and explain the issues (global warming, acid rain, global dimming, respiratory issues) with the products (C, CO, CO ₂ , SO ₂ , NO _x) of complete and incomplete combustion	Atomic structure How many electrons fill each of the shells, why elements form ions, what happens when compounds are formed, that symbol equations need to be balanced to show the conservation of mass, the different methods used to separate mixtures.	Atomic structure (continued) How the model of the atom has changed and reasons why, how the periodic table has changed, why group 1 metals get more reactive as you go down the group, why group 7 metals get more reactive as you go up the group, why the noble gases are unreactive.	Chemical analysis and energy changes The difference between a pure substance, formulation and mixture, how to identify unknown substances using chromatography, exothermic and	Bonding ionic, covalent and metallic bonding Covalent – non-metals only, molecules, share electrons, covalent bonds are strong Ionic – metals and non-metals, ions, donate or gain electrons Giant covalent structures contain many covalent bonds Diamond Graphite Silicon dioxide How to evaluate scientific models	Bonding (continued) Simple covalent structures (CO ₂ , NH ₃ , H ₂ O, etc) have low melting points as they have weak intermolecular forces

YEAR 10	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
What students will be able to do	Use data (tables, graphs, bar charts), to draw conclusions, calculate their carbon footprint	Calculate the subatomic particles in an atom draw the electronic structure for the first 20 elements, calculate the ionic charge of elements in groups 1,2,3,5,6,7, write the ionic formula using the charge of each ion, balance chemical equations, separate mixtures using the correct technique.	Separate mixtures using the correct technique, calculate the average relative atomic mass using the masses of an element's isotopes, predict trends in different groups of the periodic table.	Complete the required practical to calculate the R_f value using their chromatograms to identify unknown substances Complete the required practical on exothermic and endothermic reactions Calculate the bond energy of reactants and products to determine if they are exothermic or endothermic reactions Draw the reaction profile for exothermic and endothermic reactions	Draw ionic and covalent bonds, evaluate the use of scientific models	Predict physical properties of substances
Extended reading opportunities			Students read about the work of the different scientists who created the model of the atom and they use this information to create their own timeline of events.	Read the method to carry out practical work independently		

YEAR 10	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
Beyond the classroom	<p>How well do climate laws help reduce global warming https://www.sciencejournalforkids.org/wp-content/uploads/2021/07/legislation_article.pdf</p> <p>BBC iPlayer – Climate change – the facts https://www.bbc.co.uk/iplayer/episode/m00049b1/climate-change-the-facts</p>	<p>Atoms and the periodic table https://www.youtube.com/watch?v=bw5TE5o7JtE</p> <p>A boy and his atom: The World's smallest movie https://www.youtube.com/watch?v=oSCX78-8-q0</p>	<p>The modern understanding of the atom https://www.youtube.com/watch?v=c4RO9BlyMqI</p>	<p>Dissolving salt to cool homes https://edu.rsc.org/science-research/cooling-homes-with-an-endothemic-reaction/4014613.article</p>	<p>Can materials of the same elements have different properties? https://www.sciencejournalforkids.org/wp-content/uploads/2022/08/sugar_article.pdf</p> <p>Can graphene in your clothing stop mosquito bites? https://www.sciencejournalforkids.org/wp-content/uploads/2020/01/graphene_article.pdf</p> <p>Graphene: a new way of thinking about materials https://www.scienceandindustrymuseum.org.uk/objects-and-stories/graphene#:~:text=They%20did%20extensive%20experiments%20and,the%20electrical%20properties%20of%20graphene.</p> <p>Nobel prize winners from the University of Manchester https://www.youtube.com/watch?v=92AJulp9Lbo</p>	