Long Term Plan: Chemistry Year 9

ARCHBISHOP SENTAMU ACADEMY
Church of England

"Science is simply the word we use to describe a method of organising our curiosity."

The programme for years 7 – 11 has staff teaching a single class, with rotating topics/subjects. There is varied order of topics for classes to allow for the rotation of practical equipment. Students will complete a biology, chemistry and then physics topic followed by an assessment. This process will then repeat again.
Staff are to use the **Curriculum Road Map** in the Science Drive to ensure that they rotate at the appropriate times.

Topic	Unit title	Key knowledge/ Content to learn and retain	Essential skills to acquire (subject & generic)	Anticipated misconceptions	Links to previous KS	Links to future KS	Opportunity for stretch for high prior attainers
One	Atomic Structure and Periodic Table	The structure of the atom, including the mass and charge of subatomic particles. The history of the atom, including key moments in the development of the nuclear model Isotopes and atomic structure The arrangement of the periodic table Trends in reactivity of groups one, seven and zero.	Using data to make predictions. The use of timelines Extended writing Reading for comprehension	Students often underestimate just how small atoms are, and how much of them is empty space. Students often mix up the names of the scientists responsible for each discovery.	In year 7 students studied the general arrangement of the periodic table and the dalton model of the atom	This unit directly feeds in the first Unit of GCSE Chemistry.	Considering why the results of the Gold Foil Experiment lead to the development of the nuclear model of the atom.
SMSC & British Values	The contribution of British scientists to scientific understanding.						
Cultural Capital	The historical importance of the various figures that have contributed to the development of the periodic table and the understanding of the atom.						

Career Link	As the central science, Chemistry opens doors to a wide number of STEM field careers.						
Two	Bonding	Ionic bonds as the transfer of electrons and covalent bonds as the sharing of electrons Drawing dot and cross diagrams for ionic and covalent bonds The structure and properties of ionic, simple covalent, giant covalent and metallic bonding. Polymers and fullerenes The size and use of nanoparticles	Using data to make predictions. Interpreting data presented in tabular and graphical form Extended writing (HT Only) Working with standard form	Graphite as a special case, in terms of its conductivity. Students often confuse sharing and transferring electrons and this will need to be practiced extensively. The use of the terms "Intermolecular Forces" and "Electrostatic Forces" The true size of nanoparticles	Students will have previously looked at the common properties of a number of materials, though this will be the first time that students have explored explanations for those properties	This unit feeds directly into Unit 2 of GCSE Chemistry	Considering why graphite is able to conduct electricity in terms of its bonding. Calculating the size of nanoparticles.
SMSC & British Values	The contribution of British scientists to scientific understanding.						
Cultural Capital	The use of new nanotechnology, and its application in a number of fields.						
Career Link	As the central science, Chemistry opens doors to a wide number of STEM field careers.						
Three	Energy Changes	Endothermic and Exothermic Reactions Reaction pathways Bond Energy and bond energy calculations (Triple Only) Fuel cells	Interpreting data presented in both graphical and tabular form. Using laboratory equipment and glassware Recording accurate data Calculating a mean	Mislabelling of the activation energy and overall energy change on reaction profile diagrams. Students often miscalculate bond energies by doing products - reactants rather than reactants - products	This unit builds directly from the energetics unit, studied in year 8; extending students prior knowledge of endothermic and exothermic reactions to explore	Students at A-Level will study energetics in more detail, looking calorimetry, Hess' Law and more complex enthalpy	Students may be challenged to find a missing bond enthalpy if given the overall energy change for a reaction.

			Changing the subject of an equation Using data to evaluate and compare		why this is the case.	calculations	
SMSC & British Values	Mathematical problems can be put into real world contexts to explore a variety of concepts and scenarios						
Cultural Capital	Mathematical problems can be put into real world contexts to explore a variety of concepts and scenarios						
Career Link	As the central science, Chemistry opens doors to a range of STEM Field careers						
Four	Chemical Analysis	Pure and impure substances Chromatography Gas Testing (Triple Only) Flame testing, ion testing and spectroscopy	Following written methods and flow charts Interpreting chromatograms and other experimental results Writing scientific methods Measuring and recording accurate results Safe use of laboratory equipment and glassware. Presenting and interpreting data in both tabular and graphical form.	Students often confuse the results of the various ion tests. Students often describe spectroscopy as being more "accurate" or "Reliable" as opposed to more "Sensitive" or "Precise"	Students have studied the idea of pure and impure substances, mixtures vs compounds and separation techniques at KS3. This unit extends this by introducing deeper analysis - not just separating mixtures but identifying their components.	Organic Analysis is studied in further depth at A-Level, where students will look at more complex spectroscopic methods, such as IR and MS spectroscopy.	Students could be presented with complex mixtures or a number of different solutions and challenged to produce viable methods of identification.
SMSC & British Values	Safe working in the lab, and respect for others workspaces.						
Cultural Capital	The use of spectroscopic methods in real life applications, such as quality assurance and forensic investigation						
Career	As the central science, Chemistry opens doors to a range of STEM Field careers						

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