Chemistry Curriculum Plan

Intent: We aim to provide students with a curriculum that develops their understanding of, and appreciation for, the world around them. As they discover more about their place, impact and role in the world, students will be able to make good choices on a personal level and to grow into responsible global citizens. We will also help students to develop practical skills so that they can safely use the methods and processes that help scientists to make new discoveries and develop new technologies.

Studying chemistry will help students to understand how chemical reactions work, such as those that cause pollution in the atmosphere. This will enable them to engage with a number of current issues such as climate change and also to appreciate the role of chemistry in our everyday lives, from household chemicals to fuels. Chemistry is also a gateway subject to various important and highly competitive careers, so we aim to teach students using evidence-based practice to help form the best possible foundations for each next step of their studies.

Year	What will students learn?	Rationale	How will students be formally assessed?	Real world (disciplinary knowledge/careers/local area)
7	1. Particles 2. Acids and alkalis 3. Elements, compounds and chemical reactions	1. Particles consolidate KS2 and is a key foundation for other science topics across KS3, including diffusion in biology and state changes in physics. 2. Acids and Alkalis gives students an opportunity to introduce practical science to answer a research question, while also linking to chemicals they have in their homes and gardens. 3. This is the core foundations of chemistry – that materials that students meet in their daily life and science lessons are all made of atoms, which can be arranged in mixtures or compounds with distinctive properties.	Formal tests at the end of some topics: Particles (Autumn term) Elements, compounds (spring / summer term, depending on their class's topic teaching order) Will also have formal assessments for Biology and physics topics, totalling 6 assessments in Y7.	Safety in using chemicals and science apparatus (Bunsen burners, pipettes) Using apparatus to make accurate measurements. Recording and interpreting data, both using the apparatus to take accurate measurements and displaying the data as graphs or tables. Techniques to separate mixtures using physical processes. The scientific method, developing and testing a hypothesis.

		This topic also formalises how chemists describe chemical reactions using equations.		Developing using chemical equations from word equations, with an introduction to chemical symbols and formulae that will later be used in balanced symbol equations Introduction to the diversity of careers available that use science skills and knowledge.
8	1a. Trends in the Periodic table 1b. Properties of bulk materials 2. Key chemical reactions (Foundations of chemistry) 3. Rocks	1a. Introduces the Periodic table as a way of organizing elements and data analysis skills to describe the trends in the properties of elements in the same group 1b. Briefly describes how the properties of substances depend on whether the elements are metals or non-metals and how the atoms are arranged. This forms a foundation for later learning about types of bonding and structure. 2. Building practical skills and developing student cognition of the way that the macroscopic chemistry can also be represented as microscopic, with particle diagrams, and symbolic representations as symbol equations. This topic initially focusses on the reactions of metals before introducing more general types of chemical reactions, such as combustion and thermal decomposition.	Formal tests at the end of some topics: Periodic table and properties of substances (Autumn term) Types of chemical reaction (summer term) Will also have formal assessments for Biology and physics topics, totalling 6 assessments in Y8. The rocks topic will be assessed in a continuous assessment, rather than a test.	The idea of testing to identify substances – this will be developed at GCSE Building on previous skills: Using equipment safely, starting to develop own risk assessments depending on the specific practical Recording and interpreting data, both using the apparatus to take accurate measurements and displaying the data as graphs or tables. The scientific method, developing and testing a hypothesis. Developing using chemical equations from word equations, to balanced symbol equations. Understanding and celebrating the natural world and how to care for our environment.

		3. Key rocks and materials content from KS3, using the context of limestone and the local environment From Earth and the atmosphere: ▯ the composition of the Earth ▯ the structure of the Earth ▯ the rock cycle and the formation of igneous, sedimentary and metamorphic rocks		
	Y7-8 omissions from the KS3 national curriculum	From Chemical reactions: ▯ what catalysts do. – covered in Y7 biology as breaking down the food. Rationale – catalysts in chemistry is a standalone topic that is more meaningful when students already understand collision theory and the role of activation energy in chemical reactions, which falls in Y10.		
9	1. Atomic structure 2. The Periodic Table 3. Structure and bonding 4. Chemical changes	The teaching order of the AQA GCSE specification has been adapted from 2021-22 to best accommodate topics that students find challenging, meaning they get a spiral curriculum where topics link both forward and backwards. This is particularly clear in the Quantitative chemistry topic, which has been broken down to introduce concepts where they are relevant to the rest of the theory – relative formula mass with balancing equations or concentration in moles alongside titrations as an example of neutralisation. However the bulk of quantitative chemistry has been delayed to Y10 as students tend to find it challenging.	Multiple choice assessment at end of each sub topic and formal tests at the end of each topic.	History of science – how the scientific method builds on the discoveries of earlier scientists and aims to be the best explanation of the known data / observations. Using standard form to express very small numbers, such as the size of an atom (they will do this in maths in Y9/10). Improving graph skills to select own scale and plot negative numbers. Real life uses of chemical reactions, such as displacement in metal extraction, which provides the

		This allows their confidence in maths to increase, as well as their ability to link to a real-life concept. The content is largely in topics that match the textbooks students use in school and that students have access to an online version of. This supports students accessing work at home – either for homework or other remote learning circumstances. The topic order also matches the exam papers – all paper 1 content is taught before paper 2, to allow the use of un-adapted papers for assessments and to make it clear to student's which topics they need to revise when preparing for their final exams. Students sitting Chemistry GCSE have slightly more content within these topics, but also more teaching time each week, so will not be in exactly the same place at the same time as combined science students, however the overall teaching sequence is shared by all students.		starting materials for many uses and has strong links to the Sheffield area. Developing using chemical equations from word equations, to balanced symbol equations and introducing half and ionic equations. Using a pH probe to measure pH as an alternative to using universal indicator or other indicator, because it gives a numerical answer, rather than a colour. Required practical: making a soluble salt
10	1. Chemical changes continued, including electrolysis 2. Energy changes in chemical reactions 3. Quantitative chemistry 4. Chemical analysis 5. Rate and extent of chemical change		Multiple choice assessment at end of each sub topic and formal tests at the end of each topic. Paper 1 mock towards the end of Y10	Developing half equations in a different context in electrolysis. Required practical: identifying the substances produced in electrolysis of different salt solutions Required practical: measuring the temperature change during a chemical reaction. Triple chemistry only – the chemistry of how a battery and a hydrogen fuel cell work, linking to real life and

				practicing half equations in different contexts. Quantitative chemistry – giving answers to appropriate numbers of significant figures depending on the data in the question and rounding their answer correctly. Using chemical tests to identify substances, building on the gas tests in Y8. Required practical: chromatography including calculating Rf values, as a way of identifying substances present in a mixture. Required practical: investigating factors that affect the rate of a chemical reaction. This allows making and testing a hypothesis, including using new apparatus, such as a water bath to control temperature. Graph plotting and developing ideas around the most appropriate line of best fit for the data.
11	1. Organic chemistry 2. Atmosphere 3. Using resources		Multiple choice assessment at end of each sub topic and	Organic chemistry links well to real life and many of the chemicals around us, including how crude oil is

			formal tests at the end of each topic. Paper 1 mock in December Paper 2 mock in March	processed in order to make useful products. This links to various careers. The impact of chemical processes on the environment, allowing us to make personal choices. Required practical: water treatment
12	1. Elements of Life 2. Developing fuels 3. Elements of the Sea 4. Ozone 5. What's in a Medicine? 6. Chemicals in Industry	We follow the OCR B (Salters H433) curriculum, following the textbook order, which has been designed in conjunction with the University of York to be a spiral curriculum, so topics are introduced within a context and then practiced later in a different relevant context.	Multiple choice assessment at end of each sub topic and extended exam question homework and formal tests at the end of each topic. Y12 mock in May	Contexts made clear at the beginning of each sub-topic. Building on skills from GCSE and excellent preparation for post A level study in the sciences CPACs for required practicals show which skills students are assessed on for each of the key practicals. Students do additional non-assessed practicals to prepare these skills in advance. Students can access a more detailed summary of what knowledge each new chapter builds on and the required maths content at the beginning of the chapter. For the first 4 of 10 chapters, the previous knowledge links to GCSE content, as well as earlier in the A level course.
13	7. Polymers of life 8. Oceans 9. Developing Metals 10. Colour by Design		Multiple choice assessment at end of each sub topic and extended exam question homework and formal tests at the end of each topic. Mock exams in February and April.	