

	Term 1a	Term 1b	Term 2a	Term 2b	Term 3a	Term 3b
7	<p>◆ Apparatus naming and drawing <b>Introduction to key glassware and equipment.</b> <b>Introduction to Bunsen burner</b></p>	<p>◆ Particle model <b>Particle diagrams, states of matter and state changes. State change diagrams.</b></p>	<p>◆◆ Elements, compounds and the periodic table <b>Key group names, journey of the discovery of new elements.</b> <b>Introduction to groups and periods</b></p>	<p>◆◆ Reactions <b>Introduction of compounds, different types of reactions (combustion, displacement, thermal decomposition)</b></p>	<p>◆ Separation techniques <b>Compounds vs mixtures – dissolving, filtering, soluble vs insoluble</b></p>	<p>◆ Separation techniques <b>distillation, chromatography, Rock salt (combining several techniques)</b> Introducing acids and bases</p>
	<p>Learn all about the laboratories you will be studying in and all the exciting equipment you will use throughout your journey into the world of Chemistry.</p> <p>Learn all the technical names of the glassware scientists use and how to draw them properly.</p> <p>Learn how Robert Bunsen lost his sight and use his exciting invention – the Bunsen burner.</p> <p><b>BIG question: Is all chemistry equipment safe?</b></p> <p>SKILLS AND CONTENT: scientific drawing, lab safety, introduction to practical work.</p> <p><a href="#">Hazard symbols link</a> <a href="#">Chemistry glassware</a></p>	<p>Why does jelly wobble? Why can't I squash a table? What happens when I boil the kettle or leave ice in the sun?</p> <p>Learn why matter behaves the way it does, and what happens during state changes.</p> <p>Draw state change diagrams and graphs and investigate what happens to the temperature as you change the state of matter of ice.</p> <p><b>BIG question: How can glass be a liquid if it is so hard?</b></p> <p>SKILLS AND CONTENT: investigative practical work, graph drawing, using scientific models</p> <p><a href="#">States of matter</a></p>	<p>What is everything made of? Why do materials look and behave differently?</p> <p>We explore the journey to discovering a brand-new element and what it takes to make a new scientific discovery.</p> <p>We learn all about the scientist's secret weapon – the periodic table! We find out how to unlock the bountiful information it holds and start learning about some of the amazing elements you have probably never heard of.</p> <p>SKILLS AND CONTENT: periodic table literacy</p> <p><a href="#">Periodic table</a></p>	<p>What kinds of chemical reactions are there? How do they work? How do we represent them in written work in chemistry? What is a compound and how can we make one? This part of term is all about experiments and learning through practical work.</p> <p><b>BIG question: Should we think differently about naturally occurring substances?</b></p> <p>SKILLS AND CONTENT: practical skills, word equations, intro to symbol equations, experimental write-ups</p> <p><a href="#">Reactions</a></p>	<p>Why are some substances easy to separate and others not?</p> <p>Here we learn about the difference between a compound and a mixture.</p> <p>We will work our way through a variety of different separation techniques – try them out ourselves and learn how they work.</p> <p>How can a crime be solved through a chemistry experiment? Find out using crime scene chromatography.</p> <p>SKILLS AND CONTENT: practical skills, experimental write-ups</p> <p><a href="#">Separating mixtures</a></p>	<p>We will work our way through a variety of different separation techniques – try them out ourselves and learn how they work.</p> <p>How could you survive on an island with no fresh water? Discover the answer with distillation.</p> <p>Put all our separation techniques together to learn how we can get pure salt and pure water from rock salt.</p> <p>SKILLS AND CONTENT: practical skills, experimental write-ups</p> <p><a href="#">Separating mixtures</a></p>

	Term 1a	Term 1b	Term 2a	Term 2b	Term 3a	Term 3b
8	<p>◆ Acids and alkalis <b>What is an acid? Key acids and alkali names/formulae. Neutralisation Indicators</b></p>	<p>◆ Metals <b>Properties of metals, metals and oxygen, metals and water</b></p>	<p>Metals and more reactions <b>Alkali metals, displacement reactions, extracting metals</b></p>	<p>◆ ◆ ◆ Balancing equations and more reactions <b>Conservation of mass and endothermic vs exothermic reactions</b></p>	<p>◆ Combustion fuels and pollution <b>Products of combustion and equations. Different fuels</b></p>	<p>◆ Combustion fuels and pollution <b>Atmosphere and atmospheric pollutants. Acid rain, global warming.</b></p>
	<p>How can we drink orange juice, if it is classed as an acid? We will be learning what an acid is, and what its chemical opposite is as well. We will be making indicators and learning how to safely handle potentially corrosive substances.</p> <p>How can you make a bee sting stop hurting? Why does orange juice taste funny after brushing your teeth? Answers to these questions and more.</p> <p>SKILLS AND CONTENT: naming salts, word equations and formulae of acids. Investigations and experimental write-ups <a href="#">Acids and alkalis</a></p>	<p>Discover how the metals, the largest group of elements on the periodic table, behave.</p> <p>What happens when they burn? What happens when they react with water? Do they all behave the same way? Why or why not?</p> <p>Unlock the secret language of scientists – learn how to write and balance symbol equations.</p> <p>SKILLS AND CONTENT: balancing equations, writing word equations, experimental write-ups <a href="#">Metals</a></p>	<p>How do we obtain our metals? Why didn't we discover them all at once?</p> <p>Discover the excitement of the alkali metals and link term 1a topics to what we are learning now.</p> <p>Make predictions about experiments using your new understanding of metals and reactions.</p> <p>SKILLS AND CONTENT: balancing equations, writing word equations, experimental write-ups, extended question answers <a href="#">Metals</a></p>	<p>Why does an ice pack get cold? Why do hand warmers heat up? Explore the chemistry behind reactions that change temperature. Does gas have mass? Can you make new atoms? What happens to the atoms during a chemical reaction? Learn about one of the fundamental laws of the whole universe – conservation of mass. <b>BIG question: Why does magnesium weigh more once it is burnt?</b></p> <p>SKILLS AND CONTENT: using and sketching energy profile diagrams, experimental write-ups, graph skills, maths skills in chemistry <a href="#">endo vs exo</a> <a href="#">conservation of mass</a></p>	<p>What happens when something burns? Why are some fuels better than others? What makes a good fuel and what makes a bad fuel?</p> <p>This term we will look at all things combustion. We will investigate which fuels give us the most energy and try to find out why.</p> <p>SKILLS AND CONTENT: devising hypotheses, experimental methods, analysis and evaluation of evidence, balancing equations <a href="#">combustion</a></p>	<p>What effect does our lifestyle have on the planet? What is causing global warming and how is it different to the greenhouse effect? What is acid rain and how does it develop?</p> <p>We discover answers to all of these questions and more this term.</p> <p>SKILLS AND CONTENT: devising hypotheses, experimental methods, analysis and evaluation of evidence, balancing equations <a href="#">Pollutants</a></p>

	Term 1a	Term 1b	Term 2a	Term 2b	Term 3a	Term 3b
9	<p>◆◆ 4.1.1 Atomic Structure &amp; 4.1.1.2 Mixtures</p> <p><b>Atomic structure and use of the periodic table.</b></p> <p><b>Mixtures vs compounds, revisiting and building on content</b></p>	<p>◆◆ 4.2.1 Bonding</p> <p><b>Ionic, covalent, metallic bonding.</b></p> <p><b>Use of dot and cross diagrams. Properties of matter.</b></p>	<p>◆◆ 4.2.1 Bonding continued</p> <p><b>Ionic, covalent, metallic bonding.</b></p> <p><b>Use of dot and cross diagrams. Properties of matter.</b></p>	<p>◆ 4.4.1 Reactions of metals</p> <p><b>Revisit acids and bases and reactions of acids. Metals and oxygen, metal carbonates and acids, metal oxides and acids</b></p>	<p>◆ 4.4.2 Salt preparation reactions</p> <p><b>Different neutralisation reactions</b></p>	<p>◆ 4.8.2 Gas tests &amp; graph skills</p> <p><b>Test for H<sub>2</sub> O<sub>2</sub> and Cl<sub>2</sub></b></p>
	<p>Revisit and build upon your key separating mixtures knowledge from Y7.</p> <p>Fundamentals of chemistry – we will delve deeper into what a particle is, discovering atoms and what is inside of them. This term builds the foundation for all of your GCSE chemistry knowledge.</p> <p>Understand what is inside an atom and develop your periodic table literacy.</p> <p>SKILLS AND CONTENT: Periodic table literacy, maths for chemistry, <a href="#">Atomic structure</a>.</p>	<p>Learn what actually happens to atoms when they react. Discover dot and cross diagrams and how to represent bonding. Use and evaluate the use of scientific models to represent different types of bonding.</p> <p>Understand how bonding affects how substances behaves. Build upon your base chemistry knowledge.</p> <p><b>BIG question: How do pencils work?</b></p> <p>SKILLS AND CONTENT: dot and cross diagrams, analysis of scientific models <a href="#">Bonding</a></p>	<p>Learn what actually happens to atoms when they react. Discover dot and cross diagrams and how to represent bonding. Use and evaluate the use of scientific models to represent different types of bonding.</p> <p>Understand how bonding affects how substances behaves. Build upon your base chemistry knowledge.</p> <p>SKILLS AND CONTENT: dot and cross diagrams, analysis of scientific models <a href="#">Bonding</a></p>	<p>Re-cap your knowledge of acids and bases from Y8 and build upon it.</p> <p>Revisit the key reactions of acids, write word and symbol equations and consider the ionic formulae of salts.</p> <p>SKILLS AND CONTENT: writing and balancing equations, writing ionic formulae, analysing and evaluating scientific methods <a href="#">Reactions of acids</a></p>	<p>Re-cap your knowledge of acids and bases from Y8 and build upon it.</p> <p>Revisit the key reactions of acids, write word and symbol equations and consider the ionic formulae of salts.</p> <p>SKILLS AND CONTENT: writing and balancing equations, writing ionic formulae, analysing and evaluating scientific methods <a href="#">Reactions of acids</a></p>	<p>If most gases are colourless and odourless, how could you tell what gas has been produced? We will learn the tricks of the trade to identify several key gases, knowledge that comes up in countless exam questions!</p> <p><b>BIG question: Why doesn't air make a squeaky pop when burnt?</b></p> <p>SKILLS AND CONTENT: graph skills, practical skills, analysis of experimental results, <a href="#">Gas tests</a></p>

Term →	Term 1a	Term 1b	Term 2a	Term 2b	Term 3a	Term 3b
10 combined	<p>◆ 5.1.2 Periodic table 5.9.1 Atmosphere</p>	<p>◆ 5.7.1 Organic chemistry 5.6.1 Rates of reaction</p>	<p>◆ 5.6.1 Rates of reaction 5.5.1 Energetics</p>	<p>◆ 5.10.1 Resources</p>	<p>◆ 5.4.1 Metal extraction</p>	<p>◆ 5.4.3 Electrolysis</p>
10 triple	<p>◆ 4.1.2 Periodic table 4.9.1 Atmosphere</p>	<p>◆ 4.7.1 Organic chemistry</p>	<p>◆ 4.7.1 Organic chemistry 4.6.1 Rates of reaction</p>	<p>◆ 4.5.1 Energetics 4.10.1 Resources</p>	<p>◆ 4.4.1 Metal extraction</p>	<p>◆ 4.4.3 Electrolysis 4.5.2 Fuel cells</p>
	<p>Explore the periodic table and build on your Y9 knowledge of the key groups (G1, G7 and G0 – and transition metals for triple award scientists)</p> <p>Learn how our earth's atmosphere developed, what we as humans are doing to alter it, and what consequences it has on your day to day lives.</p> <p>SKILLS AND CONTENT: chart and graph analyses</p> <p><a href="#">Periodic table</a> <a href="#">Groups in the periodic table</a> <a href="#">Transition metals (separates only)</a> <a href="#">Atmosphere</a></p>	<p>As carbon based life forms, organic chemistry is important because it is the study of life and all of the chemical reactions related to life. It plays a part in the development of common household chemicals, foods, plastics, drugs, and fuels that we encounter daily. Combined scientists will also move on to rates of reactions this term – learn how large companies make lots of products very quickly.</p> <p>SKILLS AND CONTENT: graph skills, maths</p> <p><a href="#">organic combined</a> <a href="#">organic separates</a></p>	<p>If energy cannot be created or destroyed, what happens to it in reactions? Build on your Y8 knowledge of energetics, and learn why some reactions heat up whilst others stay cool.</p> <p>Rates of reactions - learn how large companies make lots of products very quickly.</p> <p>SKILLS AND CONTENT: graph skills, maths, <b>BIG question: Why does making a chemical release energy?</b></p> <p><a href="#">rates</a> <a href="#">energetics</a></p>	<p>Where does your water come from? What happens to it when it leaves your house? How do they make water safe to drink – is it really free from all those nasty microbes? This topic teaches us about where all the resources we use in our everyday lives come from, how companies choose what materials to use in their products and how to identify if a product is really as "green" as it appears.</p> <p>SKILLS AND CONTENT: chart, data and graph analyses</p> <p><a href="#">resources</a></p>	<p>Can you go a whole day without seeing something that is made of metal? Chances are the answer is no. This term we will develop our learning from Y8 to find out all the different ways we obtain metals from the earth's crust, and purify them so that we can use them.</p> <p>SKILLS AND CONTENT: reactivity series literacy</p> <p><a href="#">Reactions of metals</a></p>	<p>If sodium is so reactive that we have to store it under oil to ensure that it doesn't react with the very air around it – how can we ever have extracted it from the earth as an element?</p> <p>Finally we will start to look at how the most reactive metals are extracted using man's best friend – electricity.</p> <p>SKILLS AND CONTENT: ionic formulae, naming compounds, reactivity series literacy</p> <p><a href="#">Electrolysis</a></p>

Term →	Term 1a	Term 1b	Term 2a	Term 2b	Term 3a	Term 3b
11 combined	◆ 5.4.3 Electrolysis	◆ ◆ 5.3.1 Quantitative chemistry	◆ ◆ 5.4.2 Acids and bases 5.5.1 Equilibrium	Revision		
11 triple	◆ 4.4.3 Electrolysis 4.5.2 Fuel cells	◆ ◆ 4.3.1 Quantitative chemistry	◆ ◆ 4.4.2 Acids and bases 4.5.1 Equilibrium 4.8.1 Chemical analysis	4.8.1 Chemical analysis Revision		
	<p>Here we will revisit and finish off the lengthy topic of electrolysis, including finishing off the required practical.</p> <p>SKILLS AND CONTENT: ionic formulae, naming compounds, reactivity series literacy</p> <p><a href="#">Electrolysis</a> <a href="#">fuel cells (separates only)</a></p>	<p>Learn all about what a mole is (not the furry animal) and how we can use them in chemistry calculations. How much product can you make if you have a certain amount of reactants?</p> <p>SKILLS AND CONTENT: maths for chemistry, significant figures, units, standard form</p> <p><b>BIG question: How do Doctors work out drug dosages?</b></p> <p><a href="#">quant chem combined</a> <a href="#">Quant chem (separates)</a></p>	<p>Re-cap our knowledge of acids and bases from Y8 and Y9. Learn what happens when a reaction can go both forwards and backwards – what if the products can re-make the reactants?!</p> <p>SKILLS AND CONTENT: analysis of data, Le Chatelier, ionic formulae</p> <p><a href="#">Acids, bases and salts</a> <a href="#">Reversible reactions combined</a> <a href="#">Reversible reactions (separates only)</a></p>	<p>Triples will be learning how to identify unknown compounds via chemical tests.</p> <p>Time to go over everything we have learnt since year 9. We will do plenty of exam question practise throughout the year but it will intensify now. We will do some walking-talking-exam walk through (where your teacher shows you exactly how they would answer a question) and get you ready for the final exams.</p>		

Term Year	Term 1a	Term 1b	Term 2a	Term 2b	Term 3a	Term 3b
12 Organic physical	3.1.2 Amount of substance	3.3.1 Introduction to organic chemistry 3.3.2 Alkanes	3.3.3 Haloalkanes 3.3.4 Alkenes	3.3.5 Alcohols 3.3.6 Organic analysis	3.1.6 Equilibria	Y13 content introduction
12 Inorganic physical	3.1.1 Atomic structure 3.1.3 Bonding	3.1.7 Oxidation, reduction and redox	3.2.1 Periodicity 3.2.2. Group 2 3.2.3 Group 7	3.1.4 Energetics	3.1.5 Kinetics	Y13 content introduction
13 Organic	3.3.15 NMR spectroscopy 3.2.4 Properties of period 3 oxides 3.2.4 Aldehydes and ketones	3.3.9 Carboxylic acids and derivatives 3.3.10 Aromatic chemistry 3.3.11 Amines	3.3.16 Chromatography 3.3.12 Polymers 3.3.13 Amino acids, proteins and DNA	3.1.14 Organic synthesis 3.2.6 Reactions of ions in aqueous solution		
13 Physical	3.3.7 Optical isomerism 3.1.10 Equilibrium constant $K_p$	3.1.9 Rates of reaction 3.1.11 Electrode potentials	3.1.8 Thermodynamics 3.1.12 Acids and bases	3.1.12 Acids and bases 3.2.5 Transition metals		

Key: Science and Chemistry Skills

### **Working scientifically skill development**

- ◆ **Development of scientific thinking** – Gain an understanding of how theories change over time, the importance of the peer review process, and the limitations and ethical issues surrounding scientific advances. Learn how to evaluate risks both in practicals and in wider societal context and use models to make predictions and solve problems.
- ◆ **Experimental skills and strategies** – Learn how to construct a hypothesis, plan and carry out a safe and well-designed experiment, identify variables and be able to make and record observations using a range of apparatus and methods.
- ◆ **Analysis and evaluation** – Develop the skills to present observed data in tables, diagrams and graphs, carry out mathematical analysis of results, identify patterns and trends and make conclusions. Learn how to evaluate data in terms of accuracy, precision, repeatability and reproducibility.
- ◆ **Chemistry concepts** – These topics are core chemistry concepts that are built on continually, that focus on how substances are put together and reactions proceed and can be utilised
- ◆ **Chemistry and the world** – These topics focus on how chemistry impacts the world around us. Providing students with information of how chemistry can impact the environment and economy, as well as the development of materials we use every day.