



## Curriculum Intent

Subject: Science  
Year 9

	What?	Why?	National Curriculum Links
Term 1-1	<b>B1 Cell biology</b> – draw and label animal, plant, bacterial, fungi cells, function of organelles, specialised cells functions, stages of the cell cycle. How to use a microscope. Calculating magnifications. Diffusion, osmosis, active transport – how they work, where they are used in cells	Fundamental topic that is built on in all other biology topics in some way. Good chance to recap knowledge of cells from Y7 and Y8.	Cell biology Transport systems
	<b>C1 Atomic structure</b> – how separating techniques work – distillation, chromatography, filtration and crystallisation. Structure of the atom. Development of the atomic model. Isotopes and calculating relative atomic masses of isotopes. Electron shells. Group 1 properties and reactions. Group 7 properties and reactions. Group 0 properties.	Basics of all chemistry, other topics build on this. Knowledge from 7C1 and 8C1 is essential.	Atomic structure and the Periodic Table
Term 1-2	<b>P1 Energy</b> – types of energy. Calculating kinetic energy, gravitational potential energy, power, work done, efficiency, elastic energy, specific heat capacity. What is thermal conductivity. Names of and advantages and disadvantages of renewable and non-renewable energy sources.	Basics of all physics, other topics build on this. There are around 20 physics equations to learn and be able to use in the GCSEs, this topic introduces 7 of these.	Energy The structure of matter
	<b>B2 Organisation</b> – function of organs in the digestive system. How enzymes work. Factors that affect enzyme action. Food tests – starch, sugar, protein, fat. Structure of the blood, heart and blood vessels.	Recaps many topics from KS3 – 7B1, 7B3, 8B1, 8B2. Lots of new content here too, eg. Food tests. Large topic that requires plenty of recap as we go through it.	Transport systems Photosynthesis



	Health issues – smoking, cancer, CHD. Causes and ways to limit. Plant organs and tissues – xylem, phloem. Transpiration and factors that affect transpiration.		
Term 2-1	<b>C2 Structure &amp; bonding</b> – states of matter, particle diagrams. Ions & ionic bonding – what, how, why. Properties of ionic compounds. Naming ionic compounds. Covalent bonding – what, how, why. Simple and giant covalent structures – properties. Allotropes of carbon – properties. Structure and properties of metals. Problems with bonding models.	Essential knowledge for GCSE. Builds on knowledge from 7C1 and 8C1. Knowledge from this topic will make understanding later chemistry topics much easier, so this needs to be done quite early on in the course.	Structure, bonding and the properties of matter
	<b>P2 Electricity</b> – series and parallel circuits, building/drawing – rules for current and voltage. Calculating current, voltage, resistance, charge, energy, power. Using physics equations. Using components – LDR, thermistors. Electrical safety – plugs, fuses. National Grid	Introduces more equations that are essential for GCSE. Builds on 7P2 and 8P5.	Electricity
Term 2-2	<b>B3 Infection &amp; response</b> – communicable and non-communicable disease, Pathogens and diseases they cause. Physical and chemical barriers of the body. The immune system – antigens, antibodies. Antibiotics and the development of new drugs.	Recaps from KS3 and B1 and B2.	Health, disease and the development of medicines
	<b>C3 Quantitative chemistry</b> – calculating relative formula mass, calculating moles, conservation of mass in calculations, calculating concentration, converting units. Calculating number of atoms	Maths skills, recaps periodic table use, recognising formulas, balancing equations – content in both chemistry papers.	Determination of empirical formulae from the ratio of atoms of different kinds  Quantitative interpretation of balanced equations



Term 3-1	<b>C4 Chemical changes</b> – what is electrolysis, products of electrolysis, half equations, reactivity series, oxidation and reduction equations. Ores and products obtained from ores. Acids, alkalis – names, pH scale, reactions. Naming salts. Equations with acid and alkali. Core practical – making copper sulfate crystals. Carbonates and acid – reactions, products. Metals and acids – reactions, products. Word and symbol equations for all these reactions, balancing equations, using state symbols.	Builds on lots of topics from Y7 and Y8. Quite a large topic so needs to be learned slowly and carefully, with lots of recapping. Plenty of scope for practical work in the labs.	Chemical changes  Energy changes in chemistry
	<b>P3 Particle model</b> – Particle diagrams. Density, displacement cans to calculate density, changes of state graphs, calculating energy in change of state. How gas temperature and pressure are linked.	More physics equations. Builds on knowledge from 7C1 and 7P1.	The structure of matter
Term 3-2	<b>B4 Bioenergetics</b> – photosynthesis equation, factors that affect photosynthesis, investigating photosynthesis core practical, aerobic respiration, equation for respiration, anaerobic respiration. Metabolism – what, why.	Recaps from KS3 and builds on the GCSE topic B1 and B2, so needs to be done after those topics.	The importance of cellular respiration; the processes of aerobic and anaerobic respiration  Photosynthesis
	<b>P4 Atomic structure</b> – atomic models, structure of the atom, electron configuration, alpha, beta, gamma radiation – properties, uses and dangers. How to calculate half life. Using half life graphs. Radioactive decay equations – alpha, beta minus.	Cross over with chemistry topics Recaps previous topics	Atomic structure
	<b>C5 Energy changes</b> – Exothermic and endothermic reactions, examples of. Energy diagrams for endo and exo reactions. Calculating bond energy changes in reactions.	Maths in chemistry, this topic is better completed after having completed C4.	Energy changes in chemistry