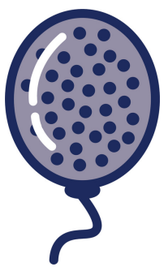
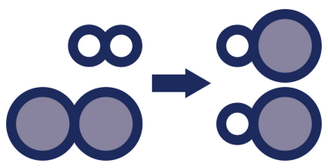
Biology Curriculum Map

Science Mastery

Big Idea	Year 7	Year 8	Year 9	Year 10	Year 11
				Pilot testing in schools '22-'23	
	The fundamental knowledge underpinning each of the three science disciplines is introduced in Y7 and Y8		All knowledge required to be successful at GCSE is explicitly taught in Y9-11, building in depth if previously introduced at KS3		
Cells are Alive 	**B1.1 Cells** • Cell structure • Cell specialisation • Using microscopes • Principles of organisation		**B3.1 Growth and differentiation** • Eukaryotic and prokaryotic cell structure • Microscopes • Cell transport • Cell division (mitosis) • Stem cells and cell differentiation		
Bodies are Systems 		**B2.1 Tissues and Organs** • The musculoskeletal system • The breathing system • Drugs • Plant structure **B2.4 Nutrition** • Digestion • Digestive enzymes • Food tests • A balanced diet • Plant nutrition		**B4.1 The Digestive System** • The digestive system • Mechanical and chemical digestion • Food tests • Digestive enzymes • Factors affecting enzyme activity **B4.2 Circulation and Respiration** • Structure of the lungs • The circulatory system • Blood vessels • Coronary heart disease • Aerobic and anaerobic respiration • Metabolism and response to exercise **B4.4 Health and Disease** • Correlation, causation and risk factors • Communicable disease • Human defence systems • Microorganisms • Monoclonal antibodies	**B5.1 Feedback and Control** • Structure of the nervous system • The Reflex Arc • Reaction Time • The Brain • The Eye • Homeostasis and the endocrine system • Blood glucose and osmosis • Water and nitrogen balance • Plant hormones
Characteristics are Inherited 	**B1.2 Reproduction** • Sexual and asexual reproduction • Puberty • The menstrual cycle • Embryo development • Plant reproduction		**B3.3 Genetics** • Sexual and asexual reproduction • Cell division (meiosis) • DNA, genes and chromosomes • Inheritance • Coding for proteins		**B5.2 Controlling Reproduction** • Sexual and Asexual reproduction • Reproductive hormones • Hormonal control of the menstrual cycle • Contraception • Fertility treatment
Organisms are Interdependent 	**B1.3 Interdependence** • Ecosystems • Sampling • Food chains and webs • Competition for resources		**B3.2 Human Interaction** • Biodiversity • Pollution • Pyramids of biomass • Food security	**B4.5 Ecology** • Organisation of an Ecosystem • Biotic and abiotic factors • Food chains and webs • Predator-prey relationships • Investigating species distribution • Impact of environmental change • Farming, biotech and food security	
Ecosystems Cycle Resources 		**B2.2 Respiration and Photosynthesis** • Respiration and exercise • Fermentation • Photosynthesis • Plant adaptations • Biomes		**B4.3 Plants and Material Cycling** • Transpiration • Translocation • Plant structure • Photosynthesis • Limiting factors • Material cycling	
Species Show Variation 		**B2.3 Life Diversity** • Variation • Selective breeding • Adaptation			**B5.3 Controlling Nature** • Genetic engineering • Cloning • Inherited diseases • Therapeutic cloning **B5.4 Evolution** • DNA and proteins • Natural selection and evolution • Fossils and extinction • Classification

Chemistry Curriculum Map

Science Mastery

Big Idea	Year 7	Year 8	Year 9	Year 10	Year 11
				Pilot testing in schools '22-'23	
	The fundamental knowledge underpinning each of the three science disciplines is introduced in Y7 and Y8		All knowledge required to be successful at GCSE is explicitly taught in Y9-11, building in depth if previously introduced at KS3		
Structure determines properties 	**C1.1 Particles** • States of matter • The particle model • Changing states • Diffusion • Gas pressure • Density **C1.2 Elements, Atoms and Compounds** • Atoms and elements • The periodic table • Metals and non-metals • Compounds and mixtures • Hazards in the lab **C1.3 Mixtures** • Pure substances and mixtures • Solutions • Separation techniques		**C3.1 The Periodic Table** • Atoms, elements and compounds • Atomic structure • Electronic configuration • Isotopes • The atomic model • The periodic table	**C4.1 Structure and Bonding** • Types of bonding • Properties of ionic, covalent and metallic substances • Diamond and Graphite • Graphene and Fullerenes • Nanotubes • Polymers	**C5.1 Carbon Chemistry** • Crude oil and hydrocarbons • Fractional distillation • Combustion of hydrocarbons • Cracking • Alkenes • Alcohols • Carboxylic acids • Addition polymerisation • Condensation polymerisation • Naturally occuring polymers
Reactions rearrange matter 		**C2.2 Changing Substances** • Chemical and physical changes • Chemical equations and the law of conservation of mass • Chemical reactions • Tests for gases **C2.1 Acids and Alkalis** • Acids and alkalis • Indicators • Word equations • Reactions of acids and alkalis	**C3.2 Introduction to Quantitative Chemistry** • Chemical reactions and equations • Relative atomic and formula mass • Introducing concentration • Making soluble salts	**C4.2 Extraction of Metals** • The reactivity series • Ionic equations • Writing half equations • Extraction of metals • Electrolysis • Corrosion and its prevention • Recycling metals **C4.3 Quantitative Chemistry** • Atom economy and % yield • Calculating moles • Concentration • Amounts of substances in equations • Acids, alkalis and neutralisation • Titrations • Strong and weak acids • Volumes of gases **C4.4 Energy Changes** • Energy in chemical reactions • Exothermic and endothermic reactions • Bond energies • Investigating temperature changes • Cells and batteries	**C5.2 Controlling Reactions** • Collision theory and activation energy • The effect of changing temperature, concentration, surface area and pressure • Catalysts • Measuring rate of reaction • Reversible reactions • Le Chatelier's Principle **C5.4 Chemical Analysis** • Pure substance and formulations • Distillation • Chromatography • Tests for gases • Identifying metal ions • Instrumental methods of analysis
Earth systems interact		**C2.3 Earth Systems** • The structure and composition of the Earth • Types of rock • The water cycle • Burning fuels	**C3.3 Using Resources** • Potable water • Testing water • Using Earth's resources • Reduce, reuse, recycle • Life Cycle Assessment • Evaluating impact • Sources of information		**C5.3 Our Atmosphere** • Earth's early atmosphere • The greenhouse effect and climate change • Carbon footprints • Combustion and atmospheric pollution • Reducing pollution and renewable energy

Physics Curriculum Map

Science Mastery

Big Idea	Year 7	Year 8	Year 9	Year 10	Year 11
				Pilot testing in schools '22-'23	
	The fundamental knowledge underpinning each of the three science disciplines is introduced in Y7 and Y8		All knowledge required to be successful at GCSE is explicitly taught in Y9-11, building in depth if previously introduced at KS3		
Forces predict motion 	**P1.1 Contact Forces** • Forces • Resultant forces • Effects of forces	**P2.1 Movement and Pressure** • Speed • Distance-time graphs • Pressure	**P3.1 Acceleration** • Speed • Scalars and vectors • Newton's First and Third Laws • Acceleration • Velocity-Time graphs	**P4.3 Movement** • Work done • Moments, levers and gears • Newton's Second Law • Stopping distances • Momentum	
Fields produce forces 	**P1.2 Space** • Gravitational force • Weight • The Solar System	**P2.2 Magnetism** • Magnetism • Electromagnets			**P5.2 Force Fields** • Magnetism • Electromagnetism • Space physics • Electric fields
Energy is conserved 	**P1.3 Energy Transfers** • Energy stores • Energy transfers • Thermal energy and transfers		**P3.2 Heating** • Internal energy • Thermal transfer • Specific heat capacity • Specific latent heat	**P4.1 Matter** • Density • Pressure **P4.2 Energy Conservation** • Energy in systems • Specific heat capacity • Power • Energy resources	
Electricity transfers energy 	**P1.4 Electric Circuits: Current and Voltage** • Electric circuits • Current • Voltage	**P2.3 Electric Circuits: Resistance** • Resistance • Ohm's Law • Resistance in series and parallel circuits	**P3.4 Home Electricity** • Mains electricity • Power in appliances • The National Grid • Energy resources • Static electricity	**P4.4 Electric Circuits and Energy** • Current, voltage and resistance • Circuit components • Induced potential and transformers	
Radiation transfers energy 		**P2.4 Light** • Properties of light • Reflection • Refraction • Light and colour	**P3.3 Sound and Waves** • Properties of waves • Sound and ultrasound • Reflection and refraction • Technological use of waves	**P4.5 Radioactivity** • Radioactive decay • Contamination and irradiation • Background radiation • Nuclear fission and fusion	**P5.1 Electromagnetic Radiation** • Electromagnetic waves • Lenses • Visible light • Black-body radiation • Red shift