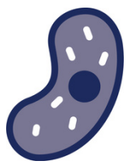
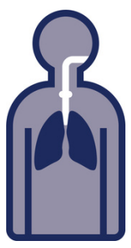
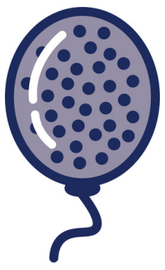
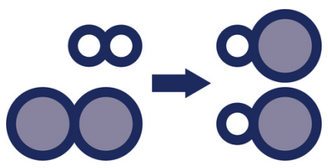
Biology Curriculum Map

Science Mastery

Big Idea	Year 7	Year 8	Year 9	Year 10	Year 11
	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 • Artificial selection • Natural selection • Evolution			**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

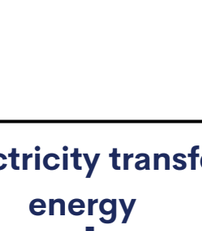
Chemistry Curriculum Map

Science Mastery

Big Idea	Year 7	Year 8	Year 9	Year 10	Year 11
	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 		**C2.1 Acids and Alkalis** • Acids and alkalis • Indicators • Word equations • Reactions of acids and alkalis **C2.2 Changing Substances** • Chemical and physical changes • Chemical equations and the law of conservation of mass • Chemical reactions • Tests for gases	**C3.2 Introduction to Quantitative Chemistry** • Chemical reactions and equations • Balancing equations • Percentage by mass • 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
	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** • Terminal velocity • Newton's Second Law • Stopping distances • Momentum • Work done • Hooke's Law • Moments, levers and gears	
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** • The particle model • Density • Pressure in fluids **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 • Investigating resistance • Circuit components • Energy transfers in circuits	
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	**P5.1 Electromagnetic Radiation** • Electromagnetic waves • Lenses • Visible light • Black-body radiation • Red shift