THE BIG IDEAS IN SCIENCE

Year 7
Year 8
Year 9
Year 10
Year 11

You will revisit 10 key areas of science to build upon knowdledge and understanding throughout your time at Malbank

		Big Idea															
1	Physics	Forces 	Speed	Gravity	Contact forces	Pressure	Particle model and pressure	Pressure and pressure differences in fluids (physics only	Hazards and uses of radioactive emissions and of background radiation (physics only)	Nuclear fission and fusion (physics only)	Forces and their interactions	Forces and elasticity	Forces and motion	Momentum (HT only)	Moments, levers and gears (physics only)			
2		Electromagnet 	Voltage & Resistance	Current	Electromagnets	Magnetism	Current, potential difference and resistance	Series and parallel circuits	Domestic uses and safety	Static electricity (physics only)	Permanent and induced magnetism, magnetic forces and fields	Induced potential, transformers and the National Grid (physics only)						
3		Energy 	Energy costs	Energy transfer	Work	Heating and cooling	Energy stores and systems	Conservation and dissipation of energy	National and global energy resources	Changes of state and the particle model	Atoms and isotopes	Atoms and nuclear radiation	Internal energy and energy transfers	Energy transfers	Work done and energy transfer			
4		Waves 	Sound	Light	Wave effects	Wave properties	Waves in air, fluids and solids	Electromagnetic waves	Space	Black body radiation (physics only)	Solar system; stability of orbital motions; satellites (physics only)	Red-shift (physics only)						
5	Chemistry	Matter 	Particle model	Separating mixtures	Periodic table	Elements	The atom, symbols, relative atomic mass, electronic charge and isotopes	The periodic table	Structure and bonding of carbon	Chemical measurements, conservation of mass and the quantitative interpretation of chemical equations - Explain the meaning	Use of amount of substance in relation to masses of pure substances (HT)	Yield and atom economy of chemical reactions (chemistry only)	Using concentrations of solutions in mol/dm3 (chemistry only)	Use of amount of substance in relation to volumes of gases	Purity, formulations and chromatography			
6		Reactions 	Metal and non metals	Acids and alkalis	Chemical energy	Exothermic and endothermic reactions	Chemical cells and fuel cells (chemistry only)	Rate of reaction	Reversible reactions and dynamic equilibrium	Chemical bonds, ionic, covalent and metallic	How bonding and structure are related to the properties of substances -	Bulk and surface properties of matter including nanoparticles (chemistry only)	Reactivity of metals	Reactions of acids	Electrolysis	Properties of transition metals -	Identification of common gases	Identification of ions by chemical and spectroscopic means
7		Earth 	Earth structure	Universe	Climate	The composition and evolution of the Earth's atmosphere	Carbon dioxide and methane as greenhouse gases	Common atmospheric pollutants and their sources	Using the Earth's resources and obtaining potable water	Earth's resources	Life cycle assessment and recycling	Using materials (chemistry only)	Carbon compounds as fuels and feedstock	Types of reactions	Reactions of alkenes and alcohols (chemistry only)	Synthetic and naturally occurring polymers (chemistry only)	The Haber process and the use of NPK fertilisers (chemistry only)	
8	Biology	Organisms 	Movement	Cells	Breathing	Digestion	Adaptations, Interdependence and Competition	Classification of living organisms	Cell Structure	Disease	Organisation and the digestive system	Organising Animals	Non-Communicable Diseases stasis	Organising Plants	Photosynthesis	Respiration		
9		Ecosystems 	Interdependence	Plant reproduction	Respiration	Organisation of an Ecosystem	Biodiversity and the Effect of Human Interaction on Ecosystems											
10		Genes 	Variation	Human reproduction	Evolution	Cell Division	Reproduction	Variation and Evolution	Genetics and Evolution									