Science Department Programme of study (Combined Science: Physics): Overview

	Year 7	Year 8	Year 9	Year 10	Year 11
Phase 1			**CONSERVATION OF ENERGY** How energy is stored and transferred How to represent energy transfer diagrams How to calculate efficiency How to reduce transfers of wasted energy How to calculate the amount of GPE or KE stored in objects Evaluate the different renewable and non-renewable resources we use to make electricity for heating, cooking and for transport	**EM SPECTRUM** Refraction core practical **ENERGY - FORCES DOING WORK** The effects of balanced and unbalanced forces How the energy in a system can be changed How to calculate the power and work done How objects interact with each other, through force fields and contact forces How to use vector diagrams to work out the effects of forces on an object	**PARTICLE MODEL 2** How changing the temperature of a gas affects its pressure and how to calculate temperatures and pressures **EM INDUCTION** How to use the power equation for transformers How transformers are used in the national grid How a current is induced in a wire and the factors which affect it How a transformer works
Phase 2			**PARTICLE MODEL 1** The properties of solids, liquids and gases. How particles and arranged in solids, liquids and gases How to explain different densities of substances and how to calculate density How to measure the specific heat capacity and the Latent heat of a substance	**MOTION** The difference between vector and scalar quantities How to calculate speed and acceleration To represent journeys on distance/time and velocity/time graphs How to use graphs to calculate speed, acceleration and distance travelled **MOTION AND FORCES** About Newton's laws of motion How to calculate the weight of an object from its mass The factors affecting the stopping distance of a vehicle About the dangers of large decelerations How to calculate momentum, and apply ideas about momentum to collisions	**RADIOACTIVITY** How the particles inside atoms are arranged How the theory of the Bohr atom was developed How to represent atoms using symbols About the different types of radiation and how they affect atoms About the background radiation that is all around us How radiation is detected The uses of radioactivity in the home and industry About the dangers of radiation and how we can protect ourselves, half-life **REVISION** (Cont. Phase 3
Phase 3			**WAVES 1** How to describe Transverse and Longitudinal waves That waves transfer energy and information without transferring matter How to describe the characteristics of waves How the speed of a wave is related to its frequency and wavelength, and to the time it takes to travel a certain distance How sound waves are produced How sound is used in echo location **EM SPECTRUM** (Cont. Phase 4) That light is part of a family of waves called the electromagnetic spectrum, which all have some properties in common Some of the uses of waves in the different parts of the EM spectrum Some of the harmful effects of waves in different parts of the EM spectrum About some of the factors that affect the temperature of the Earth	**ELECTRICITY – TRANSFERRING ENERGY** About the UK domestic electricity supply and electrical safety features in homes How earthing works and why it is important **MAGNETS AND MAGNETIC FIELDS** About permanent and induced magnets, and how to represent a magnetic field About the magnetic field around a current in a wire and the factors that affect it How the fields from the individual coils in a solenoid interact How to work out the size and direction of the force on a wire carrying a current in a magnetic field	**REVISION** (Cont. Phase 4)

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Phase 4			**ELECTRICITY AND CIRCUITS** Current, Charge and Potential difference Series and parallel circuits How to calculate resistance, power and energy transferred The components which have changing resistance	**FORCES AND MATTER** About elastic and inelastic distortion The relationship between force and extension, and how to calculate the extension and spring constant How to calculate the work done when stretching a spring	**STUDY LEAVE**
	END OF YEAR EXAM	**END OF YEAR EXAM**	**END OF YEAR EXAM**		