SCHEME OF WORK

	A-LEVEL YEAR 1		
Week	**Major Teacher**	**Minor Teacher**	**Assessment**
Start of term/L6 Enrolment			
L6 Enrolment			
1	**3.4.2 Materials** Density	**3.1.1 Use of SI units and their prefixes** Introduction to A/AS level physics; Quantities and Units; number work; Standard form; Prefixes; significant figures	
2	Springs and Elastics: Hooke's law Elastic strain energy, Energy Stored.	**3.4.1 Mechanics** Motion along a straight line. Displacement, speed, velocity and acceleration. (Quantities and Units; number work; Standard form; Prefixes; significant figures)	
3	Description of plastic behaviour, fracture and brittleness; interpretation of simple stress-strain curves. breaking stress. The Young modulus Use of stress-strain graphs to find the Young modulus	Representation by graphical methods of uniform and non-uniform acceleration, interpretation of velocity-time and displacement-time graphs for uniform and non uniform acceleration, significance of areas and gradients.	
4	Application of Young modulus	Equations for uniform acceleration Acceleration due to gravity, g	
5	**3.3.1 Waves** Progressive Waves. amplitude, frequency, wavelength, speed, phase, path difference. $c = f\lambda$ Longitudinal and transverse waves. Polarisation	Projectile motion Scalars and vectors The addition of vectors by calculation or scale drawing. The resolution of vectors into two components at right angles to each other. Projectile motion - Independence of vertical and horizontal motion.	
6	Characteristics, including sound and electromagnetic waves, reflection and diffraction	Projectile motion Practise	*Half term test: result for BM1*

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Half Term - 25thth – 29th October			
7	Refraction at a plane surface. Snell's Law	Newton's laws of motion Knowledge and application of the three laws of motion in appropriate situations. Terminal speed.	
8	Refractive index, total internal reflection, critical angle.	Moment of a force about a point, couples and torque.	**Benchmark 1**
9	Fibre optics – step index fibres, application to communications.	The principle of moments and its applications in simple balanced situations. Centre of mass.	
10	Principle of superposition Stationary waves, formation from two travelling waves, nodes and antinodes.	The resolution of vectors into two components at right angles to each other.	
11	Application of stationary waves and music	Conditions for equilibrium for two or three coplanar forces acting at a point.	
12	Interference, the concept of path difference and coherence, the laser as a source of coherent monochromatic light	Static forces practice	
13	Double-slit systems, fringe spacing	Static forces practice	*Half term test: result for BM2*
Christmas Holiday - 21st December – 2nd January			
14	Diffraction, appearance of the diffraction pattern from a single slit	F = ma for constant mass, Momentum,	
15	Diffraction grating, applications – spectral analysis of light from stars.	Force as the rate of change of momentum, Impulse = change in momentum,	**Benchmark 2**
16	**1.5.1 Current Electricity** Charge & Current	Work, energy and power. Efficiency.	**Student Review 1 Available**
17	Potential difference. & Resistance. Ohm's law	Conservation of energy – applied to examples involving gravitational potential energy, kinetic energy and work done against resistive forces	
18	Current / voltage characteristics; Ohmic conductor, semiconductor diode and filament lamp.	**3.2.2 Electromagnetic Radiation and Quantum Phenomena** The photoelectric effect. Work function, threshold frequency, photoelectric equation.	

19	Resistivity. Effect of temperature on the resistance of metal conductors and thermistors, temperature sensors. Superconductivity and applications	Collisions of electrons with atoms.	*Half term test: result for BM3*
Half Term - 14th February – 18th February			
20	Circuits.	The electron volt, ionisation and excitation, the fluorescent tube. Energy levels and photon emission. Line spectra.	
21	Resistors in series and parallel.	Wave-particle duality. Electron diffraction, the de Broglie wavelength.	
22	Conservation of charge and energy in simple dc circuits. Kirchoff's	Quantum Practice	
23	Energy and Power.	**3.2.1 Particles** Constituents of the atom. Proton, neutron, electron. Proton number Z, nucleon number A, nuclide notation, isotopes.	
24	The potential divider Use with variable resistors, thermistors and LDRs	Stable and unstable nuclei. The strong nuclear force; its role in keeping the nucleus stable; Equations for alpha decay and β- decay including the neutrino.	**Benchmark 3**
25	Electromotive force and internal resistance. Applications.	Particles, antiparticles and photons. Comparison of particle and antiparticle masses, charge and rest energy in MeV. Annihilation and pair production. Photon model of electromagnetic radiation, the Planck constant.	
Easter Holiday – 4th April – 15th April			
26	General Elec Problem solving	Particle interactions. Exchange particles; virtual photons, W+ and W- particles. Feynman diagrams	
27	**3.7.5.5 Alternating currents** Sinusoidal voltages and currents, root mean square, peak and peak-to-peak values.	Classification of particles Hadrons: baryons and mesons. Leptons: electron, muon, neutrino. Quarks and antiquarks.	

28	The oscilloscope. Use of an oscilloscope as a dc and ac voltmeter, to measure time intervals and frequencies and to display ac waveforms	Up (u), down (d) and strange (s) quarks. Combinations of quarks and antiquarks. Application of conservation laws to particle interactions. Strangeness. Change of quark character in β- and β+ decay..	
29	**Consolidation Revision & Practice**	**Consolidation Revision & Practice**	
30	**ARG Assessment**	**ARG Assessment**	
31	**Assessment Review**	**Assessment Review**	
Half Term 30th May – 3rd June			
32	**3.6.1.1 Circular Motion** Angular speed	**3.6.2 Thermal Physics** Internal energy and temperature, Temperature scales,	
33	Centripetal Acceleration.	Specific heat capacity,	**Benchmark 4**
34	Centripetal force,	Change of state, Latent heat.	
35	Applications	Combined thermodynamic problems	
36	Consolidation Revision & Practice	Consolidation Revision & Practice	
37			**Student Review 2 and Predicted Grade Available**