

KS4 Curriculum Plan 2022-23

		LP1	LP2	LP3	LP4	LP5
Year 10	TOPIC	Energy	Electricity	Electricity in the home	Molecules and matter	Radioactivity
	Knowledge	Energy stores and transfers. Conservation of energy. Specific Heat Capacity. Conduction. Convection. Kinetic, gravitational potential, elastic potential energy and work done. Calculating efficiency. Renewable and non-renewable energy resources.	Static electricity and electric fields. Circuit symbols and circuit diagrams. Current as the rate of flow of charge. Using the equation $Q=It$. Current and potential difference in series and parallel circuits. Resistance. Calculating resistance using $V=IR$. Resistors in series and parallel. IV graphs for resistors, lamps and diodes. Behaviour of thermistors and LDRs.	A.c. and d.c. circuits. Mains electricity, wiring a plug and electrical safety. Use of equations $P=IV$, $P=I^2R$, $E=QV$ and $E=Pt$. The National Grid.	Particles in solids, liquids and gases. Changes of state. Calculating density. Measuring density of regular and irregular objects. The difference between heat and temperature. Explaining changes in the energy of particles during heating and cooling. Latent heat. Kinetic theory and particles in gases. Relationship between pressure and volume. Pressure at different depths in a fluid.	Structure of the atom. Mass number and atomic number. Isotopes. How the model of the atom has changed over time. Radioactive decay. Alpha, beta and gamma radiation. Decay equations. The nature of radioactive decay. Half life and activity. Contamination and irradiation. Risks of radioactivity and precautions taken. Nuclear fission and fusion.
	Skills	Standard form (MS) Unit conversions (MS) Rearranging equations (MS) Taking accurate measurements. Determining gradients (MS) Standard form (MS) Unit conversions (MS) Rearranging equations (MS) Constructing and analysing circuits. Taking accurate measurements. Determining gradients (MS) Sketching graphs. Standard form (MS) Unit conversions (MS) Rearranging equations (MS) Reading oscilloscope traces. Sketching graphs. Standard form (MS) Unit conversions (MS) including conversion from cm^3 to m^3 . Taking accurate measurements. Correct use of significant figures. Rearranging equations (MS) Determining gradients (MS) Sketching graphs. Sketching graphs. Interpreting graphs. Calculating half-life from decay curves. Calculating activity.				
Key Vocab	Energy, joule, kinetic, potential, gravitational, elastic, efficiency, renewable, non-renewable, conservation.	Current, charge, potential difference, resistance, ampere, coulomb, volt, ohm, thermistor, diode, dependent.	Alternating, oscillation, frequency, direct, power, watts, hertz, transformer, fuse.	Particles, state, density, regular, irregular, displacement, volume, mass, heat, temperature, specific heat, latent heat, kinetic, internal, potential.	Decay, mass, atomic, radioactive, alpha, beta, gamma, nucleus, proton, neutron, electron, half-life, random, spontaneous, activity.	
Year 11	TOPIC	Forces	Forces	Waves	Electromagnetism	
	Knowledge	Vectors and scalars. Resolving forces into vertical and horizontal components. Scale diagrams. Distance-time graphs. Velocity-time graphs. Acceleration. Calculating acceleration.	Newton's laws. Weight and gravity. Terminal velocity. Forces and breaking. Momentum. Conservation of momentum. Collisions and explosions. Forces and elasticity. Hooke's Law	Wave diagrams. Wavelength, frequency and amplitude. Transverse and longitudinal waves. The wave equation. Reflection, absorption and refraction. Ray diagrams. The uses and dangers of the electromagnetic spectrum.	Magnetic fields. Right hand grip rule and magnetic field around a current carrying conductor. Fleming's Left Hand Rule. Application of the equation $F=BIL$. How a motor works (using the left hand rule).	
	Skills	Calculating gradients. Finding the tangent to a curve. Scale vector diagrams. Rearranging and applying equations. Unit conversions. Rearranging and applying equations. Unit conversions. Calculating gradients. Applying the equation of a line to scientific investigations. Rearranging and applying equations. Unit conversions. Ray diagrams. Accurate measurement of angles using a protractor. Rearranging and applying equations. Unit conversions.				
Key Vocab	Vector, scalar, distance, displacement, speed, velocity, resultant, component, resolve, acceleration.	Gravitational field strength, acceleration, terminal, resistance, drag, elastic, inelastic, proportionality, plastic, deformation, permanent, conservation.	Electromagnetic, radio, microwave, infrared, visible, ultraviolet, x-ray, gamma, ionising, radiation, reflection, refraction, absorption, transmission, refraction, transverse, longitudinal, amplitude, frequency, wavelength, period.	Current, magnetic flux density, induction, permanent, induced, magnetised, generator, motor, transformer.		