

SUBJECT: Separates Physics



NESTON HIGH SCHOOL

KS4 CURRICULUM PLAN

KS4 Knowledge and key skills

YEAR 10	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
TOPIC	<i>Energy</i>	<i>Electricity</i>	<i>Forces</i>	<i>Forces</i>	<i>Forces</i>	<i>Waves</i>
Knowledge	Energy stores and systems, Changes in energy, specific heat capacity, Power, Conservation and dissipation of energy. Calculate and describe ways to increase the efficiency of an intended energy transfer. National and global energy resources; Renewable and non-renewable.	Describe the production of static electricity and electric fields. Standard circuit component symbols. Define and calculate Current, resistance and potential difference. Know Voltage - current graphs for various components and how resistance changes in sensor circuits. describe the difference between series and parallel circuits Explain qualitatively why adding resistors in series increases the total resistance whilst adding resistors in parallel decreases the total resistance. Domestic electricity uses and safety, including plugs. Mains electricity. Understand electricia power. The National Grid	Speed. Distance–time graphs. Velocity–time graphs. Acceleration. Scalar and vector quantities. Contact and non-contact forces. Gravity, weight and mass. Resultant forces. Resolving forces.	Forces and acceleration. Inertia. Investigating the acceleration of an object- required practical. Newton’s third law. Momentum. Keeping safe on the road. Fcators affecting stopping distance. Paper 1 revision towards post Easter exam week.	Moments, levers and gears. Forces and elasticity. Elastic potential energy. Atmospheric pressure. Pressure in fluids, upthrust.	Describing waves. Transverse and longitudinal waves. Measuring wave speeds. Measuring the wavelength, frequency and speed of waves in a ripple tank and waves in a solid - required practical. Reflection, refraction and wave fronts. Investigate the reflection of light by different types of surface and the refraction of light by different substances - required practical.
Skills	Calculate the amount of energy associated with a moving object, a stretched spring and an object raised above ground level. Calculate the amount of energy stored in or released from a system as its temperature changes. Calculate efficiency. Describe the main energy sources available distinguish between energy resources that are renewable. energy resources that are non-renewable	Draw Circuit diagrams using standard symbols. Calculate current, resistance and potential difference from formulae. Build a circuit to measure the resistance of a component by measuring the current through, and potential difference across, the component. Calculate electrical power	Draw and interpret graphs, calculate gradients and area. Calculate weight. Draw free body diagrams. Draw vector diagrams to find resultant forces. Resolve a force into its components at right angles to each other.	Investigate Force, mass and acceleration practicaly. Calculate momentum, apply the conservation of momentum to collision situations. Apply the rate of change of momentum to car safety and other impact situations.	Calculate the moment of a force about a pivot. Calculate a spring constant in linear cases. calculate work done in stretching (or compressing) a spring. Calculate pressure at different heights in a fluid. Understand how changing pressure with depth results in upthrust.	Recognise different properties of waves, measure wave speed practically, calculate waves speed, wavelength and frequency and time period from formulae.
Key Vocab	Gravitational, Elastic, Kinetic, power, Efficiency, Renewable.	Electricity, Current, Potential difference (voltage), resistance. Parallel, Transformers	Acceleration, scalar, vector, speed, velocity, distance, displacement. Resultant.	Momentum, Conservation, Impact. Braking, stopping and thinking distance.	Atmospheric, pressure, upthrust, compression, extension, moment.	Transverse, longitudinal, reflection, refraction, wavelength, frequency,

Key Knowledge Transfer

YEAR 11	SUMMER 2	SUMMER 1	SPRING 2	SPRING 1	AUTUMN 2	AUTUMN 1
TOPIC	<i>Revision/External examinations</i>	<i>Revision/External examinations</i>	<i>Revision/ review</i>	<i>Space</i>	<i>Electromagnetism</i>	<i>Waves</i>
Knowledge	Examinations	Revise the unit 2 topics - Forces, Waves, Magnetism and Electromagnetism. Revisit all required practicals	Revise the unit 1 topics Atomic Structure and the Particle model of matter from year 9. Revisit all required practicals	The solar system. Satellites. The star cycle. How elements are formed. Red Shift. The expanding universe and the big bang.	Magnetism and magnetic forces. Compasses and magnetic fields. The magnetic effect of a solenoid. Calculating the force on a conductor. Motors. Electromagnets in action. Relay, electric bell, Loudspeaker. The generator effect. Using the generator effect. Transformers	Sound waves. Ultrasound. Seismic waves. The electromagnetic spectrum. Properties and uses of electromagnetic waves. Radio and microwave communication. Infrared radiation and surfaces. Earths radiation budget. Colour. Lenses. Images and magnification
Skills	Answering : Long-answer questions, Mathematical skills, and Required Practicals.	Answering : Long-answer questions, Mathematical skills, and Required Practicals.	Answering : Long-answer questions, Mathematical skills, and Required Practicals.	Describe the orbits of planets and moons in the Solar System. Compare the orbital motion of moons, artificial satellites and planets in the Solar System. Describe the main sequence stage of a star’s life cycle. Understand how new elements are produced by nuclear fusion inside a star. Describe red shift as evidence for the expanding Universe	Draw filed around a magnet. Calculate the forse on a current carryin wire from a given formula. Use and apply Flemings left hand rule, and determine the direction of the current in electromagnetic induction.	Draw lense diagrams, describe the image formed. Calculate magnification. Apply the properties of EM waves to their uses.
Key Vocab				Satellite, fusion, sequence, supernova, expanding, universe.	Magnetic, electromagnet, solenoid, induction, conductor, motor, generator.	Seismic, electromagnetic, spectrum, communication, converging, diverging, magnification.