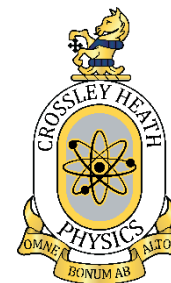


PHYSICS: 7 YEAR CURRICULUM PLAN



Year group		Topic	Core Knowledge	Core Skills
7	Foundations of Physics	Topic 1 – Forces	<ul style="list-style-type: none"> Types of forces Measuring forces. Hooke’s law. Friction and drag Weight and gravity. Balanced and unbalanced forces. 	<ul style="list-style-type: none"> Graph drawing. Drawing labelled force diagrams. Practical work and recording data. Writing a scientific method. Using new scientific terminology. Extended writing to demonstrate knowledge.
		Topic 2 – Space	<ul style="list-style-type: none"> Objects in the universe. Planets in the solar system. Day and night. Seasons. Phases of the moon. 	<ul style="list-style-type: none"> Making models. Graph drawing. Drawing labelled diagrams. Using new scientific terminology. Evaluating data to form conclusions.
		Topic 3 – Energy	<ul style="list-style-type: none"> Energy from food. Energy stores. Conduction, convection, radiation. Renewable energy sources. Non-renewable energy sources Power. 	<ul style="list-style-type: none"> Practical skills including writing a plan of own methods. Research skills. Numeracy skills in power calculations. Using new scientific terminology. Evaluating data to form conclusions.
8	Foundations of Physics	Topic 4 – Sound	<ul style="list-style-type: none"> Waves. Sound through different states of matter. Volume and pitch. Hearing. Ultrasound. 	<ul style="list-style-type: none"> Drawing wave diagrams. Using new scientific terminology. Extended writing to demonstrate knowledge. Modelling of waves.
		Topic 5 – Light	<ul style="list-style-type: none"> Transparent materials. Translucent materials. Opaque materials. Reflection. Refraction. The eye. Colour. 	<ul style="list-style-type: none"> Practical skills including using ray boxes and mirrors. Writing a full scientific write up of an experiment. Drawing labelled ray diagrams Making a model of the eye/camera. Graph drawing. Using new scientific terminology Extended writing to demonstrate knowledge.
		Topic 6 – Electricity & Magnetism	<ul style="list-style-type: none"> Static electricity. Fault spotting. Circuit diagrams. Series circuits and Parallel circuits. Current, Potential difference and Resistance. Magnetism. Electromagnetism. Using electromagnets. 	<ul style="list-style-type: none"> Practical skills including using all the electricity equipment and using magnets Graph drawing. Writing practical methods. Numeracy skills in calculating resistance. Labelled diagrams of magnetic fields. Using new scientific terminology. Extended writing to demonstrate knowledge.

9	Establishing Ideas in Physics	Topic 7 – Motion & Pressure	<ul style="list-style-type: none"> • Speed. • Distance-time graphs. • Gas pressure. • Pressure in liquids. • Floating and sinking. • Pressure in solids. • Hydraulics. • Moments. 	<ul style="list-style-type: none"> • Graph drawing • Lots of opportunities to enhance numeracy skills calculating speed • Pressure • Moments • Using new scientific terminology • Extended writing to demonstrate knowledge.
		Topic 8 – Forces 2	<ul style="list-style-type: none"> • Types of forces. • Measuring forces. • Forces as vectors. • Work done. • Weight and gravity. • Balanced and unbalanced forces. • Hooke’s law. • Resolving forces. 	<ul style="list-style-type: none"> • Graph drawing. • Drawing labelled force diagrams. • Practical work and recording data • Resolving vectors. • Drawing the parallelogram of forces for various situations. • Evaluating forces on objects from force diagrams.
		Topic 9 – Density & Pressure	<ul style="list-style-type: none"> • Calculating density in solids. • States of matter. • Finding density of Liquids and gases. • Pressure in solids, liquids and gases. • Floating and sinking. • Changes in Earth’s atmosphere. 	<ul style="list-style-type: none"> • Graph drawing. • Drawing labelled force diagrams. • Practical work and recording data. • Undertaking required practical activities. • Evaluating data to form conclusions. • Numeracy skills in density and pressure calculations.
		Topic 10 – Energy 2	<ul style="list-style-type: none"> • Energy stores and pathways. • Work done. • Conservation of energy. • Renewable and non-renewable energy resources. 	<ul style="list-style-type: none"> • Practical skills. • Graph drawing. • Research skills. • Numeracy skills in work done calculations. • Using scientific terminology.
		Topic 11 – Space 2	<ul style="list-style-type: none"> • Objects in the universe. • Planets in the solar system. • Day and night. • Seasons. • Phases of the moon. • Stars and their life-cycles. • Nuclear fusion introduction. 	<ul style="list-style-type: none"> • Using scientific models. • Graph drawing. • Numeracy skills in orbital period /speed calculations. • Drawing labelled diagrams • Using new scientific terminology. • Research skills.
		Topic 12 – Mechanics 1	<ul style="list-style-type: none"> • Speed. • Distance-time graphs. • Velocity. • Velocity-time graphs. • Acceleration. 	<ul style="list-style-type: none"> • Practical skills. • Graph drawing. • Research skills. • Numeracy skills in velocity & acceleration calculations.
		Topic 13 – Fields & Electricity	<ul style="list-style-type: none"> • Static Electricity. • Applications of static electricity. • Resistance, current, potential difference. • Series and parallel circuits. 	<ul style="list-style-type: none"> • Practical skills including using all the electricity equipment. • Graph drawing. • Evaluating experimental methods. • Numeracy skills in calculating resistance, current and potential difference.
		Topic 14 – Waves	<ul style="list-style-type: none"> • Nature of waves as an energy transfer pathway. • The wave equation. • Sound & Ultrasound & their uses. • Seismic waves and what they tell us. 	<ul style="list-style-type: none"> • Practical skills. • Graph drawing. • Drawing labelled diagrams. • Researching applications of waves. • Numeracy skills in wave calculations. • Evaluating experimental methods.

10	Extending Ideas in Physics	Topic 15 – Mechanics 2	<ul style="list-style-type: none"> • Speed. • Distance-time graphs. • Velocity. • Velocity-time graphs. • Acceleration. • Non-uniform motion. • Newton’s laws. • Resultant forces. • Resolving forces. 	<ul style="list-style-type: none"> • Practical skills. • Graph drawing. • Drawing labelled diagrams. • Numeracy skills in calculations. • Planning, conducting & evaluating experimental methods. • Resolving vectors. • Drawing the parallelogram of forces for various situations.
		Topic 16 – Radioactivity & Nuclear Physics	<ul style="list-style-type: none"> • Structure of the atom. • Rutherford’s scattering experiment. • Decay equations. • Types of radioactive decay. • Uses of radioactivity. • Nuclear Fission. • Nuclear Fusion. 	<ul style="list-style-type: none"> • Analysing & Evaluating models. • Making models based on new evidence. • Drawing labelled diagrams. • Writing practical methods. • Numeracy skills in decay equations. • Researching applications of radioactivity.
		Topic 17 – Electricity 3	<ul style="list-style-type: none"> • Resistance. • Current. • Potential difference. • Series and parallel circuits. • AC and DC. • Plugs, fuses, circuit safety, RCDs and RCCBs. • Electrical Power. 	<ul style="list-style-type: none"> • Practical skills including using all the electricity equipment. • Drawing labelled diagrams. • Using models. • Graph drawing. • Writing practical methods. • Numeracy skills in calculations. • Evaluating data to form conclusions.
		Topic 18 – EM Waves	<ul style="list-style-type: none"> • Nature of waves as an energy pathway. • The wave equation. • The EM Spectrum and its applications. • Communications. • The Doppler effect. • Red-shift. • The big bang and the possible fates of the universe. 	<ul style="list-style-type: none"> • Drawing labelled diagrams. • Researching applications of waves. • Numeracy skills in wave calculations. • Researching applications of EM waves. • Analysing models. • Making models based on new evidence. • Using scientific terminology.
		Topic 19 – Momentum	<ul style="list-style-type: none"> • Work and Energy. • GPE and Kinetic Energy. • Momentum. • Conservation of Momentum in collisions and explosions. • Impulse. • Car safety. 	<ul style="list-style-type: none"> • Analysing models. • Practical skills. • Graph drawing. • Numeracy skills in calculations. • Using scientific terminology. • Evaluating methods for improving vehicle safety.
11	Further Ideas in Physics	Topic 20 – Energy Transfer by Heating	<ul style="list-style-type: none"> • States of matter. • Kinetic theory. • Brownian motion. • The gas laws. • Conduction, convection, radiation, evaporation and condensation. • The greenhouse effect. • Specific heat capacity. • Specific latent heat. 	<ul style="list-style-type: none"> • Analysing models. • Practical skills. • Graph drawing. • Numeracy skills in calculations. • Using scientific terminology. • Evaluating data to form conclusions. • Planning, conducting & evaluating experimental methods.

		Topic 21 – Light 2	<ul style="list-style-type: none"> Nature of waves as an energy pathway. The wave equation. The EM Spectrum. Applications of the EM spectrum. Colour. Reflection & refraction. Lenses and their uses. 	<ul style="list-style-type: none"> Practical skills. Graph drawing. Numeracy skills in calculations. Using scientific terminology. Evaluating data to form conclusions. Drawing ray diagrams for reflection, refraction and lenses.
		Topic 22 – Electromagnetism	<ul style="list-style-type: none"> Magnetism. Magnetic fields. Electromagnets and their uses. The motor effect. The generator effect. Transformers. 	<ul style="list-style-type: none"> Practical skills. Graph drawing. Numeracy skills in calculations. Using scientific terminology. Evaluating data to form conclusions.
		Topic 23 – Mechanics 3	<ul style="list-style-type: none"> Moments. Gears. Centre of mass. Stability. Pendulums. Centripetal forces and circular motion. 	<ul style="list-style-type: none"> Practical skills. Graph drawing. Numeracy skills in calculations. Using scientific terminology. Evaluating data to form conclusions.
12	Introduction & Transition		<ul style="list-style-type: none"> Quantities & Units. Working as a physicist. Practical Skills. Mathematics key skills revision 	<ul style="list-style-type: none"> Practical skills. Graph drawing. Numeracy skills in calculations. Using scientific terminology. Planning, conducting & evaluating experimental methods.
		Mechanics	<ul style="list-style-type: none"> Rectilinear Motion. Momentum. Forces & Turning Forces. Work, Energy & Power. 	<ul style="list-style-type: none"> Practical skills. Graph drawing. Numeracy skills in calculations. Using scientific terminology. Planning, conducting & evaluating experimental methods.
	Electric Circuits	<ul style="list-style-type: none"> Charge & Current. Potential difference, EMF & Power. IV relationships. Resistance and Resistivity. Internal Resistance. Series and parallel circuits. Potential dividers. 	<ul style="list-style-type: none"> Practical skills. Graph drawing. Numeracy skills in calculations. Using scientific terminology. Planning, conducting & evaluating experimental methods. Evaluating data to form conclusions. 	
	Materials		<ul style="list-style-type: none"> Fluid properties. Viscosity. Stokes' Law. Solid Materials. Hooke's Law. Stress & Strain. Young Modulus. 	<ul style="list-style-type: none"> Practical skills. Graph drawing. Numeracy skills in calculations. Using scientific terminology. Planning, conducting & evaluating experimental methods. Evaluating data to form conclusions.
		Waves & the particle nature of Light	<ul style="list-style-type: none"> Nature of waves. Transmission & Reflection. Refraction. Lenses. Superposition. Particle nature of light. Photoelectric Effect. 	<ul style="list-style-type: none"> Practical skills. Drawing ray diagrams. Numeracy skills in calculations. Using scientific terminology. Planning, conducting & evaluating experimental methods. Evaluating data to form conclusions.

	Further Mechanics	<ul style="list-style-type: none"> • Momentum. • Impulse. • 2D momentum conservation. • Energy in collisions. • Elastic & Inelastic collisions. • Motion in a circle. • Centripetal forces. 	<ul style="list-style-type: none"> • Practical skills. • Graph drawing. • Numeracy skills in calculations. • Using scientific terminology. • Planning, conducting & evaluating experimental methods. • Evaluating data to form conclusions.
	Fields	<ul style="list-style-type: none"> • Gravitational Fields. • Radial / Uniform Fields. • Universal gravitation. • Electric Fields. • Capacitance. • Magnetic Fields. • Motors, Induction, Generators, & Transformers. 	<ul style="list-style-type: none"> • Drawing field diagrams and lines of equipotential. • Numeracy skills in calculations. • Using scientific terminology. • Planning, conducting & evaluating experimental methods. • Evaluating data to form conclusions.
	Nuclear & Particle Physics	<ul style="list-style-type: none"> • Electrons & Nuclei. • Discovery of the nucleus. • Particle Physics. • The standard model. • Conservation laws. • Nuclear Decay. • Uses of ionising radiation. 	<ul style="list-style-type: none"> • Analysing models. • Graph drawing. • Numeracy skills in decay equations. • Researching applications of radioactivity. • Using scientific terminology. • Planning, conducting & evaluating experimental methods. • Evaluating data to form conclusions.
	Thermodynamics	<ul style="list-style-type: none"> • States of matter. • Kinetic theory. • Brownian motion. • Specific Heat Capacity. • Internal energy and changes of state. • Gas Laws. • Absolute Zero. 	<ul style="list-style-type: none"> • Analysing models. • Graph drawing. • Numeracy skills in calculations. • Using scientific terminology. • Evaluating data to form conclusions. • Planning, conducting & evaluating experimental methods.
	Space (Astrophysics & Cosmology)	<ul style="list-style-type: none"> • Measuring distances. • Parallax & Standard candles. • Life cycles of stars. • Fission & Fusion. • Cosmological red shift & Hubble's Law. • Big bang theory & CMBR. • Dark Energy & Dark Matter. • Fates of the Universe. 	<ul style="list-style-type: none"> • Analysing models. • Graph drawing. • Numeracy skills in a range of calculations. • Researching applications of radioactivity. • Planning, conducting & evaluating experimental methods. • Evaluating data to form conclusions.
	Oscillations	<ul style="list-style-type: none"> • Oscillations & SHM. • Equations of motion for oscillating systems. • Resonance. • Damping. 	<ul style="list-style-type: none"> • Analysing models. • Graph drawing & analysis. • Numeracy skills in a range of calculations. • Researching applications of damping. • Planning, conducting & evaluating experimental methods.