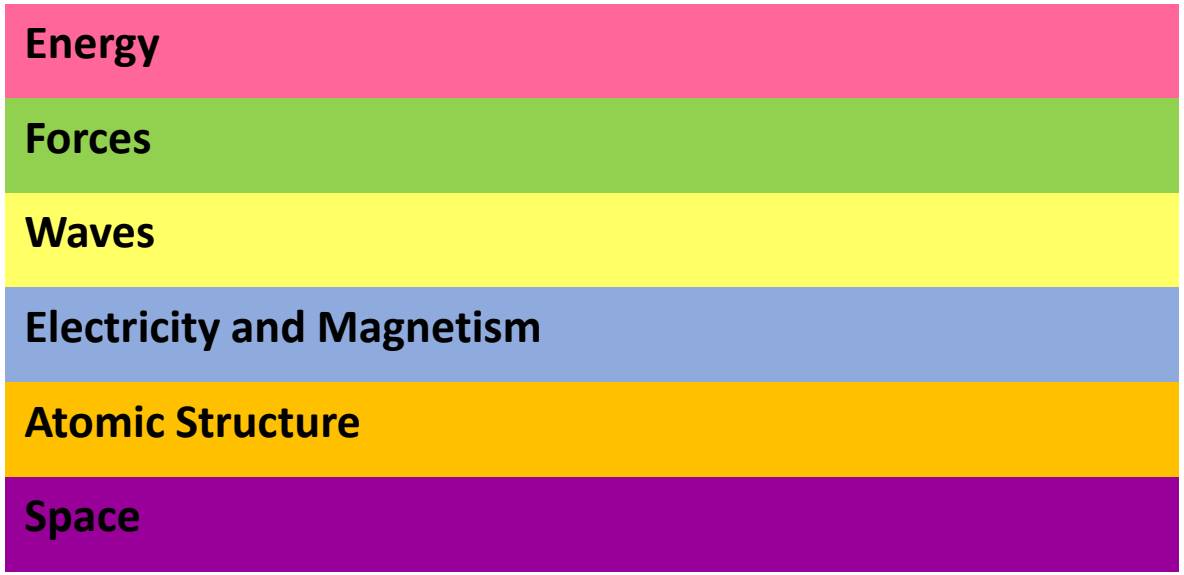

Concepts for Physics

The **Physics** curriculum at Walton High School is **evidence-informed** in its design.

- Knowledge is organised into **core themes** which are **sequenced** effectively over many years. Students make explicit **links** between different concepts.
- Knowledge is **sequenced** to ensure that students have the **pre-requisite knowledge** necessary to learn new concepts. This **reduces cognitive load** and maximises retention of new learning.
- Knowledge is **revisited** over key stages, gradually increasing in complexity in a **spiral curriculum** design. This deepens knowledge and understanding of concepts.
- We have specified the key knowledge in our KS3/4 curriculum through the use of **Core Knowledge questions**.

WALTON HIGH SCHOOL – KS3 CURRICULUM OVERVIEW FOR PHYSICS

Year Group	Half Term 1	Half Term 2	Half Term 3	Half Term 4
7	**Energy** • Types of Energy • Energy Transfers • Gravitational and Kinetic energy • Thermal Conduction • Convection and Radiation • Energy Resources for Electricity • Food and Fuel	**Forces** • Introduction to Forces • Force Diagrams and Resultant Forces • Friction • Balance and Unbalanced Forces • Pressure, Floating and Sinking	**Sound** • Introduction to Waves • Sound and the Ear • Speed of Sound • Sound and Ultrasound • Waves	**Electricity** • Static Electricity • Circuit Symbols and Diagrams • Series and Parallel Circuits • Ohm's Law • Resistance • Generating Electricity
	Core Knowledge Home Learning Resources	Core Knowledge Home Learning Resources	Core Knowledge Home Learning Resources	Core Knowledge Home Learning Resources
8	**Magnets** • Magnetism • Magnetic fields • Electromagnets • Earth's Magnetic Field	**Space** • Day and Night • The Seasons • The Moon • The Solar System and Beyond • Life Cycle of a Star • Space Exploration	**Motion** • Speed • Distance-Time Graphs • Speed-Time Graphs • Acceleration	**Light** • Light • Reflection • Refraction • The Eye • Colour
	Core Knowledge Home Learning Resources	Core Knowledge Home Learning Resources	Core Knowledge Home Learning Resources	Core Knowledge Home Learning Resources
9	**Forces** • Forces, Vectors and Scalars • Resultant Forces • Gravity • Elasticity	**Energy** • Supply and Demand • Efficiency • Thermal Conductivity and Insulation	**Waves** • Transverse and Longitudinal Waves • Light Waves • Reflection	**Electricity** • Current and Charge • Ohm's Law • Series and Parallel Circuits • Resistance • Electrical Power • Electrical Energy
	Energy • Energy Transfers • Energy Resources	**Particles and Atomic Structure** • States of Matter and Internal Energy • Changes of State • Density • Atomic Structure • Ions and Isotopes		
	Core Knowledge Home Learning Resources	Core Knowledge Home Learning Resources	Core Knowledge Home Learning Resources	Core Knowledge Home Learning Resources

WALTON HIGH SCHOOL – KS4 CURRICULUM OVERVIEW FOR COMBINED PHYSICS

Year Group	HT1 (Sept-Oct)	HT2 (Nov-Dec)	HT3 (Jan-Feb)	HT4 (March-April)	HT5 (April-May)	HT6 (June-July)
10	**Motion** • Speed and Velocity • Distance-Time Graphs • Acceleration • Velocity-Time Graphs	**Resistance** • Current-Voltage Characteristics • Resistance of a Wire • LDRs and Thermistors	**Electromagnetic Waves** • Refraction • The EM Spectrum • Heat Transfers by Radiation	**Atomic Structure** • Alpha Decay • Beta Decay • Gamma Decay • Decay Equations • Half-Life • Radioactive Contamination and Irradiation • Models of the Atom	**Newton** • Newton's Laws of Motion • Terminal Velocity • Forces and Braking Distances • Centre of Mass **Paper 1 Mock Exam** Provides an estimated grade for students as they progress into year 11.	**Domestic Electricity** • Alternating and Direct Current • National Grid • Electrical Power
	Core Knowledge **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**
11	**Energy Calculations** • Gravitational Potential Energy • Kinetic Energy • Elastic Potential Energy • 5 Mark Calculation Practice	**Electromagnetism** • Magnetic Fields • Magnetic Fields of Electrical Currents • The Motor Effect **Paper 1 Mock Exam** Provides an estimated grade for students.	**Energy Calculations** • Specific Heat Capacity • Specific Latent Heat Capacity • Particle Model • Pressure in Gases	**Forces** • Equations of Motion • Resultant Forces • Momentum • Conservation of Momentum **Paper 2 Mock Exam** Combined with the December grade to provides an estimated grade for students.	**PUBLIC EXAMINATIONS**	
	Core Knowledge **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**		

WALTON HIGH SCHOOL – KS4 CURRICULUM OVERVIEW FOR TRIPLE PHYSICS

Year Group	HT1 (Sept-Oct)	HT2 (Nov-Dec)	HT3 (Jan-Feb)	HT4 (March-April)	HT5 (April-May)	HT6 (June-July)
10	**Motion** • Speed and Velocity • Distance-Time Graphs • Acceleration • Velocity-Time Graphs **Resistance** • Current-Voltage Characteristics • Resistance of a Wire • LDRs and Thermistors • Static Electricity and Fields	**Electromagnetic Waves** • Refraction • The EM Spectrum • Heat Transfers by Radiation **Atomic Structure** • Alpha Decay • Beta Decay • Gamma Decay • Decay Equations • Half-Life • Radioactive Contamination and Irradiation • Models of the Atom	**Newton** • Newton's Laws of Motion • Terminal Velocity • Forces and Braking Distances • Centre of Mass • Momentum • Conservation of Momentum	**Domestic Electricity** • Alternating and Direct Current • National Grid • Electrical Power **Waves** • Sound and Ultrasound • Earthquakes • Lenses • Colour • Black Body Radiation	**Atomic Structure** • Medical Applications of Radiation • Background Radiation • Fission and Fusion **Paper 1 Mock Exam** Provides an estimated grade for students as they progress into year 11.	**Electromagnetism** • Magnetic Fields • Magnetic Fields of Electrical Currents • The Motor Effect **Space** • The Solar System • Satellites and Circular Motion • The Lifecycle of a Star • Cosmology • Redshift
	Core Knowledge **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**
11	**Energy Calculations** • Gravitational Potential Energy • Kinetic Energy • Elastic Potential Energy • 5 Mark Calculation Practice	**Electromagnetism** • Electric Motors • Loudspeakers • Electromagnetic Induction • The Generator Effect • Microphones • Transformers **Paper 1 Mock Exam** Provides an estimated grade for students.	**Forces** • Equations of Motion • Resultant Forces • Moments • Leavers • Gears **Energy Calculations** • Specific Heat Capacity • Specific Latent Heat Capacity • Insulators	**Pressure** • Gas Pressure • Pressure and Force • Atmospheric Pressure **Paper 2 Mock Exam** Combined with the December grade to provides an estimated grade for students.	**PUBLIC EXAMINATIONS**	
	Core Knowledge **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**	**Core Knowledge** **Home Learning Resources**		

Fields and Electricity
Atom Properties
Waves
Mechanics
Astrophysics

The Core Themes in Physics A Level

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- We have specified the key knowledge in our KS3/4 curriculum through the use of **Core Knowledge questions**.

Year Group	HT1 (Sept-Oct)	HT2 (Nov-Dec)	HT3 (Jan-Feb)	HT4 (March-April)	HT5 (April-May)	HT6 (June-July)
12	**Electricity** Current, Voltage Power and Resistance EMF and internal resistance Resistivity	**Electricity** Circuit Rules and Components Potential Dividers Sensor Circuits	**Waves** Waves basics Coherence and phase difference Superposition Diffraction Youngs double slit +practical	**Waves** EM Waves Emission spectra Reflection, refraction and TIR Waves for communication Harmonics and stationary waves	**Practical Skills**	**Practical Skills**
	Mechanics Vectors and Scalars Equilibrium Forces Moments Stability	**Mechanics** SUVAT Freefall Projectile motion Required practical	**Mechanics** Newtons laws Car safety Momentum Elastic and Inelastic collisions	**Mechanics** Work and Energy GPE and KE Power Energy and efficiency	**Further Mechanics** Circular motion Oscillations SHM	**Further Mechanics** Pendulums Energy and SHM Forced vibrations and Resonance
	Particles Properties of the atom The standard model Forces and Interactions	**Particles** The weak Interaction The strong interaction Feymann Diagrams Conservation rules	**Quantum** Photoelectric effect Energy levels Spectra Wave particle duality	**Materials** Density Hooke's Law Deformation of solids Youngs modulus +practical	**Nuclear** Discovery of the nucleus Alpha Beta Gamma Half Life	**Nuclear** Radioactive decay N-Z Curve Consolidation
13	**Nuclear Physics** Fission and Fusion Nuclear Radii Consolidation and test	**Astrophysics** Lenses and Telescopes Resolving power Classification of Stars Main sequence stars	**Astrophysics** Black Holes Spectral Classes Doppler and Hubble Quasars CCDs	**Astrophysics** Weins Law Exoplanets Redshift Theories of the Universe	**PUBLIC EXAMINATIONS**	
	Fields Gravitational Fields Gravitational potential Orbital Motion	**Fields** Field patterns Electrical field strength Electric potential Point charges Comparison of fields	**Fields** Magnetic fields Generating electricity	**Fields** Capacitance		
	Further Mechanics Pendulums Energy and SHM Forced Vibrations	**Thermal Physics** Gas properties Kinetic theory	**Thermal Physics** Specific and Latent heat capacity Gas Laws + practical's	**AS Revision**		