Year 10 Physics

AUTUMN TERM

Energy
- Energy changes
- Efficiency
- Energy resources

Particle model
- Density of materials
- Internal energy & changes of state
- Specific heat capacity and latent heat
- Pressure in gases

Atomic structure
- Structure of the atom
- Radiation
- Half life

SPRING TERM

Atomic structure
- Uses of radiation
- Nuclear fusion

Forces (part 1)
- Scalars/vectors and contact/non contact forces
- Resultant forces
- Gravity
- Forces and elasticity
- Moments
- Pressure

Forces (part 2)
- Distance, speed and velocity
- Acceleration
- Newton's laws of motion

SUMMER TERM

Forces (part 2)
- Thinking, braking and stopping
- Conservation of momentum

Space
- Our Solar System
- Life Cycle of a star
- Satellites and Moons
- Red shift and evidence for the Big Bang

YEAR 10 CURRICULUM OVERVIEW

Building on core knowledge and skills developed in KS3 science, including:

Eg **describing** food tests, **explaining** enzyme activity, **evaluating** heart disease treatments …

Year 11 Physics

AUTUMN TERM

Forces (part 2)

- Distance, speed and velocity
- Acceleration
- Newton's laws of motion
- Thinking, braking and stopping
- Conservation of momentum

Waves

- Wave properties
- Reflection and refraction of waves
- Uses of waves

SPRING TERM

Waves

- Uses of waves
- Lenses
- Emission and absorption

Magnetism

- Magnetic fields
- Electromagnets
- Applications of electromagnetism
- Electromagnetic induction

SUMMER TERM

Building confidence through consolidation of skills, development of problem solving and synoptic thinking.

YEAR 11 CURRICULUM OVERVIEW

Building on core knowledge and skills developed in year 10 Physics, including: **calculating** features of motion, **applying** Newton's laws to changes in motion **planning** an investigation to investigate wave properties, **explaining** how the uses of waves are related to their properties, **drawing** lens/refraction diagrams, **identifying** the parts and operation of electromagnets and motors

Year 12 Physics

AUTUMN TERM

Particles and radiation

- Atomic structure and particle classification
- Particle interactions
- Photoelectric effect
- Wave-particle duality

Mechanics

- Forces in equilibrium
- Moments
- Motion graphs
- Newton's laws of motion
- Projectiles
- Momentum
- Power

Materials

- Density
- Stretching and compressing objects

SPRING TERM

Waves

- Progressive waves
- Superposition & stationary waves
- Resonance
- Diffraction & interference
- Refraction

Electricity

- Current, pd & resistance
- I-V characteristics and resistivity
- Power
- E.M.F & internal resistance
- Potential dividers

Periodic motion

- Simple harmonic motion
- Free and forced vibrations

SUMMER TERM

Circular motion

- Centripetal force and acceleration

Simple harmonic motion

- Calculations with SHM
- Free and forced vibrations

Astrophysics

- Lenses
- Optical telescopes
- Non-optical telescopes
- Classification and evolution of stars
- Supernovae, neutron stars and black holes

YEAR 12 CURRICULUM OVERVIEW

Building on core knowledge and skills developed in year GCSE Physics, including: **explaining** the nature of measurement errors and of their numerical treatment, **describing** the fundamental properties of matter, and to electromagnetic radiation and quantum phenomena, **comparing** the characteristics, properties, and applications of travelling waves and stationary waves, **comparing** forces, energy and momentum and materials in terms of their bulk properties and tensile strength, **evaluating** the electrical applications of circuits, **discovering** the ways in which information from objects in space can be gathered

Year 13 Physics

AUTUMN TERM

Fields
- Gravitational fields
- Electric fields
- Magnetic fields

Thermal Physics
- Gas laws
- Ideal gases
- Kinetic energy (gases)
- Development of theories

Capacitance
- Energy stored in capacitors
- Dielectrics
- Charging and discharging

SPRING TERM

Fields
- Magnetic fields
- Transformers

Nuclear Physics
- Rutherford scattering
- Nuclear radius and density
- Properties of radiation
- Exponential law of decay & half life
- Mass defect and binding energy
- Fission and fusion
- Nuclear fission reactors

SUMMER TERM

Building confidence through consolidation of skills, development of problem solving and synoptic thinking.

YEAR 13 CURRICULUM OVERVIEW

Building on core knowledge and skills developed in year Y12 Physics, including: **explaining** the thermal properties of materials, the properties and nature of ideal gases, and the molecular kinetic theory, **comparing** ideas about ideas of gravitation, electrostatics and magnetic field theory, **evaluating** the physics that underpins nuclear energy production and its impact on society