# Physics Learning Journey

THE WINSFORD ACADEMY

Exams
Combined science x6 1hr 15 minute
Triple x6 1 hr 45 minute

Solar system, stability of orbital motions, satellites
Orbital motion, natural and artificial satellites

Solar system, stability of orbital motions, satellites
Our solar system

**P8 – Space physics (Triple**

Red shift
Big bang theory

Solar system, stability of orbital motions, satellites
The life cycle of a star

Triple – induced potential, transformers and the national grid
Microphones
transformers

**P7 – Magnetism and electromagnetism**

Electromagnetic waves
Types of electromagnetic waves
Properties of electromagnetic waves

Triple - Lenses
Refracted light

Triple content
Visible light

Triple – black body radiation
Perfect black bodies and radiation

The motor effect
Triple – electric motors and loudspeakers

Triple – induced potential, transformers and the national grid
Microphones
transformers

Triple – reflection of waves
Required practical – light

Waves in air, fluid and solids
Properties of waves
Required practical - waves

Electromagnetic waves
Required practical – radiation and absorption
Uses and applications of electromagnetic waves

Triple – black body radiation
Emission and absorption of infrared radiation

Permanent and induced magnetism, magnetic forces and fields
Poles of a magnet
Magnetic fields

The motor effect
Electromagnetism
Fleming's left-hand rule
Electric motors

Momentum
Momentum is a property of moving objects
Conservation of momentum

Forces and braking
Stopping distance
Triple – emergency stops and different vehicles

Forces, acceleration and Newton's law of motion
Newton's first law
Newton's second law

Forces and motion
Speed
Velocity

Forces and motion
Distance and displacement

Waves in air, fluid and solids
Transverse and longitudinal waves

**P6 - Waves**

Triple – changes in momentum
Calculations of an event
Changes in momentum

Forces and braking
Reaction time
Factors affecting breaking distance

Forces, acceleration and Newton's law of motion
Required practical – acceleration
Newton's third law

Forces and motion
Distance-time relationship
Acceleration

Triple – Pressure and pressure differences in fluids
Pressure in a fluid

Triple – Pressure and pressure differences in fluids
Atmospheric pressure

Triple – Hazards and uses of radioactive materials
Different half-lives of radioactive isotopes
Uses of nuclear radiation

Triple – Nuclear fission and fusion
Nuclear fission
Nuclear fusion

**P5 - Forces**

Forces and their interactions
Contact and non-contact forces

Work done and energy transfer
Work done

Triple – moments, levers and gears
Moments

**YEAR 11**

Atoms and nuclear radiation
Radioactive contamination

Triple – Hazards and uses of radioactive materials
Background radiation

Forces and their interactions
Scalar and vector quantities

Forces and their interactions
Gravity
Resultant force

Forces and elasticity
Required practical – Force and extension

Forces and elasticity
Required practical – Force and extension

Atoms and nuclear radiation
Half-lives and the random nature of radioactive decay

Atoms and nuclear radiation
Nuclear equations

Atoms and isotopes
Mass number, atomic number and isotope

**P4 – Atomic structure**

Triple - Pressure
Pressure in gases

Internal energy and energy transfers
Change of state and specific latent heat

Internal energy and energy transfers
Temperature changes in a system and specific heat capacity

Atoms and nuclear radiation
Radioactive decay and nuclear radiation

Atoms and isotopes
The development of the model of the atom

Atoms and isotopes
The structure of an atom

Triple - Pressure
Increasing the pressure of a gas

Particle model and pressure
Particle motion in gases

Internal energy and energy transfers
Internal energy

Change of state and particle model
Change of state

Energy transfers
Energy transfers in everyday appliances

The national grid
The national grid system

Triple - static electricity
Static charge

**P3 – Particle model of matter**

Change of state and particle model
Required practical – density

Current, potential difference & resistance
Required practical – I-V characteristics

Current, potential difference & resistance
Required practical – resistance
Resistors

Domestic use and safety
Mains electricity

Energy transfers
Power

The national grid
The national grid system
Transformers

Triple - static electricity
Electric fields

Change of state and particle model
Density of materials

Current, potential difference & resistance
Circuit symbols
Electrical charge and current

Energy resources
Renewable energy
Nonrenewable energy

Energy changes
Energy stored & systems
Calculating changes in energy
Specific heat capacity RP
power

Current, potential difference & resistance
Current, resistance and potential difference

**Bonding, structure and the properties of matter**

Energy conservation & dissipation
Energy changes in a system
Required practical - Insulation (Triple)
Efficiency

**Unit 1 Energy**

**YEAR 10**