



West Park School

Triple Physics

GCSE Examination Summer 2024

In readiness for your GCSE examinations in Physics you must **LEARN** and **REVISE** the following content and skills:

Physics: Paper 1

Energy

Energy stores and systems and changes in energy, including using equations for kinetic, gravitational potential and elastic potential energy.

Power and efficiency including their equations.

Renewable and finite energy sources.

Electricity

Electrical energy transfers including all equations including $P = VI$, $P = I^2R$, $E = Pt$. and $E = QV$.

Current, potential difference, resistance and electrical charge.

Circuit symbols and circuit drawing.

Resistors and IV graphs.

Series and parallel circuits.

Mains electricity – Inc. wiring a plug and energy transfers in everyday electrical appliances.

The National Grid.

Static electricity – static charge and electric fields.

Particles

Changes of state and density.

Internal energy, specific heat capacity and specific latent heat.

The particle model and pressure.

Radioactivity

The structure of an atom, mass number, atomic structure and isotopes.

The development of the model of the atom (common content with chemistry).

Radioactive decay, nuclear radiation, decay equations and half-lives.

Radioactive contamination and safety.

Hazards of uses or radioactive emissions and of background radiation.

Nuclear fission and fusion.

Required Practical Activities:

Specific heat capacity

Investigation to determine the specific heat capacity of one or more materials.

The investigation will involve linking the decrease of one energy store (or work done) to the increase in temperature and subsequent increase in thermal energy stored.

Resistance

Use circuit diagrams to set up and check appropriate circuits to investigate the factors affecting the resistance of an electrical circuit.

This should include: the length of a wire (at constant temperature); combinations of resistors in series and parallel.

I-V characteristics

Use circuit diagrams to construct appropriate circuits to investigate the I-V characteristics of a variety of circuit elements including a filament lamp, a diode and a resistor at constant temperature.

Density

Volume should be determined from the dimensions of regularly shaped objects and by a displacement technique for irregularly shaped objects.

Dimensions to be measured using appropriate apparatus such as a ruler, micrometre or Vernier callipers.

Thermal insulation

Investigating the effect of insulation on temperature change

Physics: Paper 2

Forces

Forces and their interactions (gravity, resultant forces).

Work done and energy transfer.

Forces and elasticity (Hooke's law and elastic potential energy).

Moments, levers and gears.

Pressure and pressure differences in fluids.

Forces and motion – Distance, displacement, velocity, acceleration, distance – time graphs, velocity – time graphs.

Newton's 3 laws of motion, stopping distance.

Momentum – conservation of momentum, changes in momentum, the physics of seat belts, air bags etc.

Waves

Waves in air, fluids and solids.

Types of waves, transverse, longitudinal, properties of waves.

Sound waves, ultrasound and seismic waves.

Electromagnetic waves.

Lenses.

Visible light.

Black body radiation

Magnetism and electromagnetism

Permanent and induced magnetism (poles of a magnet).

Magnetic forces and fields.

Electromagnetism.

The motor effect.

Fleming's left-hand rule.

Electric motors.

Loudspeakers, microphones, transformers, transformer equation, power input/output of a transformer, generator effect.

Space physics

Solar system, the life cycle of stars, stability of orbital motions, satellites.

Red Shift.

Required Practical Activities:

Force and Extension

Investigate the relationship between force and extension for a spring.

Acceleration

Investigate the effect of varying the force on the acceleration of an object of constant mass and the effect of varying the mass of an object on the acceleration produced by a constant force.

Waves

Make observations to identify the suitability of apparatus to measure the frequency, wavelength and speed of waves in a ripple tank and waves in a solid and take appropriate measurements.

Radiation and absorption

Investigate how the amount of infrared radiation absorbed or radiated by a surface depends on the nature of that surface.

Reflection and Refraction

Reflection and refraction by different materials.

Assessment Objectives and Skills

In the examinations you will be expected to address the following assessment objectives:

AO1: Demonstrate knowledge and understanding of: scientific ideas; scientific techniques and procedures.

AO2: Apply knowledge and understanding of: scientific ideas; scientific techniques and procedures.

AO3: Analyse information and ideas to: interpret and evaluate; make judgements and draw conclusions; develop and improve experimental procedures.

Extended response – all examinations will include a number of “long answer” questions.

Maths – you will be expected to show basic mathematical skills in all exams. Biology papers will include at least 10% mathematical content, Chemistry papers 20% and Physics 30%.

RPA – There will be at least one question about a required practical activity in each examination.