A-LEVEL PHYSICS LEARNING JOURNEY

AQA

ROYAL WOOTTON BASSETT ACADEMY
A global school in a local community

EXAMS

Year 13

ASTROPHYSICS

The Big Bang
Cosmology
Doppler Effect
Astronomical Distances
Evolution of the Universe
Energy Levels and Spectra
HR Diagram
Life Cycle of Stars
Analysing Stars

NUCLEAR PHYSICS

Carbon Dating
Half-life
Exponential Decay
Nuclear fission
Nuclear fusion
Binding Energy
Einstein's mass-energy equation
Nuclear decay
Radio- activity

Required Practical 12 - Investigation of the inverse-square law for gamma radiation.

THERMAL PHYSICS

Specific Heat Capacity
Kinetic Theory of Gases
Specific Latent Heat

Required Practical 8 - Investigation of Boyle's (constant temperature) law and Charles's (constant pressure) law for a gas.

FIELDS

Charged Particles in an E-Field
Kepler's Laws
Coulomb's Law
Electric Potential
Charged Particles in a Magnetic Field
Transformers
EM Induction
Gravitational Potential
Newton's Law of Gravitation

$$F = G\frac{M_1 M_2}{r^2}$$

Required Practical 9 - Investigation of the charge and discharge of capacitors. Analysis techniques should include log-linear plotting leading to a determination of the time constant RC.

Required Practical 11 - Investigate, using a search coil and oscilloscope, the effect on magnetic flux linkage of varying the angle between a search coil and magnetic field direction.

Required Practical 10 - Investigate how the force on a wire varies with flux density, current and length of wire using a top pan balance

CIRCULAR & SHM

Resonance
Damping

Required Practical 7 - Investigation into simple harmonic motion using a mass-spring system and a simple pendulum.

ELECTRICITY

Combining Resistors
Analysing Circuits
Kirchhoff's First Law
Potential Divider
IV Characteristi
Pd and EMF
Electrical Current
Resistivity

Required Practical 5 - Determination of resistivity of a wire using a micrometer, ammeter and voltmeter.

Required Practical 6 - Investigation of the emf and internal resistance of electric cells and batteries by measuring the variation of the terminal pd of the cell with current in it

MECHANICS & MATERIALS

Momentum
Hooke's Law and Young's Modulus
Density and Pressure
Deforming Materials
Conservation of Energy
Power
Scalars & Vectors
Kinematics and the motion of bodies
Newton's Laws of Motion

Required Practical 4 - Determination of the Young modulus by a simple method.

Required Practical 3 - Determination of g by a free-fall method.

Year 12

WAVES

Superposition of waves
Diffraction
Reflection and refraction
polarisation
Total Internal Reflection
Stationary waves

Required Practical 2 - Investigation of interference effects to include the Young's slit experiment and interference by a diffraction grating..

Required Practical 1 - Investigation into the variation of the frequency of stationary waves on a string with length, tension and mass per unit length of the string.

PARTICLES & RADIATION

Wave-Particle Duality
Quantum Physics
Quarks
The nucleus
The Photon Model
The Photoelectric Effect
Anti-particles, hadrons and leptons
Alpha Particle Scattering
Particle Physics

$p = \hbar k$

MEASUREMENTS & ERRORS

uncertainty
Combining uncertainty