GCSE PHYSICS LEARNING JOURNEY

UTC SWINDON

Understanding and Applying Scientific Skills

Year 10 → Year 11

- Understanding variables
- Writing methods
- Assessing impact of scientific concepts
- Drawing conclusions
- Applying math to the scientific concepts
- Describe patterns
- Evaluation of scientific concepts
- Drawing graphs and analysing graphical data
- Analysis of secondary data
- Modelling scientific concepts
- Understanding relationships between science and society
- IDEAL Identify, describe, explain, apply, link
- Risk Assessment
- Evaluating data and investigations

Final GCSE exams

Revision

Space

- Planets, satellites, orbits
- Solar System
- Expanding Universe & its future
- Life of a Star

EM Induction

- National grid
- Transformers
- Transformers and energy

Magnetism

- Magnets and magnetic fields
- Magnetic fields
- Electrom-agnetism
- Attraction and repulsion

Light

- Colours
- The eye
- Reflection
- The camera
- Refraction
- Light

EM Spectrum

- EM radiation dangers
- Electromagnetic waves
- Using the short and long wavelengths
- The electromagnetic spectrum

Sound

- Sound and energy transfer
- Waves
- Echoes of ultrasound
- Loudness and pitch
- Detecting sound
- Speed of sound
- Ears and hearing
- Waves crossing boundaries
- Wave calculations

$$Frequency = \frac{Velocity}{Wavelength}$$

$$f = \frac{v}{\lambda}$$

Unit of Frequency: Hz

Waves

- Infrasound & ultrasound
- Reflection & refraction
- Features of waves

Motion & Pressure

- Speed
- Motion graphs
- Pressure in liquids
- Turning forces
- Pressure in gasses
- Pressure in solids

Forces Doing Work

- Calculating work done
- Resolving vectors
- Power/Work done relationship
- Fields
- Calculating power

Forces and matter

- Bending and stretching
- Investigating springs

YEAR 11

Particle Model

- Gas temperature & pressure
- Specific heat capacity
- Kinetic energy
- Specific latent heat
- Density

Radioactivity

- Atomic models
- Electrons and orbits
- Background radiation
- Beta decay and nuclear equations
- Inside atoms
- Alpha, beta and gamma
- Understanding and calculating half lives
- Dangers of ionizing radiation

Forces and motion

- Crash hazards
- Distance and velocity time graphs
- Mass and weight
- Vectors and scalars
- Forces and quantities
- Acceleration
- Newton
- Stopping distances
- Resultant forces
- Momentum

Electricity

- Wiring a plug
- Power
- AC/DC & electrical safety
- Resistance in circuits
- Transferring energy
- Voltage
- Electricity in our homes
- Potential difference
- Circuits – parallel and series
- Resistance
- Current

Energy

- Renewable and non-renewable energy
- Efficiency
- Energy transfers
- Energy adds up
- Energy transfer - particles
- Conduction & Convection
- Energy & Power
- Gravitational energy
- Kinetic energy
- Energy & food
- Energy & Temperature
- Radiation
- Energy resources
- Work, Energy and Machines

$$\Delta E_p = mg\Delta h$$

$$E = \frac{1}{2}mv^2$$

(kinetic energy / mass / velocity)

YEAR 10