Learning Journey Map
Year 13 – Physics

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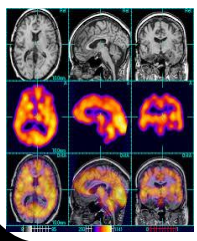
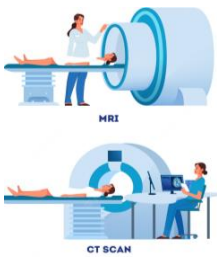
OCR
Oxford Cambridge and RSA

Further study



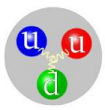
P27: Medical Imaging

- ❑ X-rays & their interaction
- ❑ CAT scans
- ❑ The gamma camera
- ❑ PET scans
- ❑ Ultrasound
- ❑ Acoustic impedance
- ❑ Doppler imaging



P24: Particle physics

- ❑ Alpha scattering experiment
- ❑ The nucleus
- ❑ Antiparticles, hadrons & leptons
- ❑ Quarks
- ❑ Beta decay



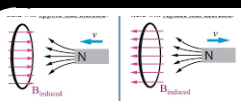
$$\beta\,(\text{beta particle}) = e^{0}_{-1}$$

P25: Radioactivity

- ❑ Radioactivity
- ❑ Nuclear decay equations
- ❑ Half-life & activity
- ❑ PAG: Absorption and random nature of radiation
- ❑ Radioactive decay calculations
- ❑ Modelling radioactive decay
- ❑ Radioactive dating

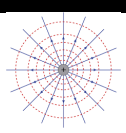
P26: Nuclear physics

- ❑ Einstein's mass-energy equation
- ❑ Binding energy
- ❑ Nuclear fission
- ❑ Nuclear fusion



P23: Magnetic fields

- ❑ Magnetic fields
- ❑ Charged particles in B field
- ❑ Electromagnetic induction
- ❑ Faraday & Lenz's law
- ❑ Transformers



P22: Electric Fields

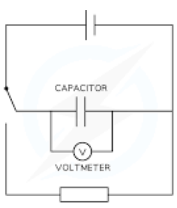
- ❑ Electric fields
- ❑ Coulomb's law
- ❑ Uniform E fields & capacitance
- ❑ Charged particles in E field
- ❑ Electric potential energy

Module 6: Particles & Medical physics

P21: Capacitance

$$C = \frac{Q}{V}$$

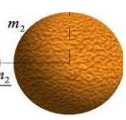
- ❑ Capacitors and circuits
- ❑ Energy stored by capacitors
- ❑ Discharging capacitors
- ❑ Charging capacitors
- ❑ Uses of capacitors



YEAR 13

P18: Gravitational Fields

- ❑ Gravitational fields
- ❑ Newton's Laws of gravity
- ❑ GFS for a point mass
- ❑ Kepler's Laws
- ❑ Satellites
- ❑ Gravitational potential & Energy



$$\vec{F}_g = \frac{Gm_1m_2}{r^2}$$

P19: Stars

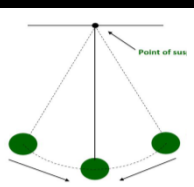
- ❑ Objects in the Universe
- ❑ Life cycle of Stars
- ❑ Hertzsprung-Russel diagram
- ❑ Energy levels in atoms
- ❑ Spectra
- ❑ Analysing starlight
- ❑ Stellar luminosity

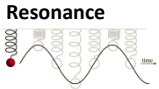
P20: Cosmology

- ❑ Astronomical distances
- ❑ The Doppler effect
- ❑ Hubble's law
- ❑ The Big Bang theory
- ❑ Evolution of the Universe

P17: Oscillations

- ❑ Oscillations
- ❑ Simple harmonic motion
- ❑ SHM and Energy
- ❑ Damping and driving
- ❑ Resonance

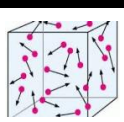




P16: Circular motion

- ❑ Angular velocity
- ❑ Centripetal acceleration
- ❑ Exploring centripetal forces

P15: Ideal gases



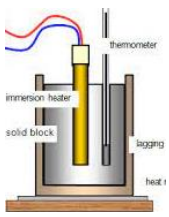
- ❑ The kinetic theory of gases
- ❑ Gas laws
- ❑ PAG: Estimating absolute zero: Charles' Law
- ❑ Root mean square speed
- ❑ The Boltzmann constant

$$\frac{P_1V_1}{T_1} = \frac{P_2V_2}{T_2}$$

Review of summer learning
Module 5: Newtonian World and Astrophysics

P14: Thermal physics

- ❑ Temperature
- ❑ Solids, liquids, gases
- ❑ Internal energy
- ❑ Specific heat capacity
- ❑ PAG: Investigating SH capacity
- ❑ Specific latent heat



CURRICULUM OVERVIEW

Development of key scientific skills: planning valid experiments, carrying out practicals safely, displaying & processing data, as well as analysing & evaluating results

Possible careers

Research scientist, materials scientist, seismologist, mechanical engineer, architect, radiation oncology, theme park ride designer, audiologist, optician, space technology, Electrical engineer, civil engineer and many more!!

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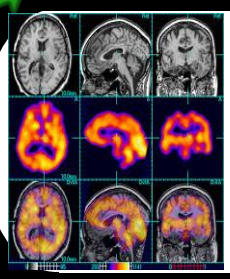

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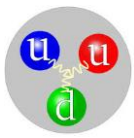

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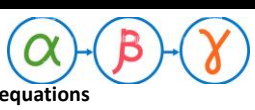

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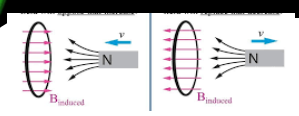

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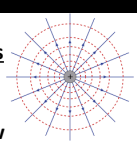

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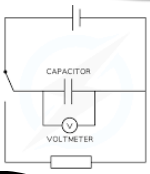

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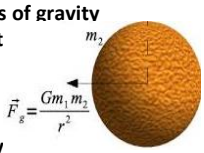

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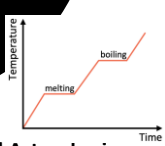

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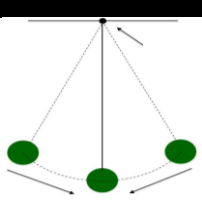

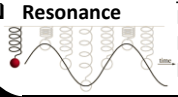

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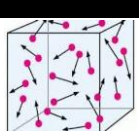

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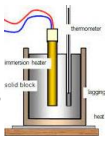

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