

YEAR 10 CURRICULUM INFORMATION – Physics

Autumn 1

Autumn 2

What will students be learning?

Motion

- Speed and distance-time graphs
- Acceleration
- Velocity-time graphs

Pressure

- Pressure and surfaces
- Pressure in a liquid at rest

Radioactivity

- Atoms and properties of ionising radiation
- The discovery of the nucleus
- Changes in the nucleus
- Activity and half-life
- Nuclear radiation in medicine
- Nuclear Fission

Electricity In The Home

- AC/DC Electricity
- Cables and Plugs
- Electrical Power and Potential Difference
- Electrical Current and Energy Transfer
- Appliances and Efficiency

Pressure

- Atmospheric pressure
- Upthrust and flotation

Radioactivity

- Nuclear Fusion
- Nuclear Issues

Balanced Forces

- Vectors and Scalars
- Forces Between Objects & Resultant Forces
- Moments at Work
- More About Levers and Gears
- Centre of Mass
- Moments and Equilibrium

Wave Properties






- The Nature of Waves
- The Properties of Waves
- Reflection and Refraction (HT)
- More About Waves

How will students be assessed?

1. Milestone test at the end of the topic
2. In-class formative review each lesson

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2. In-class formative review each lesson
3. Required Practical – Force and Acceleration

<p>Literacy – What keywords will be taught?</p>	<p>Speed, velocity, distance, displacement, vector, scalar, acceleration, state of motion, gradient, tangent, linear, proportional, rate of increase/decrease</p> <p>Pressure, surface area, cross-sectional area, kinetic theory, collision, energy transfer</p> <p>Ionising, radiation, radioactive, radioactivity, background radiation, irradiation, contamination, penetration, ionising ability, ion, charge, magnetic field, electric field, alpha, beta, gamma, nucleus, deflection, scintillating, emitting, half-life, decay, isotope, atomic number, atomic mass, nuclear fission, contrast, gamma camera, uranium, plutonium, neutron, daughter nuclei</p> <p>Alternating / direct current, earth, neutral, live, potential difference, current, power, rate of transfer, appliance, efficiency, wasted energy, percentage</p>	<p>Atmosphere, hecto- (as a prefix), pascal, atmospheric pressure, sea level, altitude, column, pressure, force, particle, collision, upthrust, submerge, partial, float, sink, density, flotation</p> <p>Nuclear fusion, hydrogen, nuclei, temperature, pressure, element, proton, neutron, nucleus, nuclear waste, contamination, irradiation, half-life, activity</p> <p>Vector, scalar, resultant, free body diagram, force vector, moment, equilibrium, clockwise / anti-clockwise, lever, gear, force multiplier, distance multiplier, centre of mass, line of action, plumb bob, pivot, fulcrum</p> <p>Wave, oscillation, frequency, wavelength, amplitude, Hertz, vibration, reflection, refraction, medium, normal, perpendicular, angle of incidence, angle of reflection, angle of refraction</p>
<p>What employability skills are being developed?</p>	<ul style="list-style-type: none"> • Problem solving (reducing energy usage in the home, explanation why National Grid PD is so high compared to domestic PD, finding ways to maximise / minimise pressure on surfaces for intended outcomes) • Numeracy (Calculations of speed, acceleration, electrical power, efficiencies, electrical energy required) • Practical skills (ability to wire a plug, measuring speed and time, calculating acceleration) 	<ul style="list-style-type: none"> • Problem solving (finding equilibrium positions for complex moment arrangements, considering whether an object will sink/float by calculation, discussion of how to solve the nuclear waste storage issue) • Numeracy (calculations of pressure and volume changes in a closed system, half-lives of radioactive substances, moment calculations) • Literacy (reading of viewpoints and common beliefs of nuclear energy, with discussion of these) • Extended writing (discussion of the nuclear waste problem and how nuclear energy can/might not be part of the global warming solution) • Practical skills (measuring centre of mass, finding equilibrium positions)

<p>Wider Curriculum Links?</p>	<ul style="list-style-type: none"> • Home DIY / real life physics – Wiring plugs safely and understanding how appliance efficiency has an effect on heating / electricity bills in the home. • Careers links – electrical engineer / electrician, particle physics researcher, radiographer, cancer treatment professional, design engineer, motion analyst. 	<ul style="list-style-type: none"> • Careers links – operations involving lifting such as civil engineering / freight management / cargo pilot / military air loadmaster / surveying relying on understanding of tensile forces and equilibrium. Also meteorology and space biologist links from pressure and atmospheric study. • Sports – Pressure effects on scuba diving, mountaineering, flying any unpressurised aircraft / balloons, sports equipment and motion analysis of any movement in sport.
<p>What useful websites are there for this topic?</p> <p>Click links for more info</p>	<div style="display: flex; justify-content: space-around; align-items: center; text-align: center;"> <div data-bbox="689 528 833 663">  <p>Free Science Lessons</p> </div> <div data-bbox="990 531 1120 660">  <p>Primrose Kitten</p> </div> <div data-bbox="1214 520 1357 663">  <p>GCSE Pod</p> </div> <div data-bbox="1429 531 1568 663">  <p>BBC Bitesize</p> </div> <div data-bbox="1684 531 1832 671">  <p>Oak National Academy <i>Select KS4 Science (Triple)</i></p> </div> </div>	
<p>What wider reading could be done for this topic?</p> <p>Click links for more info</p>	<p>Textbook (<i>separate sciences</i>): AQA GCSE Physics Student Book (3rd Ed)</p> <p>Textbook (<i>combined science</i>): AQA GCSE Physics for Combined Science (Trilogy) Student Book (3rd Ed)</p> <p>Revision Guide (<i>separate sciences</i>): AQA GCSE 9-1 Physics All-in-One Complete Revision and Practice (<i>available on ParentPay</i>)</p> <p>Revision Guide (<i>combined science</i>): AQA GCSE 9-1 Combined Science Higher All-in-One Complete Revision and Practice (<i>available on ParentPay</i>)</p>	
<p>What else can students be doing independently to develop their understanding of this topic?</p> <p>Click links for more info</p>	<p>Exam Question Practice (<i>matches the revision guides on ParentPay</i>): Collins AQA GCSE 9-1 Physics Workbook</p> <p>Exam Question Practice (<i>Separate Higher Tier</i>): CGP GCSE Physics AQA Exam Practice Workbook - Higher</p> <p>Exam Question Practice (<i>Combined Higher Tier</i>): CGP GCSE Combined Science AQA Exam Practice Workbook – Higher</p> <p>Exam Question Practice (<i>Separate Foundation Tier</i>): CGP GCSE Physics AQA Exam Practice Workbook - Foundation</p> <p>Exam Question Practice (<i>Combined Foundation Tier</i>): CGP GCSE Combined Science AQA Exam Practice Workbook - Foundation</p>	