



Curriculum Map: Year 10 Subject: GCSE Physics (Separate Science) Exam Board: AQA

| <b>Topic</b>            | <b>Key Knowledge</b><br><i>What will all students KNOW by the end of the topic?</i>   | <b>Key Skills</b><br><i>What key skills will be learnt/developed by the end of the topic? What will all students be able to DO by the end of the topic?</i>  | <b>Assessment Opportunities</b><br><i>What are the key pieces of assessment? How will students be assessed?</i>   |
|-------------------------|---|--|---|
| <b>Atomic Structure</b> | <ul style="list-style-type: none"> <li>- Recap of atoms &amp; isotopes (from start of Year 9 Chemistry &amp; end of year 9 Physics)</li> <li>- Radioactive decay &amp; nuclear radiation</li> <li>- Nuclear equations</li> <li>- Half-lives</li> <li>- Contamination, irradiation &amp; their hazards</li> <li>- Hazards &amp; uses of radioactive emissions</li> <li>- Background radiation</li> <li>- Nuclear fission &amp; fusion</li> </ul> | <ul style="list-style-type: none"> <li>- Recall key terminology including the nature of alpha, beta &amp; gamma decay</li> <li>- Balance nuclear equations</li> <li>- Use graphs &amp; calculations in relation to half-lives</li> <li>- Interpretation of data &amp; application of knowledge to problem solving</li> <li>- Apply their knowledge of nuclear radiation to evaluate the best source of radiation to use in a given situation</li> <li>- Evaluate the perceived risk of using nuclear radiations in relation to given data</li> </ul> | <ul style="list-style-type: none"> <li>- Analysis of practical results</li> <li>- PPQ</li> <li>-Homework</li> <li>- Half life modelling and graph interpretation</li> <li>- Graph analysis</li> <li>- starter tasks interleaving previous knowledge from last lesson/ year 9 content retrieval</li> <li>- PPQ</li> <li>-AfL throughout lessons</li> <li>- Homework Tasks</li> <li>- Analysis of Risk with Nuclear Forces</li> <li>-Assessment 1</li> <li>-Assessment 2</li> <li>-Mocks</li> </ul> |
| <b>Electricity</b>      | Recap of Current Electricity, Resistance from Year 9 <ul style="list-style-type: none"> <li>- Series &amp; parallel circuits</li> <li>- Required practical 4 – IV graphs (in 3 parts – resistor, filament lamp &amp; diode)</li> <li>- Ohm’s law &amp; resistance</li> <li>- Thermistors &amp; LDRs</li> <li>- Mains electricity &amp; the National Grid</li> </ul>   | <ul style="list-style-type: none"> <li>-Building simple circuits</li> <li>- Calculations involving current, energy, charge, p.d. &amp; time</li> <li>- Use of models to understand the unobservable</li> <li>- Building more complex circuits &amp; taking measurements</li> </ul>   | <ul style="list-style-type: none"> <li>- Analysis of practical results</li> <li>- PPQ</li> <li>- Required Practical Skills</li> <li>- Graph analysis</li> <li>- starter tasks interleaving previous knowledge from last lesson/ year 9 content retrieval</li> </ul>   |

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|                                 |   |   |  |
|---------------------------------|---|---|--|
|                                 | <ul style="list-style-type: none"> <li>- Transferring energy &amp; power</li> <li>- Static charge</li> <li>- Electric fields</li> </ul>   | <ul style="list-style-type: none"> <li>-Plot and draw appropriate graphs selecting appropriate scales for the axes.</li> <li>- Lines of best fit</li> <li>- Method writing and identifying variables</li> <li>- Linking ideas between forces and Electric Fields</li> <li>-Linking to Magnets from KS3</li> </ul> | <ul style="list-style-type: none"> <li>- PPQ</li> <li>-AfL throughout lessons</li> <li>- Homework Tasks</li> <li>- Calculation Questions</li> <li>-Assessment 1</li> <li>-Assessment 2</li> <li>-Mocks</li> <li>-Required Practical 4-</li> <li>Resistance of Components</li> </ul>  |
| <b>Energy</b>                   | <ul style="list-style-type: none"> <li>- Calculations using work done, GPE, KE and EPE equations</li> <li>- Energy as a quantity that can be calculated</li> </ul>  | <ul style="list-style-type: none"> <li>-Use of increasingly complex formulae in calculations (e.g. squared terms)</li> <li>- Calculations involving rearranging (now including the need to use the square-root function)</li> <li>- Use of correct units</li> </ul>   | <ul style="list-style-type: none"> <li>- starter tasks interleaving previous knowledge from last lesson/ year 9 content retrieval</li> <li>- PPQ</li> <li>-AfL throughout lessons</li> <li>- Homework Tasks</li> <li>- Calculation for GPE, KE and EP</li> <li>-Assessment 1</li> <li>-Assessment 2</li> <li>-Mocks</li> </ul> |
| <b>Particle Model of Matter</b> | <ul style="list-style-type: none"> <li>-Using the particle model of matter explain motion of particles in a gas.</li> <li>-How gases exert forces on the walls of their containers.</li> <li>-How changing the temperature of a gas affects the pressure exerted</li> <li>-How changing the pressure of a gas affects the volume of the gas (and vice versa).</li> <li>-How pressure and volume of a gas are linked. (Boyle's Law)</li> </ul> | <ul style="list-style-type: none"> <li>-Graph plotting and choice of appropriate scale (e.g. y axis does not need to start at 0)</li> <li>-Explanatory answers needing to be in appropriate depth for the number of marks on offer</li> </ul>   | <ul style="list-style-type: none"> <li>- Analysis of practical results</li> <li>- PPQ</li> <li>-Homework</li> <li>- Modelling and graph interpretation</li> <li>- Graph analysis</li> <li>- starter tasks interleaving previous knowledge from last lesson/ year 9 content retrieval</li> <li>- PPQ</li> </ul>                 |

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|                     |   |   |  |
|---------------------|---|---|--|
|                     | <ul style="list-style-type: none"> <li>-Work done on a gas and the change in internal energy caused</li> </ul>  |   | <ul style="list-style-type: none"> <li>-AfL throughout lessons</li> <li>- Homework Tasks</li> <li>-Assessment 1</li> <li>-Assessment 2</li> <li>-Mocks</li> </ul>  |
| <p><b>Waves</b></p> | <ul style="list-style-type: none"> <li>- Transverse &amp; longitudinal waves</li> <li>- Properties of waves &amp; wave speed</li> <li>- Frequency &amp; Time Period</li> <li>- Required practical 8 -Speed of a wave in a solid &amp; in a ripple tank (in 2 parts)</li> <li>-Sound waves               <ul style="list-style-type: none"> <li>- Waves for detection and exploration</li> </ul> </li> <li>- Ultrasound waves &amp; their use               <ul style="list-style-type: none"> <li>- Seismic waves and their part in discoveries about the Earth's structure</li> </ul> </li> <li>- Required practical 9 – reflection &amp; refraction of light - Reflection of waves</li> <li>- Refraction of waves</li> <li>- Lenses</li> <li>- Opaque, transparent &amp; translucent objects               <ul style="list-style-type: none"> <li>- Use of coloured filters</li> <li>- Colours of light and their perception to the human brain</li> </ul> </li> <li>- Uses of dangers of EM Waves</li> </ul> | <ul style="list-style-type: none"> <li>- Recall key terminology on the anatomy &amp; behaviour of waves</li> <li>- Identify the suitability of apparatus to measure the frequency, wavelength &amp; speed of waves (in the required practical)</li> <li>- Be able to determine the uncertainty in a set of measurements</li> <li>- Calculations &amp; equation recall from an ever-increasing list</li> <li>- Draw ray diagrams to show reflection of waves</li> <li>- Draw ray diagrams to show refraction of waves</li> <li>- Draw wave front diagrams to illustrate refraction</li> <li>- Construct ray diagrams to illustrate the similarities and differences between convex and concave lenses</li> <li>- Recall key terminology used to describe images (e.g. real &amp; virtual; upright &amp; inverted)</li> <li>- Recall key terminology related to the absorption &amp; transmission of light (opaque, transparent &amp; translucent)</li> <li>- Explain the perception of colour due to the absorption, transmission and reflection of different wavelengths of light</li> <li>-State the order of the EM waves and their magnitudes</li> </ul> | <ul style="list-style-type: none"> <li>- Analysis of practical results</li> <li>- PPQ</li> <li>-Homework</li> <li>- Ray Diagrams</li> <li>- Graph analysis</li> <li>- starter tasks interleaving previous knowledge from last lesson/ year 9 content retrieval</li> <li>- PPQ</li> <li>- Calculations of Uncertainty</li> <li>-AfL throughout lessons</li> <li>- Homework Tasks</li> <li>- Analysis of Risk with Nuclear Forces</li> <li>-Assessment 1</li> <li>-Assessment 2</li> <li>-Mocks</li> <li>-Required Practical 8 – Properties of a Wave</li> </ul> |

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|---------------------------|---|---|--|
|                           |   | -Explain how the properties of the EM Waves is due to their frequency.  |  |
| <b>Space -Summer Work</b> | <p>Our solar system</p> <ul style="list-style-type: none"> <li>- The lifecycle of a star &amp; formation of the elements</li> <li>-Orbital motion, natural and artificial satellites</li> <li>- Red-shift &amp; its support of the Big Bang theory</li> </ul> | <ul style="list-style-type: none"> <li>- Connection to Atomic Structure and fusion</li> <li>- Explain how fusion processes lead to the formation of new elements</li> <li>- Connection to Forces (Newton's Laws) to explain the equilibrium between the gravitational collapse of a star and the expansion of a star due to fusion energy</li> <li>- Connection to Forces to explain how for circular orbits the force of gravity can lead to changing velocity but unchanged speed</li> <li>. - Connection to Waves to explain the observed increase in wavelength of light from galaxies that are moving away from the Earth</li> </ul> | <ul style="list-style-type: none"> <li>-Marking of Research and Tasks carried out at home.</li> <li>- Assessments</li> <li>- PPQ</li> <li>- Mocks</li> </ul> |