

## Year 10: Physics

|                                | Autumn 1  | Autumn 2  | Spring 1  | Spring 2  | Summer 1   | Summer 2  |
|--------------------------------|---|---|---|---|--|---|
| Topics                         | <p><b>P3 Particle model of Matter:</b> density, changes of state, internal energy, specific heat capacity</p> <p><b>Focus:</b> Describing energy changes and calculation involving energy</p>   | <p><b>P3 Particle model of Matter:</b> density, changes of state, internal energy, specific heat capacity</p> <p><b>Focus:</b> changing the subject of equations and memorising equations</p> | <p><b>P2 Electricity:</b> current, potential difference and resistance, series &amp; parallel circuits,</p> <p><b>Focus:</b> Practical skills including analysing/evaluating and memorising equations</p> | <p><b>P2 Electricity</b> domestic uses and safety, energy transfers (Triple: static electricity, then P8 Space Physics)</p> <p><b>Focus:</b> links (retrieval practice) to P1 Energy topic in Y9 and memorising equations</p> | <p><b>P4 Atomic Structure:</b> atoms, isotopes, nuclear radiation, hazards and uses (Triple: fission, fusion)</p> <p><b>Focus:</b> multi-step calculations and linking topics in analysing a problem</p> | <p><b>Review of the year:</b> Review of P1-4 content prior to the paper 1 end of year exam</p> <p><b>Focus:</b> developing exam technique and applicable maths/practical skills</p> |
| Assessments                    | All: mini assessment based on P3 up to lesson 5 only, but with an extended writing focus  | All: End of topic assessment based on P3 only, but with a maths skills focus  | Combined: Practical skills assessment based on the Electricity required practicals<br>Triple: Exam style assessment based on all content/skills covered to date in Y9/10                                  | Combined: Exam style assessment based on all content/skills covered to date in Y9/10<br>Triple: Assessment based on P8 Space Physics  | Assessment based on content/skills covered in P4 only  | Mock paper style assessment based on P1-3 topics covered in Y9/10   |
| Building on Prior Learning     | <p><b>Substantive Knowledge</b> – From Year 9 students will use their knowledge of energy to develop ideas about electricity and the heating/cooling of matter. Ideas relating to the particle model studied in both Key Stage 3 and Chemistry will first be used (in their simplest form) to explain the properties of materials when being heated/cooled. The same model will then be developed further and used to explain nuclear decay.</p> <p><b>Disciplinary/procedural Knowledge</b> – Students will develop their ability to use equations in performing basic calculations from Year 9 to solving more complex problems. This includes both changing the subject of the equation and performing multi-step calculations involving more than one equation from multiple topic areas. Practical skills will be developed further with an emphasis on analysing/evaluating experiments along with the development &amp; use of the technical language of scientific enquiry.</p> |   |   |   |  |   |
| Cultural Capital               | <p><b>There is cultural capital in abundance in this programme of study:</b> Students will learn about the development of several scientific models over time, in particular the particle model and the big bang theory. This will include an appreciation of the impact they have had on modern society, for example nuclear power and the use of radiotherapy to treat hyperthyroidism. Students will look at historical examples of the misuse of the applications of Science, such as the poisoning of Litvinenko and the Chernobyl disaster.</p>   |   |   |   |  |   |
| Mastery                        | <p><b>In terms of mastery</b> students will be given opportunities to apply their Physics knowledge through increasingly varied and complex contexts &amp; scenarios. After initially being shown how to change the subject of equations and complete multi-step calculations through worked examples &amp; modelling good practice, students will be given a range of opportunities to demonstrate their ability, both in lesson and through formal assessment. They will use increasingly technical language when analysing and evaluating the results of the required practical experiments that they carry out in year 10 and will be challenged to link the knowledge they have developed across a range of topics together in order to enable them to give a fuller explanation of physical phenomena.</p>  |   |   |   |  |   |
| Development of Character       | <p><b>A wide range of virtues are covered through the teaching of Physics:</b> The intellectual virtues of curiosity and resilience are explored through the teaching of the Big Bang theory. Collaborative working and honesty are important to the scientific method and development/acceptance of new ideas. These will be covered throughout Year 10.</p>   |   |   |   |  |   |
| Extra-Curricular opportunities | <p><b>In School: STEM Club</b> (across all 3 science)<br/><b>Outside of School: Science Live GCSE Event</b> in Birmingham</p>   |   |   |   |  |   |
| Metacognitive Learning         | <p>Students will initially be shown how to approach the more complex mathematical calculations of Year 10, through modelling as well as the use of a systematic approach, which is then repeated often so it becomes almost automatic. Over the course of the year increasingly more complex/varied scenarios will be used together with a gradual reduction of scaffolding/assistance in order to develop independence and resilience. Students will be guided both through teacher/peer feedback to both respond to and set their own targets to help further their progress.</p>   |   |   |   |  |   |

