**Y10 – Separate Science (Physics)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | | Summer 1 | Summer 2 |
| Big Ideas | P3b\* Atomic structure  P4\* Energy | P4\* Energy  P5\* Forces | P5 \*Forces | P5 \*Forces  P6 \*Waves | | P6 \*Waves | Exam skill and prior knowledge development |
| Topics | Fission  Fusion  Irradiation and contamination  Background radiation  Energy stores | Potential and kinetic energy  Conservation of energy  Vector and scalar quantities | Springs and Hooke’s Law  Graphs of motion  Acceleration  Newton’s Laws | Pressure  Moments  Transverse and longitudinal  Wave speed | | Electromagnetic spectrum  Waves at boundaries  Uses and dangers of electromagnetic waves | Topics based on progress over time for each class personalised by teacher |
| Skills | DEVELOPMENT OF SCIENTIFIC THINKING  - Understanding how scientific theories develop over time  - Use a variety of models to represent ideas  - Appreciate ethical issues  - Describe and evaluate methods  - Recognise the importance of peer review | | EXPERIMENTAL SKILLS & STRATEGIES  -Plan investigations  - Carry out investigations  - Describe and suggest techniques  - Mathematical and statistical analysis | | | APPARATUS & TECHNIQUES  -Use a range of equipment to take measurements  - Safe use of heating equipment  - Use a range of equipment to measure the effect of forces and motion  - Measure energy transfers and waves | |
| Assessment | Formative assessment every lesson.  Range of learning & skill-based homework.  Synoptic end of unit assessments | Formative assessment every lesson.  Range of learning & skill-based homework.  Synoptic end of unit assessments | Formative assessment every lesson.  Range of learning & skill-based homework.  Synoptic end of unit assessments | Formative assessment every lesson.  Range of learning & skill-based homework.  Synoptic end of unit assessments | | Formative assessment every lesson.  Range of learning & skill-based homework.  Synoptic end of unit assessments | Formative assessment every lesson.  Range of learning & skill-based homework.  Synoptic end of unit assessments  Paper 1 END OF YEAR ASSESSMENT |
| Linked learning | Pupils will have knowledge of the fundamental ideas of physics such as electricity, energy, and atomic structure. Working scientifically skills relating to methodology, variables, apparatus and collecting data. Learning components at the start of the lesson remind students of prior learning and point out links to previous topics.  Links with other subjects: Maths – 30% of the science GCSE is based on the basic mathematical functions and skills necessary for equations, rearranging equations, and standard form. English – reading, writing and communication. MFL – support with the development of learning an additional language for scientific literacy. Chemistry – consolidates knowledge of atomic structure, isotopes, and ions. Biology and Physics – consolidate working scientifically skills and scientific literacy. | | | | | | |
| \*SMSC Links | 253 Provision for the spiritual development of pupils includes developing their:  - ability to be reflective about their own beliefs and perspective on life  - sense of enjoyment and fascination in learning about themselves, others, and the world around them,  - Use of imagination and creativity in their learning  254 Provision for the moral development of pupils includes developing their:  -understanding of the consequences of their behaviour and actions  - interest in investigating and offering reasoned views about moral and ethical issues and ability to understand and appreciate the viewpoints of others on these issues | | | | | | |
| Literacy | Scientific vocabulary, terminology, and definition  Interpret observations, write conclusions, describe, and explain common concepts, compare, and evaluate | | | Numeracy | Use decimal forms, standard form, ratios, fractions, percentages, makes estimates, uncertainties, determining quantities, SI units, convert units,  Handling data: interpret data, significant figures, construct tables and graphs, order of magnitude, scatter diagrams, calculate means.  Algebra: use common expressions, solve simple algebraic equations, rearrange equations, substitute numbers  Graphs: translate information between tables and graphs, understand linear relationships, plot variables, calculate surface area and volume | | |
| Enrichment | Period 6 CLIMB sessions.  IOP lecture trips to the University of Birmingham  GCSE Science Live trips!  Developing STEM ambassador visits to engage and inspire students | | | | | | |
| Impact | Physicists demonstrate the ability to investigate problems and identify relationships as well as use precise language to describe experimental uncertainty. Learning from their mistakes, successful students will apply prior learning and organised through to work through problems, looking to find solutions rather than giving up. Science will help students to become logical thinkers and problem solvers with a batter understanding of the world around them. Demonstrating resilience and the ability to consider moral and ethical implications of scientific developments. | | | | | | |

|  |
| --- |
| Ways to support student learning in this subject |
| * Encourage the completion of homework. * Encourage discussion of science issues that arise in the news. * Discuss science lessons and their progress. * Encourage a positive attitude towards science. * Encourage self-assessment and reflection using personalised learning checklists (PLCs) * Practice units, unit conversions, standard form, rearranging equations and encourage the use of a calculator * Use of low stakes questioning and exam material to build confidence and knowledge base * Encourage students to use GCSEPod to consolidate knowledge and build on recall skills * Refer students to LaunchPad revision materials * Purchase CGP revision guides and workbooks for independent revision and practice |