## SUBJECT: SCIENCE

| Year Group | **YEAR 9** | | | | | |
|---|---|---|---|---|---|---|
| **Rationale** | Year 9 will begin to cover the fundamental ideas needed for GCSE science. During the year students will reinforce the knowledge that they have gained in years 7 and 8 and focus on building on these key ideas to ensure a good foundation for the Key Stage 4 GCSE in the combined or separate sciences. Students will study an equal mix of biology, chemistry and physics with the skills of working scientifically embedded throughout. Pupils work through the units in rotation during the course of the year. | | | | | |
| | **Autumn Term 1** | **Autumn Term 2** | **Spring Term 1** | **Spring Term 2** | **Summer Term 1** | **Summer Term 2** |
| **Topic/Unit** | Biology Unit 1: Cells & Organisation | Chemistry Unit 1: Atomic Structure & Separation Techniques | Physics Unit 1: Heat and Electrical Energy Transfers | Biology Unit 2: Infection, Photosynthesis & Respiration | Chemistry Unit 2: Periodic Table & Chemical Reactions | Physics Unit 2: Forces and Motion |
| **Knowledge** | – Cells, Tissues and Organs<br>– Microscopes & Magnification<br>– Specialised Cells<br>– Blood<br>– Blood Vessels<br>– The Heart<br>– Heart Problems<br>– Breathing & Gas Exchange | – Elements and Atoms<br>– Atomic Structure<br>– Chemical Formula<br>– Relative Formula Mass<br>– Simple Distillation<br>– Filtration & Crystallisation<br>– Chromatography & Rf Values | – Temperature<br>– Change of State<br>– Internal Energy<br>– Thermal Conductivity<br>– Efficiency<br>– Energy Resources<br>– National Grid<br>– Electrical Energy Transfer<br>– Electrical Energy Cost | – Communicable Diseases<br>– Defence against Disease<br>– Vaccination<br>– Developing Drugs<br>– Photosynthesis<br>– Plant Diseases<br>– Respiration | – Periodic Table<br>– Forming Ions<br>– Ionic Bonding<br>– Acids and Bases<br>– Group 1 Metal Reactions<br>– Covalent Bonding<br>– Balancing Symbol Equations | – Resultant Forces<br>– Speed<br>– Distance-Time Graphs<br>– Acceleration<br>– Newton's Laws<br>– Weight<br>– Moments<br>– Hooke's Law<br>– Pressure<br>– Density |
| **Skills** | Pupils will continue to develop their working scientifically skills through carrying out investigative work to help them describe how microscopes are used and how the circulatory and breathing system function. Pupils will develop their numeracy skills through developing their understanding of the use of the prefixes milli- and mcro- and how to convert between units of measurement. | Pupils will continue to develop their working scientifically skills through carrying out investigative work to help them separate mixtures through the processes of distillation, filtration, crystallisation and chromatography. Pupils will develop their numeracy skills by calculating relative formula mass and using data from chromatography experiments to calculate Rf values. | Pupils will continue to develop their working scientifically skills through carrying out work to investigate different energy resources and how electricity can be generated. Pupils will develop their numeracy skills as they develop their use of some of the key physics equations and carry out calculations involving energy transfers, power and efficiency. | Pupils will continue to develop their working scientifically skills through carrying out work to investigate how communicable diseases are spread and how new drugs are developed. Pupils will develop their numeracy skills through analysis of data and describing what data shows. | Pupils will continue to develop their working scientifically skills through carrying out investigative work to describe and explain the reactivity of group one metals. Pupils will develop their numeracy skills through developing their understanding of what ions are and how they are formed and by balancing symbol equations. Pupils will also be able to relate an atom's position in the periodic table to its electronic structure. | Pupils will continue to develop their working scientifically skills through carrying out work to investigate forces, moments, Hooke's Law and acceleration. Pupils will develop their numeracy skills as they develop their use of some of the key equations in physics. |
| **Assess-ments** | **Assessment**: Cells & Organisation Exam Style Questions Assessment | **Assessment**: Atomic Structure & Separation Techniques Exam Style Questions Assessment | **Assessment**: Heat and Electrical Energy Transfers Exam Style | **Assessment**: infection & Response Exam Style Questions Assessment | **Assessment**: Periodic Table & Bonding Exam Style Questions Assessment | **Assessment**: Forces and Motion Exam Style Questions Assessment **End of Year 9 Exam:** |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | Questions Assessment | | | Pupils complete a 90 minute examination paper assessing their knowledge and understanding of all the content studied throughout the course of year nine. |