



The curriculum for this stage of students' education has been designed to ensure students understand how scientific methods and theories develop over time. Building on work done in Year 9 Chemistry, they will use representational, spatial, descriptive, computational and mathematical models to solve problems, make predictions and to develop scientific explanations and understanding. Students will appreciate the power and limitations of science and be able to consider ethical issues which may arise. They will be able to explain the technological applications of science; evaluate associated personal, social, economic and environmental implications; and make decisions based on the evaluation of evidence and arguments. Students will evaluate risks both in practical science and the wider societal context, while recognising the importance of peer review of results and of communicating results to a range of audiences.

<p>HALF TERM 1: CHEMICAL CHANGES</p> <p>STUDENTS MUST KNOW:</p> <ul style="list-style-type: none"> pH and Neutralisation, Strong and Weak acids, Making Salts from Metals, Metal oxides, Metal Hydroxides, and Carbonates, Making and separating soluble and insoluble salts, The Reactivity Series. Metal reactions and extraction. Redox reactions, Electrolysis, Writing Half-equations, Predicting the products of electrolysis (CuSO₄ and NaCl). <p>RP8- Making a soluble salt from insoluble oxide or carbonate RP9 – Electrolysis of an aqueous solution</p> <p>HOW THIS WILL BE ASSESSED: A Progress Test halfway through the topic to address misconceptions, followed by an assessment completed at the end of each topic.</p>	<p>HALF TERM 2: ENERGY CHANGES AND RATES OF CHANGE</p> <p>STUDENTS MUST KNOW:</p> <ul style="list-style-type: none"> Monitoring Chemical Reactions, Exothermic and Endothermic reactions, Calculating Bond energies, Collision theory, Factors affecting the Rate of a Chemical reactions (Temperature, Concentration, Surface area, Catalysts), Rate graphs, Reversible Reactions and Le Chateliers Principle. <p>RP10- Energy transfer of reactions</p> <p>HOW THIS WILL BE ASSESSED: A Progress Test halfway through the topic to address misconceptions, followed by an assessment completed at the end of each topic.</p>	<p>HALF TERM 3: ENERGY CHANGES AND RATES OF CHANGE</p> <p>STUDENTS MUST KNOW:</p> <ul style="list-style-type: none"> Monitoring Chemical Reactions, Exothermic and Endothermic reactions, Calculating Bond energies, Collision theory, Factors affecting the Rate of a Chemical reactions (Temperature, Concentration, Surface area, Catalysts), Rate graphs, Reversible Reactions and Le Chateliers Principle. <p>RP 11 – Effect of concentration on the rate of reaction</p> <p>HOW THIS WILL BE ASSESSED: A Progress Test halfway through the topic to address misconceptions, followed by an assessment completed at the end of each topic.</p>
<p>HALF TERM 4: ORGANIC CHEMISTRY</p> <p>STUDENTS MUST KNOW:</p> <ul style="list-style-type: none"> The development of Crude Oil, Separation, Properties and uses of Crude oil fractions, Alkanes and Alkenes, Complete and Incomplete combustion, Cracking. <p>HOW THIS WILL BE ASSESSED: A Progress Test halfway through the topic to address misconceptions, followed by an assessment completed at the end of each topic.</p>	<p>HALF TERM 5: CHEMICAL ANALYSIS</p> <p>STUDENTS MUST KNOW:</p> <ul style="list-style-type: none"> What defines Purity and a Formulation, Paper chromatography and calculating R_f, How the R_f is used in analysis, Testing for Gases (Cl₂, O₂, CO₂ and H₂), <p>RP 12 – Paper chromatography</p> <p>HOW THIS WILL BE ASSESSED: A Progress Test halfway through the topic to address misconceptions, followed by an assessment completed at the end of each topic.</p>	<p>HALF TERM 6: CHEMISTRY OF THE ATMOSPHERE</p> <p>STUDENTS MUST KNOW:</p> <ul style="list-style-type: none"> The Greenhouse Gases and their effect on Global warming and Climate change, Reducing Carbon footprints, Atmospheric pollutants and their effects on the environment. <p>HOW THIS WILL BE ASSESSED: A Progress Test halfway through the topic to address misconceptions, followed by an assessment completed at the end of each topic.</p>



Embedding this knowledge can be supported at home by completion of homework, reviewing topics found on BBC Bitesize (AQA Chemistry), GCSE pod and reading scientific articles in newspapers, magazines, scientific journals and periodicals. **Books of interest:** The Science of Everyday Life: Why Teapots Dribble, Toast Burns and Light Bulbs Shine (Hardback) Marty Jopson ISBN-10: 1782434186. Further enrichment activities could include trips to the Big Bang Science Fair, Science Live or the Thinktank.



The curriculum for this stage of students' education has been designed to build upon their prior knowledge from year 9 Physics. This course provides a worthwhile background for all students, whether or not they intend to go on to study Physics beyond GCSE. The course enables students to acquire a body of scientific knowledge and develop an understanding of the ideas and applications of Physics e.g. Energy, Forces and Motion, Waves and the Electromagnetic Spectrum. This is set in the context of knowing and understanding a body of scientific facts. Students acquire an understanding and experience of the methods used in science and of the application of experimental techniques in everyday life.

<p>HALF TERM 1: Energy</p> <p>STUDENTS MUST KNOW:</p> <ul style="list-style-type: none"> Changes in Energy Stores. To understand energy, its different types and how it transfers between different energy types. Energy and Work. To define work done. Kinetic and Gravitational Potential Energy. To understand the factors that affect kinetic and gravitational potential energy and how it can be calculated. Energy Efficiency. To understand the factors affecting efficiency and how to calculate percentage efficiency. Energy and Power. Energy Transfer by Conduction. <p>REQUIRED PRACTICAL 1 Investigation to determine the specific heat capacity of one or more materials.</p> <p>HOW THIS WILL BE ASSESSED: Students will be assessed by a progress test half way through the topic as well as an end of topic assessment.</p>	<p>HALF TERM 2: Energy Cont.</p> <p>STUDENTS MUST KNOW:</p> <ul style="list-style-type: none"> Infrared Radiation. To understand what infrared radiation is and how it is detected (T). Heating and Insulation Buildings. To understand how homes are heated and how to reduce the cost of heating homes (T). Energy Demands. To identify the advantages and disadvantages of Fossil Fuels, Nuclear Fuels and Biomass energy generation. Energy from Wind, Water, Sun and Earth. To describe the advantages and disadvantages of renewable energy sources. Energy and the Environment. <p>HOW THIS WILL BE ASSESSED: Students will be assessed by a progress test half way through the topic as well as an end of topic assessment.</p>	<p>HALF TERM 3: Forces and Motion</p> <p>STUDENTS MUST KNOW:</p> <ul style="list-style-type: none"> Vectors and Scalars. How to represent, interpret and draw vectors. Forces between Objects. What happens to the force between two objects when they interact/ touch? Moments at Work. To understand how the turning effect of a force is called the moment of force and how levers act as force multipliers with turning moments applied to gears (T). Centre of Mass. How to determine the centre of mass of an object and the equilibrium of a suspended object. Resolution of Forces. Acceleration, Velocity and Distance Time Graphs. <p>HOW THIS WILL BE ASSESSED: Students will be assessed by a progress test half way through the topic as well as an end of topic assessment.</p>
<p>HALF TERM 4: Forces and Motion Cont.</p> <p>STUDENTS MUST KNOW:</p> <ul style="list-style-type: none"> Force and Acceleration. To understand how much force is needed to change an objects motion. Acceleration Investigation. To investigate the acceleration of a system with a constant mass and varying mass. Braking Forces and Momentum. To understand the factors influencing the stopping distance of a car. Weight and Terminal Velocity. To describe the motion of a falling object in a fluid under the effect of gravity. <p>HOW THIS WILL BE ASSESSED: Students will be assessed by a progress test half way through the topic as well as an end of topic assessment.</p>	<p>HALF TERM 5: Forces and Motion Cont.</p> <ul style="list-style-type: none"> Forces and Elasticity. To understand the limitations of Hooke's law and how it can be Applied Force vs Extension graphs and be interpreted Elasticity Investigation. To investigate the relationship of force and extension of a spring. Pressure and Surfaces/Liquids. To understand how pressure acts on surfaces and how pressure acts in liquids (T). Atmospheric Pressure. To understand how atmospheric pressure and density changes with altitude (T). Upthrust and Flotation.(T). <p>REQUIRED PRACTICAL 6 – Investigate the relationship between force and extension for a spring.</p> <p>REQUIRED PRACTICAL 8 – Investigate the effect of varying the force on the acceleration of an object</p> <p>HOW THIS WILL BE ASSESSED: Students will be assessed by a progress test half way through the topic as well as an end of topic assessment.</p>	<p>HALF TERM 6: Waves</p> <p>STUDENTS MUST KNOW:</p> <ul style="list-style-type: none"> The Nature and Properties of Waves. To be able to identify transverse and longitudinal wave and describe how they transfer energy using a particle motion model identifying wavelength and frequency to calculate the speed of a wave. Reflection and Refraction. To be able to describe the effects of reflection and refraction. Reflection Investigation. <p>REQUIRED PRACTICAL 6 – Make observations to identify the suitability of apparatus to measure the frequency, wavelength and speed of waves.</p> <p>HOW THIS WILL BE ASSESSED: Students will be assessed by a progress test half way through the topic as well as an end of topic assessment.</p>

Embedding this knowledge can be supported at home by reviewing class notes, guided learning wider reading, exam practice questions, independent research and study, completing set independent study tasks, watching in scientific documentaries and understanding current issues in the scientific world. In addition, use the AQA website, BBC Bitesize and GCSEPOD in conjunction with suitable revision guides.