

# Science

## KS3

Year 7		Year 8		Year 9	
<b>HT1:</b> <i>* RP = required practical</i>	<b>HT2:</b> <b>Passport to Science, Cells, Plants &amp; Human Biology:</b> This unit of 8 lessons supplements pupils' KS2 science knowledge, providing pupils with all the practical and health & safety skills needed to undertake laboratory work. Cells, Plants & Human Biology comprises 17 lessons covering cells, microscopes RP*, organ systems, building blocks of life, puberty & pregnancy.	<b>HT1:</b> <b>Diet, digestion and the nervous system:</b> Pupils build upon their learning in Year 7, HT2 in 11 lessons covering diet, the elements and functions of the digestive system and how our nervous system helps us to respond to stimuli in the world around us.	<b>HT2:</b> <b>The Periodic Table and Chemical Reactions:</b> Across 18 lessons, pupils build upon learning from Year 7, HT3, exploring the development and use of the periodic table and the reactions of the compounds and elements recorded in it.	<b>HT1:</b> <b>Energy:</b> Through the course of this 18-lesson unit, pupils learn about the completely new concepts of energy stores and pathways. Pupils also learn about calculations and energy transfers.	<b>HT2:</b> <b>Plants and Ecosystems:</b> The content of this 16-lesson unit is completely new to pupils but has links to the Cells unit in Year 7. During this unit, pupils learn about the process of photosynthesis and its purpose as well as the environment around us and the impact we have upon it.
<b>HT 3:</b> <b>Elements, compounds and separating mixtures:</b> In this 10 lesson unit pupils learn about elements, compounds, mixtures and how to separate them using scientific techniques.	<b>HT 4:</b> <b>Electricity and magnetism:</b> Over 15 lessons, pupils explore all aspects of circuits and the associated components, including equations, and then move on, through linked concepts to the study of magnetism. During March pupils access a wide range of experiential, careers and extra-curricular opportunities through the science elements of the school's STEM week.	<b>HT 3:</b> <b>Sound and Light:</b> In this substantial unit of 15 lessons, pupils learn how light and sound travel to us and how they can be used.	<b>HT 4:</b> <b>Circulatory and Respiratory Systems and Microbes:</b> This 15-lesson unit builds upon Year 8 HT 1, exploring further organ systems in the body. Pupils learn what the circulatory and respiratory systems are composed of and how they work. Pupils explore the ways our body creates energy and how microbes enter and affect us.	<b>HT 3:</b> <b>Variation and Selection:</b> Pupils learn about inheritance and environmental factors in this new unit of 15 lessons. Pupils draw upon learning about reproduction from Year 7. Physical features of inheritance and environment are explored, as are diseases.	<b>HT 4:</b> <b>Forces and Waves:</b> This unit links to the subject matter studied in Year 7 HT5 and Year 8 HT3. Over 14 lessons, it builds upon pupils' understanding of forces, as well as the sound and light topic. Incorporating 3 lessons on pressure, the unit also introduces pupils to motors and the electromagnetic spectrum.
<b>HT 5:</b> <b>Forces and motion:</b> Over the course of 16 lessons, pupils learn what forces are and how we use them. Pupils develop skill in calculations and relate learning to everyday life.  Pupils attempt an end of year assessment.	<b>HT 6:</b> <b>Acids and alkalis:</b> This 8-lesson unit enables pupils to learn about acids and alkalis. Pupils develop an understanding of the definition of acids and alkalis, as well as their properties and how they can be used.	<b>HT 5:</b> <b>Physical Changes:</b>  This unit of 15 lessons provides pupils with the opportunity to learn about states of matter and to understand the changes between them.  Pupils attempt an end of year assessment.	<b>HT 6:</b> <b>Earth Resources and Reactions of metals:</b>  Over 12 lessons, this unit covers the development of the atmosphere, and how metals react with acids, water and with other chemicals.	<b>HT 5:</b> <b>Space:</b> This 10-lesson unit introduces a brand new topic aimed at separate scientists only. In it, pupils learn about space and the evolution and death of stars.  Those pupils who will be pursuing the Trilogy course revisit and consolidate learning from KS3 and begin to explore the building blocks for GCSE.	<b>HT 6:</b> <b>Periodic Table, Cells and The Particle Model:</b> Pupils build on KS3 prior learning and begin to explore the building blocks of each discipline.

## Science

### KS4 Trilogy GCSE

Year 10		Year 11	
<b>HT1:</b> <b>The Periodic Table, Cells and The Particle Model:</b> Pupils build on KS3 prior learning and begin to explore the building blocks of each discipline.	<b>HT2:</b> <b>System Organisation, Energy:</b> Learning moves from micro to macro scale in this unit as, in multicellular organisms, cells make tissues, which make organs, which make systems. The energy unit links with the particle model, providing a basis for chemistry units (bonding, energy changes), the biology unit (bioenergetics) & many physics units.	<b>HT1:</b> <b>Quantitative Chemistry, Examination Preparation:</b> In this unit, pupils revisit and consolidate learning of quantitative chemistry. Pupils then revisit prior learning and undertake examination practice in readiness for the end of year examination, which covers all three disciplines of science.	<b>HT2:</b> <b>Chemical Analysis, Waves, Homeostasis:</b> Pupils build upon a basic understanding of definitions and properties of atoms, compounds & mixtures. Further learning about waves develops understanding of physics and links to the unit on magnetism. Pupils also explore homeostasis, recapping understanding of cells & organisation, introducing a new organ system as the context to this learning.
<b>HT 3:</b> <b>Structure and Bonding, Energy Changes:</b> Pupils link concepts from atomic structure, the particle model and energy in this unit on structure & bonding, which will be built upon in the electricity and many other chemistry units. Pupils' learning about energy changes is largely practical, emphasising variables and how to conduct a scientific experiment – skills which can be applied to the rest of the RPs. Infection and Response – Timely as it takes place in a half term when illness is rife.	<b>HT 4:</b> <b>Electricity:</b> Pupils learn about electricity before moving on to explore chemical changes and focusing on electrolysis. Pupils' learning on chemical changes builds on knowledge of reactivity from work on atoms, as well as understanding of ionic compounds from the structure and bonding unit.	<b>HT 3:</b> <b>Using Resources, Inheritance &amp; Selection, Chemistry of the Atmosphere:</b> Pupils apply learning of quantitative chemistry & chemical changes to consider our use of resources. Work on inheritance & selection builds from Paper 1 towards the study of ecology. Pupils explore the chemistry of the atmosphere, which links to resources, and to future study of ecology in biology.	<b>HT 4:</b> <b>Rates, Magnetism &amp; Electromagnetism, Ecology:</b> This unit places strong focus on the language of the scientist and on required practicals. The difficult, abstract concepts of magnetism & electromagnetism are interleaved with more concrete concepts to maintain pupils' engagement. Pupils study ecology, (including RP), exploring the world in which we live and how every organism interlinks.
<b>HT 5:</b> <b>Atomic Structure and Radiation, Bioenergetics:</b> Interleaving of prior learning consolidates pupils' knowledge of the structure of the atom, an abstract concept pupils find difficult. Pupils then build upon knowledge of chemical and energy changes to learn about equations and exo/endothemic reactions. Pupils also extend learning from cells to develop greater understanding of chloroplasts & mitochondria.	<b>HT 6:</b> <b>Quantitative Chemistry:</b> Conceptually, this is the most challenging maths learning within science. Pupils engage in it at this point to link effectively with their increasing mathematical knowledge and maturity. Learning links to atoms & compounds and builds on the periodic table & chemical reactions. Pupils explore formula mass, mole equation and titration calculations.	<b>HT 5:</b> <b>Forces, Organic Chemistry, Space (Physics only):</b> Pupils learn about forces. For single scientists, this is a large proportion of Physics Paper 2. In this unit, there is a clear emphasis on securing knowledge and recall. Work on organic chemistry recaps and builds upon learning from Year 10 and links to A Level. The study of space, for single scientists only, also builds upon earlier work on forces.	<b>HT 6:</b> <b>Examination preparation:</b> Pupils engage in revisiting prior learning to secure and consolidate skills and knowledge, attempting practice papers to build confidence and fluency.

### Notes

'Pupils taking the separate science route cover the same topics as the combined science pupils, with the addition of the physics unit 'Space' at the end of year 11. In all other units the separate science pupils study the topics in greater detail, as specified by AQA.'