



## SUBJECT & QUALIFICATION:

### AQA Level 1/Level 2 GCSE (9-1) in Combined Science: Trilogy

#### Why is the study of Combined Science important?

Have you ever wondered why the sky is blue? If there are more than 118 elements? Whether there are more undiscovered species of plant or animal? What would the nearest adult answer if you posed these questions? Could they be answered by the brightest minds in science? The curiosity that lies behind these questions and the drive to find the answers is what makes us human and it lies in the heart of Science.

Answering questions is essentially the whole purpose of science and answering these questions simply brings more questions to the surface. Great scientists, those at the very frontier of what we understand as science knowledge, would still declare that the more we understand about the universe, the more there is to find out. How great is that?

The concise Oxford dictionary defines science as 'systematic and formulated knowledge' that is based on mainly observation, experiment and induction'. Science consists of the interrelated discipline of knowledge (substantive knowledge) and skills (disciplinary knowledge) - but those of us who have ever questioned the world around us see it as so much more than that. Through science you can learn to develop your own ideas, attitudes and interpretations and not simply acquire a set of skills and knowledge. Throughout our science curriculum you'll see that science substantive and disciplinary knowledge are important but it's the application of these ideas that lead onto the great discoveries. Let's get to discovering...

Understanding the scientific process is a way of thinking and working. Science begins with curiosity and daring to ask questions, seek answers, work through problems and arrive at conclusions. All of which require logical thought and a systematic way of working. A process that is applicable to most scenarios in life! Want to think like a scientist?

Science is an active process. From Year 7 we have planned a range of relevant and exciting scientific activities that involve the full range of all the aspects of science. We feel that to be able to think like a scientist you must understand the foundations that led us to our current understanding in the 21 century. To support this, we have allowed the opportunity to recreate the investigations of key scientists and to encourage you to try out your own ideas, where the outcomes are unknown and to prove the validity of a scientific fact or idea.

Our 3 year KS3 followed by a 2 year GCSE KS4 curriculum focuses on intertwining core substantive knowledge with subject specific disciplinary knowledge. It is our conviction that this will make science accessible for all, by enabling students a strong foundation in learning a body of knowledge to the products and practices of science. This will then allow students to understand and appreciate how that knowledge was derived, how it came to be discovered and accepted by the scientific community. In science knowledge is power with it you can unlock scientific thinking and processes.



### What skills will the study of Combined Science teach you?

You are a citizen in this world and you need to know how the natural and modern world works. It will teach you to...

- Understand theories that explain phenomena
- Apply basic ideas and models that support understanding
- Evaluate models and theories
- Present theories in mathematical form
- Recall quantitative relationships
- Derive quantitative relationships between various measured quantities
- Explain how theories are borne out by experiment.
- Apply experimental procedure and understand that it is a measure of success of a theory
- Present, interpret and evaluate experimental data
- Apply mathematical skills to solve problems
- Develop a deeper understanding of everyday experiences including the natural world and modern devices.

### What will you know and understand from your study of Combined Science?

#### What will you know and understand from your study of Science?

- Develop scientific knowledge and conceptual understanding of science
- Develop understanding of the nature, processes and method involved in science
- Develop and learn to apply observational, practical, modelling, enquiry and problem-solving skills, both in the laboratory, in the field and in other learning environments.
- Develop their ability to evaluate claims linked to biology through critical analysis of the methodology evidence and conclusions, both qualitatively and quantitatively.



### How can you deepen your understanding of Combined Science?

Study of any subject in our curriculum takes full advantage of links with other subject areas- we term these as interdisciplinary links and we make the most of them because we know that deep learning requires the transference of knowledge and skills from one topic of learning to another. Once you can transfer your learning across topics and subject areas then you are really mastering what you know and how to apply your understanding and skills.

Science encompasses Biology, Chemistry and Physics. You will learn methods of thinking and research that are widely applicable to other subject areas helping your thinking in all subjects. Any science relies heavily upon evidence to test predictions and theories. Through developing mathematical techniques as well as applying reasoning your skills to present and justify information can be applied to most careers and further education.

Across the teaching of subjects, teachers will refer to your learning in other areas such as Biology, Mathematics, Physics and Chemistry and this will help you to develop your understanding.

Our Science departments offer lots of great opportunities for you to really engage with this fabulous subject. Why not look out for the enrichment clubs on offer such as Science Club for KS3 students, with a different theme each half term (e.g. "cool chemistry" or "dissections"). We offer STEM events and activities that may include opportunities to visit local colleges and universities. There may be visits to science museums and events that celebrate great scientists and discoveries. We offer after school support sessions for GCSE students and work with other departments to enhance learning such as maths in science and geography in science. Get involved! Become a STEM researcher and obtain the CREST award; enhance your anatomical and physiological knowledge through enrichments such as dissection club.

### How are you assessed in Combined Science?

Throughout the 3-year Science and 2-year GCSE Combined Science course you are assessed using the below assessment objectives which ensure that you can cumulatively build your subject understanding in preparation for future GCSE and A Level study. There are regular assessment points each year that we term Praising Stars©. At GCSE we make informed predictions informed by our holistic assessment of your progress against the key assessment objectives and your aspirational GCSE targets. These are also the basis for any appropriate support and intervention.

#### **KS3 Assessments**

Each unit in KS3 will be assessed with a summative test that is split into 4 sections; (a and b) substantive knowledge of the learnt unit in the form of short answer and MCQ's; (c) disciplinary knowledge related to the learnt unit and (d) substantive knowledge of previous learnt units.



### **Key Assessment Objectives for GCSE Combined Science**

AO1: Demonstrate knowledge and understanding of:

- Scientific ideas
- Scientific techniques
- Scientific procedures

AO2: Apply knowledge and understanding of:

- Scientific ideas
- Scientific enquiry
- Scientific techniques and procedures
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AO3: Analyse information and ideas to:

- Interpret and evaluate
- Make judgements and draw conclusions
- Develop and improve experimental procedures.



2023-24 SCIENCE CURRICULUM PROGRESSION PATHWAY					
	Year 7	Year 8	Year 9	Year 10	Year 11
<b>Autumn 1</b>	Unit 1 - Introduction to Science Bridging the gap between KS2 and KS3 Unit 2 - Matter and Energy	Unit 6 - Plants, Ecology and Climate change	Unit 11 - Electricity and Magnetism	B1 - Cell Biology C1 - Atomic Structure P1 - Energy	B6 – Inheritance  C6 - Rate of Chemical Change  P5 - Forces
<b>Autumn 2</b>	Unit 2 - Matter and Energy  Unit 3 - Chemical Substances	Unit 7 – Forces	Unit 12 - Patterns and Materials	B2 - Organisation P2 - Electricity and Magnetism C2 - Bonding and Structure	B7 - Ecology  C7 - Organic Chemistry  P6 - Waves
<b>Spring 1</b>	Unit 3 - Chemical Substances  Unit 4 - Animal Organ Systems	Unit 8 - Chemical Reactions	Unit 13 - Health and Disease	C3 - Quantitative Chemistry  P3 - Particle Model of Matter	C8 – Chemical Analysis C9 – Chemistry of the Atmosphere P7 - Magnetism and Electromagnetism
<b>Spring 2</b>	Unit 4 - Animal Organ Systems	Unit 8 - Chemical Reactions	Unit 14 - Sustainability	B3 - Infection and Response C4 - Chemical Changes	C10 – Using Resources Masterclasses and Revision
<b>Summer 1</b>	Unit 4 - Animal Organ Systems Unit 5 - Space, Earth and Sustainability	Unit 9 - Cells, Evolution and Inheritance	End of KS3 assessments and consolidation	B4 - Bioenergetics C5 - Energy Changes P4 - Atomic Structure	Masterclasses and Revision
<b>Summer 2</b>	Unit 5 - Space, Earth and Sustainability	Unit 10 - Waves	Transition	B5 - Homeostasis and Response P5 - Forces	Revision