Science Department Curriculum Intent

Values that Underpin our Curriculum

Science Values statement

The aim of teaching science in our schools is to be curious about the world around us, to learn through scientific discovery, and to be scientists and innovators of the future whilst becoming well rounded individuals. We aim to encourage our pupils to develop a positive and practical approach to science. We also seek to develop key scientific skills, combine knowledge with practical application and establish cross-curricular links, where appropriate. We build understanding of the 'Big Ideas' in Science that are relevant to pupils' lives during and beyond Academy.

Science is a core GCSE subject as well as an essential requirement for most Science-based career routes. At KS4, depending on their academic ability, pupils will either study Combined Science or separate sciences. All pupils will study key aspects of Biology, Chemistry and Physics.

We Care	We Challenge	We Commit
we want our pupils to have a deep appreciation of the environment through understanding the impact of man on the earth and how they can develop themselves as responsible citizens who are mindful of their role and responsibility in preserving the earth through conscious efforts of sustainability through recycling and monitoring our carbon footprints, building eco-friendly cars, roads etc.	• We are ambitious for all pupils. We aim to encourage many pupils to study GCSE separate sciences with others accessing the subject at Combined Science Higher level. • Lessons have opportunity for pupils to challenge themselves and work on independent tasks. • We are committed to developing fluency in the spoken and written word for all pupils. We strive for automaticity at the end of each lesson. To achieve this, we promote a 'can do' attitude. • Regular retrieval quizzes at the beginning of lesson challenge pupils to recall and develop prior learning.	• We engage with STEM projects and encourage group competitions linked to science and other STEM subjects, including arranging trips to universities. • To get involved in as many national Campaigns as possible. One example being Black History Month.

Vision for KS3 and KS4 Curriculum

Key Stage 3

- Our curriculum has been developed from the evidence based research from Best Evidence Science Teaching in conjunction with York Science education group.
- Our Key Stage 3 curriculum builds on the skills, knowledge and understanding that pupils secured at Key Stage 2.
- We aim for our Key Stage 3 curriculum to set the foundation for KS4.
- We aim for students to confidently use and apply scientific language to their work.
- We aim to promote inquisitive learning through exploration of local and global scientific topics which are current and topical.
- We aim to address scientific misconceptions prior to KS4.
- The Science curriculum provides pupils with a solid foundation in understanding key aspects of its contribution to cultural capital. In Science (such as through studying the contribution made by key scientists, national institution etc.)
- Our Science curriculum provides pupils with an appreciation of subject integrity and interconnectedness so that they can build pathways for themselves that will enable them to explore and fulfil career aspirations.

Key Stage 4

- Our three year Key Stage 4 interleaved curriculum for Science allows us to cover content with sufficient depth, richness and rigor – forging links between topics within a subject and between subjects across the curriculum.
- Science is a compulsory subject for all students, therefore all students follow a 5 year pathway. Consisting of a two year Key Stage 3 and a three year Key Stage 4.
- Our three year Key Stage 4 allows the Science team to cover content with sufficient depth, richness and rigour – forging links between topics within a subject and between subjects across the curriculum. For example, mathematical skills are a key aspect of the reformed GCSE specification and so we embed this rigorously from Year 9. We work with the Maths team to ensure that we teach the same technique when analysing graphs or completing specific calculations.
- Our KS4 curriculum aims to inspire future engineers, doctors, researchers, pharmacists, dentists, bio-medical scientists and more.
- We aim to promote a love of learning and proudly advocate for our students to aspire to achieve a Grade 9.
- We are proud and relentless in our high aspirations. We understand that studying Medicine at university requires a suite of Grade 9s and so we aspire for our students to achieve that.
- We aim to devise independent learning skills so our pupils can adequately and sufficiently prepare for the world of work.
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Curriculum- Depth, Breadth and Challenge

Curriculum Design – Breadth and Depth	Curriculum Challenge	Assessment
• Our pupils are taught that science is about working objectively, modifying explanations to take account of new evidence and ideas and subjecting results to peer review. Pupils decide on the appropriate type of scientific enquiry to undertake to answer their own questions and	• We ask questions of pupils with regard to extending their knowledge, making connections, applying new learning (subject specific examples).	• Assessments are driven by the curriculum, not the other way around. We deliver a rich, deep and ambitious knowledge-based curriculum. The assessments evaluate how well we are able to deliver this curriculum and how effectively

develop a deeper understanding of factors to be taken into account when collecting, recording and processing data. They are able to evaluate their results and identify further questions arising from them. • 'Working scientifically' is taught throughout the curriculum and clearly related to substantive science content in the programme of study. Teachers freely choose examples that serve a variety of purposes, from showing how scientific ideas have developed historically to reflecting modern developments in science. • Pupils are encouraged to develop their use of scientific vocabulary, including the use of scientific nomenclature and units and mathematical representations.	• Pupils are required to write and speak in extended ways to explain their thinking. We aim to make children 'explain' rather than just 'describe' • Pupils are taught to think critically about the 'big questions' related to their subject, including those which are relevant to current affairs. • High level of challenge for the most able: planning for them builds to grade 9 criteria (for GCSE); furthermore they are introduced via university taster days / seminars / contact with professionals from key industries to regard the subject in terms of post-16 study and career opportunities. • Participation in local/national competitions/ challenges/ experiential learning related to the subject.	individual pupils have mastered that body of learning. • Assessments are not conducted in isolation. They take place after a particular body of knowledge has been taught or proficiency in a skill has been practised. At the end of each topic, pupils' complete assessment tasks based on the learning taken place during the topic. Pupils are encouraged to revisit materials to ensure concepts and ideas are embedded and so to avoid misconceptions. • The purpose of assessment is to identify the strengths – and any deficits- in an individual pupil's own learning, and to establish whether there are any misconceptions amongst groups of pupils that may need to be retaught, taught differently or otherwise reinforced. • The written assessment point and MCQs assess pupils retention of knowledge and skills. The data collected from MCQs allows for quick review of knowing what pupils have been taught. • Key components are assessed for accuracy and retaught as appropriate the next lesson. Each pupil is given personalised feedback though question level analysis. Pupils who require more time receive additional re-teach sessions after school and given extra focus and support in class.

Cultural Capital

- Girls in tech opens up our pupils' minds to a whole range of different career options in a mainly male dominated field, helping to break gender barriers.
- Regular practical investigations – we believe that these play a vital role in making pupils more inquisitive, improves their questioning ability not just within the science classroom but out of school too. It makes them more wary of the consequences of their choices. For example, being able to identify controls within an experiment and how they affect the results can help develop their ability to identify good and bad choices within their lives.
- The study of a range of scientists who contributed to a whole range of fundamental principles in the science world, but ultimately to humanity enable pupils to truly appreciate the work of others, irrespective of their origin and nationality.
- British Science week – Pupils are encouraged to use curiosity to take part in STEM challenges and raise their aspirations by communications with scientists in different fields.
- Race for the line – All year 7 pupils will take part in the raise for the line challenge encouraging group work allowing our pupils to enter a national competition.

Promoting Equality and Opportunity

SEND and Provision for Disadvantaged	Literacy
• Class Profile Sheets used to completed intervention • Data analysis includes vulnerable groups • Regular data analysis • Scaffolding and differentiation of lesson resources • Curriculum design ensures accessibility.	• Literacy embedded into marking policy • Word bank for department (Key words available for all lessons) • Displays for learning • Comprehension tasks • Extended response
SMSC and British Values	**Leadership and Enrichment**
• Relationships are crucial to teaching and learning: modelling of respect in lessons (how we speak and listen). • Learning about different beliefs and values. For example, with evolution, we teach students that there are different views but all views must be respected. • In Science, we explore organ transplantation and we consider the ethics and cultural and religious perspectives. • We teach about global topics including climate change. • We teach students about healthy lifestyles including nutrition. We also teach about health relationships including family planning.	• Opportunities in lessons for pupils to take defined leadership roles when engaged in group work; make presentations to peers; take responsibility for researching aspects of a topic; create resources and contribute to displays. • Opportunities beyond the classroom to lead throughout enrichment activities. • Opportunities beyond lessons to become a subject ambassador; provide support during Academy open evenings and other opportunities through the academic year.

Science Department Curriculum Implementation

Rationale

Curriculum Delivery	Assessments	Quality Assurance
• Middle leaders ensure that teachers have access to, and fully understand, schemes of work. • Lesson plans are shared and adapted within the department so that there is consistency of curriculum content. • Knowing the profile of expertise and experience among team members is essential. Leaders talk to staff, encourage them to reflect and identify development needs for themselves. Classroom observations are focused and purposeful. Key staff model strategies, standards and expectations for team members. There is a supportive culture in which feedback is sought, discussed, valued and acted upon. • The department has links to subject experts such as examiners and national associations where appropriate e.g. STEM learning. Staff are encouraged to follow developments in the subject. • There is effective induction for new staff and temporary staff: they are well-briefed on policies, including behaviour management, and this enables learning to proceed smoothly. • Know what content has been covered in the Key Stage 2 curriculum.	• The aim of assessment for the Science department is simple. We want to identify gaps, bridge gaps and then check to see whether the gap in learning has been closed. • Assessments take place systematically at the end of each unit and pupils are provided with personalised feedback 'Green sheet' this contains areas of strength and areas of improvement in addition pupils are given feedback on literacy. • All assessment tasks are designed with clear success criteria: consequently, teachers can readily determine whether individual pupils or groups of pupils have misconceptions or require further practice to develop their skills. • Response to assessment may be in different ways, but always with the aim of developing pupils' skills, knowledge or understanding further. Responses to assessment might include: additional challenge questions for individuals; re-teaching an aspect of work in a different way; revisiting a pupil's personal support plan; setting a follow-up task that requires independent research; requiring pupils to complete a 'gap' task that is based on personalised feedback. • If endemic misconceptions occur, departmental planning may need to be reviewed.	• Monitor implementation through internal quality assurance – book looks. • Discussions with pupils – does their understanding match our intention? • Question level analysis (on occasions when formal assessments are undertaken). • Quality assurance assessments are taken at regular points 3 times a year. At KS4 these focus on GCSE examinations at KS3 these are a mixture of recall questions and scaffolded extended response. Some data inputs may be based on teacher assessments.

Curriculum Breadth

Cross Curricular Links	Embedding Challenge into the Curriculum	Implementing Wider Reading and Embedding Literacy
• Teachers have a shared, clear understanding of schemes of work and how they inter-relate. They know the concepts that pupils have already been taught. They consider connections at the point of planning and use these to re-emphasise key learning and affect long-term memory. • Classroom display is used effectively: key vocabulary is prominently displayed, revisited and used for discussion: this emphasises key learning. • Teachers use open-ended questioning that encourages pupils to make connections for themselves. • Teacher use cold call in questioning to ensure all pupils are able to articulate key learning points. • Skills are taught in a coherent way (such as drawing graphs in mathematics and science). • SMSC is audited across the curriculum and values are consistently emphasised.	• Pupils are directly taught about provenance, reliability and bias. • Pupils undertake activities that require them to develop opinions, categorise information in terms of its importance and identify gaps. • Pupils work is regularly reviewed under a visualiser increasing accountability.	• Adults in Academy role model reading for pleasure and for reference/research – show excitement in exploring the subject! • Delight in using extended vocabulary – display, recite and reward. Encourage pupils to develop glossaries. • Classroom displays with literacy focus. • Extended response activities with focus on independence.

Promoting Equality and Opportunity		
Staff Collaboration	**Intervention and Addressing Knowledge Gaps**	**Equal Opportunities and Provision for SEND**
• The Science department uses department time to explore the curriculum and ensure that there is consistency, quality and relevance (recent news stories, new research) to the curriculum delivered. • We engineer opportunities for teachers to work together on defined tasks such as developing new schemes of work, revision resource, displays that will contribute to the curriculum of the department. • We find opportunities for teachers to observe each other's practice in a mutually supportive environment. Some staff are participating in a coaching programme to develop their practice. • We make use of IT solutions for sharing, annotating and storing planning so that all staff can access, amend and refine for their lessons.	• The Science team sequences knowledge through retrieval practice including the use of 'Do it now' activities for memory recall and building in practical skills throughout the year. • Assessments are driven by the curriculum, not the other way around. We deliver a rich, deep and ambitious knowledge-based curriculum. The assessments evaluate how well we are able to deliver this curriculum and how effectively individual pupils have mastered that body of learning. • The curriculum model emphasises breadth and richness. We provide pupils with memorable opportunities to enjoy learning. • Testing is only a means of assessing pupils' learning: it is not an end in itself. Pupils become familiar with assessment criteria so that their learning is purposeful but first and foremost they grapple with subject content and key ideas. • Speedy turn round of assessment data: establish and adhere to set deadlines. • Question level analysis underpinning rapid analysis of issues to be resolved at cohort/class/group/individual level. • Training for middle leaders on analysing data. • AfL in the classroom informs lesson planning and weekly intervention. • Feedback from assessments provides learners with smart targets for improvement.	• By sharing resources and co-planning, we ensure all students have access to high level quality resources that are differentiated to suit the needs of the most and the least able. As a Science, team, we aim to ensure that irrespective of their ability, pupils are taught by enthusiastic teachers, using excellent curriculum plans. • As a Science team, we ensure that for pupils with SEND, steps are taken (advised by specialists in Academy) to remove barriers. When we analyse departmental data, we always look at the SEND performance of our department. • We regularly discuss our vulnerable groups in Science including disadvantaged and SEND. All teacher use their pupil passports to put in place interventions to address the needs of all of their students. • Homework is adapted and accessible to all pupils with feedback available to support areas of need.
Reducing Workload		
• We map out our assessment so we are testing throughout the year but at different time to ensure marking of assessment is manageable. • Marking pro-formas and templates are used to simplify marking and reduce the need for excessive written comments. • Lessons and resources are shared amongst staff to simplify and reduce time taken for lesson planning. • Online homework platform invested in to maximise homework completed with self-marking element. • Homework is set centrally and focuses on knowledge retrieval which is assessed by multiple choice quizzes. • Common schemes of work are a further way in which workload issues are being addressed. • CPD sessions provide opportunities to share best practice.		

Science Department Curriculum Impact

The impact of the Science curriculum is increasingly evident in the way pupils develop scientific fluency, resilience, and curiosity, alongside improved outcomes, particularly for targeted cohorts. Through a curriculum rooted in the **Best Evidence Science Teaching (BEST)** model and aligned with the school's values ("We Care, We Challenge, We Commit"), pupils are gaining a deeper understanding of the 'Big Ideas' in science and their relevance to the modern world.

Pupil Progress and Attainment:
Pupils' ability to recall, apply, and explain scientific knowledge is improving, evidenced by positive trends in key performance indicators across multiple year groups. Robust assessment systems—comprising multiple-choice diagnostics, extended written responses, and question-level analysis—have supported a cycle of responsive teaching, enabling staff to reteach misconceptions rapidly and close knowledge gaps. Notably, the implementation of structured retrieval practice and spaced learning schedules has led to measurable improvements in long-term knowledge retention across KS3 and KS4.

Addressing Disadvantage and Inclusion:
The department has implemented focused strategies to support SEND and disadvantaged learners, including differentiated planning, scaffolded practicals, and

personalised intervention following assessment. Pupil passports are consistently used to inform planning, and the impact is evident in narrowing attainment gaps and increased engagement during lessons. Access to high-quality, centrally shared resources ensures equity and consistency across all teaching groups.

Curriculum Breadth, Literacy, and Cultural Capital:
Through participation in STEM competitions, national campaigns (e.g. British Science Week), and curriculum-linked enrichment (e.g. Girls in Tech, Race for the Line), pupils experience a science curriculum that extends well beyond the classroom. The explicit teaching of Tier 3 vocabulary, command words, and extended scientific writing supports literacy development and enables pupils to articulate complex scientific ideas with increasing confidence. These opportunities foster aspiration, resilience, and a clear understanding of science's role in society.

Destinations and Aspirations:
The Science curriculum provides a strong foundation for future study and careers, particularly in medicine, engineering, and environmental sciences. This is reflected in the growing number of students opting for separate sciences and pursuing post-16 STEM pathways. Pupils are explicitly taught how science connects to real-world challenges such as sustainability, ethics, and global health, which encourages thoughtful citizenship and academic ambition.

Monitoring and Quality Assurance:
The impact of the curriculum is systematically evaluated through internal quality assurance (learning walks, book looks, pupil voice) and external SIP reviews. There is strong alignment between intent, implementation, and outcomes. Leaders use data rigorously to inform planning, and the department has built a culture of reflection, collaboration, and continuous improvement. Teaching routines such as Cold Call, Do It Now tasks, and live modelling are increasingly embedded, supporting a high level of consistency and challenge.

Summary:
Science provision is strong and improving. Pupils are becoming more confident, articulate, and curious scientists. The department's work is underpinned by research-informed practice, and the focus on equity, curriculum depth, and disciplinary literacy ensures that all learners—regardless of starting point—have the opportunity to succeed and thrive in science.