Wymondham College Science Department

Curriculum Intent:
We want our students to understand the importance of the sciences and the impact that they have had on their lives, through delivery of a rigorous and well-balanced curriculum, which has been sequenced to allow students to progress through their understanding in a manner that allows them to review their understanding regularly and to build on it in a way that allows them access to a greater understanding than experienced by most students their age.

The curriculum spans the three different disciplines of the Sciences and moves students to move seamlessly from Key Stage 2 Science through to GCSE or to A Level and beyond, should students choose this path. We aim to provide students with a grounding in understanding the world around them that goes beyond that which most students would experience through delivery of Triple Science to all of our students, delivered by well-qualified specialist teachers, supported by knowledgeable technician support. Students are also given access to Science beyond the classroom, through engagement with invited speakers, trips out and the super-curricular activities offered.

Whilst the Sciences are all taught separately at GCSE by only specialist teachers, there is a collaboration between the departments to allow students a commonality of approach and language, to allow a consistent student experience. Students will leave us, therefore, knowing that they have had access to a Science curriculum that goes beyond that which would be experienced by most.

How the curriculum fits in to the College's FABRIC?
Focused The broad outline sequence of the Y7-Y13 curriculum was developed over a six-year period and continues to be refined. The individual subject departments worked together to develop the sequence, based on feedback from those that were teaching the individual elements and the response from the students. Once the sequence had been decided we were able to put support materials in place, to aid student progress. These all allow students to review their learning and for teachers to react to strengths and to see where students need support in the short-term and on longer time frames.

The materials developed are:

- STIR Slides – review learning on a lesson-by-lesson bases
- Support Sheets (listing key terms and concepts for each topic)
- Prep booklets – allowing more formal, but low-stakes review
- Summative Tests
- Literacy activities, developed by our teaching staff.
- Carousel homework activities, allowing regular retrieval of prior learning.
- Key core practicals (In-house in Y7-Y8. Required practicals in Y9 upwards)

Both disciplinary and substantive knowledge have been mapped across the year groups. The Science department worked with the Maths department to map key mathematical disciplinary knowledge across the curriculum, to ensure consistency of terminology and appropriate levels of mathematical challenge as students' progress through the curriculum.

Recent evaluation of the curriculum offer has led to a 'Triple Only' curriculum offer for students. This exposes students to a broader range of science, allowing all students equality of opportunity in terms of the learning that they can receive.

Appropriate

Knowledge and skills are mapped across the curriculum, with key ideas building as they are revisited each year. Before mapping KS3 and KS4 content, both KS2 and A Level documents were consulted to make sure that the level of challenge for all students was adequate and appropriate. Assessment opportunities are built in to the curriculum and reflect the increasing expectation of knowledge and understanding of students as they move through the curriculum. Assessment is via end of topic tests, which are common across all students. Assessments include aspects of previously taught content.

From Y10 upwards, students are selected for a Foundation or Higher Triple Science programme of study. The decision is based on use of different data sets (KS2 score, CAT data, test tracking data). This ensures that all students have access to an appropriate level of study without preventing students from being able to access the broad range of knowledge that we want for them.

Broad and balanced

All students study Triple Science to GCSE. This allows our students to experience the a more full range of knowledge than most others.

The Science curriculum incorporates three subjects, all taught only by specialists from Y10 upwards. This allows students to experience teachers who have a real depth of knowledge and passion for their subjects. The strength of the department at A Level is a consequence of the experience of teaching staff and is augmented through access to super-curricular opportunities, including speakers, workshops and extended projects/practicals.

Through the curriculum and the experiences offered outside of the classroom students are exposed to:

- Some of the history of scientific thinking and how this has developed over time.
- An understanding of the collaborative approach to the practice of science

Technical staff are all specialists, with knowledge of working in industry. This allows the teaching staff access to true technical support. Practicals work and are adapted to meet the needs of the students and teaching staff.

Rigorous

All of the work of the department is aimed at allowing students to build on prior knowledge. The resources developed have this at their core. Retrieval activities (STIR slides, prep booklets, Carousel activities and assessments) allow students time to practice what they have learnt and to receive feedback on it in a number of different ways. These are designed to test students' understanding of both recent and less recent topics. Opportunities are build in to teaching schedules to allow students to reflect on their learning and to take steps to fill any gaps in understanding.

For Y11 students a thirteen-week revision schedule is published each year, in the run up to the Easter holidays. Each teacher uses the resources to review key topics studied across Y9-Y11. Resources are sent to parents/carers and Heads of House to further embed good revision with Y11 students.

Integrated

Learning is mapped from year to year and shared across the department. Topics build on each other, both implicitly and explicitly, which is emphasised by teaching staff through their practice and is supported by the resources developed by the department. Teaching staff work together to provide a curriculum journey that links back to prior learning as students progress and also links to other subjects, both within the department and beyond.

Recently the department has liaised with the Maths department to ensure that maths skills and language are aligned wherever possible. Ongoing professional development within the department ensures that staff are able to share their expertise with each other and share

Coherent

Each topic has a central theme. There are clear Biology/Chemistry/Physics topics, but there are also clear themes within each topic. Schemes of work are shared across the department. Each topic is carefully sequenced to allow the content in it to build on previous topics, whilst allowing students to explore further and wider than the confines of each of the topic. Teaching staff are enthusiastic about teaching their subjects

How we assess learning	**Key Vocabulary**
- STIR Slides, used at the start of each lesson to review learning progression - Prep booklets, used at regular intervals throughout each topic to allow students and teachers to assess learning holisitically - Use of internally produced Carousel activities, aimed at increasing scientific literacy and identification of any gaps in student understanding - End of topic assessments, to allow for more formal, summative assessment	There is a huge range of technical vocabulary. Literacy CPD has embedded the idea of 'there are no synonyms in Science' into the thinking of the department. For this reason, different resources have been developed by the department to allow students to understand key vocabulary for each topic, to practice its use and to use it in context. • Topic Support Sheets have been developed to allow students to review learning as they move through topics and at the end of each topic. • Carousel Learning tasks have been developed to allow students regular practice of key terms and for teaching staff to identify quickly and easily those terms with which students struggle. • Literacy activities have been developed by teaching staff to allow students to see key vocabulary used in context and to understand its appropriate use.

Enrichment	Careers Education prepares our students to make informed choices about their futures
- Guest speakers invited in (in-person or online) - Dr Karl Q&A session - Peel Lecture every year - Students taken to Inaugural Lectures (when available) at UEA - Trips out to e.g. New Scientist Live - Involvement with Biology, Chemistry and Physics Olympiads - Involvement with Salters Festival of Chemistry - Students taken to Women of the Future conference - Students encouraged to apply to John Innes Centre Summer Camp - Relevant MOOCs shared with students - Attendance at JIC RSSV Accessible Science talks - Amgen Biotech Experience - Barcoding the Broads - Involvement with JIC RSSV lectures	- Guest speakers invited in (in-person or online) - Peel Lecture every year - Students taken to Inaugural Lectures (when available) at UEA - Trips out to e.g. New Scientist Live - Students taken to Women of the Future conference - Students encouraged to apply to John Innes Centre Summer Camp - Relevant MOOCs shared with students - Attendance at JIC RSSV Accessible Science talks -

Our curriculum is underpinned by our values and are expressed through our curriculum

Pride

Staff take real pride in delivery of a curriculum that they have developed and refined over time. They have high expectations of the students in their classes and students respond well to this.

Passion

All teaching staff are trained specialist science teachers, who have a passion in sharing their knowledge and understanding with the students they teaching. In Y10 and beyond, classes are taught by specialists only, which allows students to engage with teachers in a more meaningful way and explore the passion that those teaching staff bring to their lessons, through the knowledge and enthusiasm they have for their subject. The depth of knowledge at A Level within the department allows teachers to further share their love of their subjects. The breadth of experiences beyond the

classroom available allows students to explore their passions for the sciences in a deeper and more meaningful way, one which allows their understanding to blossom further.

Positivity
Students and teachers work together to achieve. There is a mutual respect for each other with learning at the heart of what we do. All students are encouraged to achieve everything that they can through a curriculum that aims to allow them to ask meaningful questions of the world around them.