Subject Area: Applied Science

Curriculum Intent: To instil enthusiasm for science and to develop an interest in further study and careers associated with the subject, in the fields of medicine, engineering, environmental or other science related subjects. Through our courses we aim to equip our students with a detailed body of knowledge as well as help them build the skills required to make progress and achieve success in the scientific enterprise. A key aim is to make our students more powerful abstract, logical thinkers. Within the study of each our science courses, we enable students to develop and demonstrate a deep subject knowledge, an understanding of scientific methods, as well as develop competence and confidence in a variety of practical, mathematical, research, analytical and problem-solving skills. We also aim to extend the cultural capital of our students by increasing their scientific literacy and engagement in discussion and critical evaluation of science in the media. We aim to equip them with an understanding of the interplay between science, technology and society, the role that scientists have had in creating problems and mitigating impacts, as well as how the sciences contribute to the success of the economy and society. Complementary to this, sits our commitment to embed both the academy's professional standards and sense of civic virtue: our aim is for students to understand varying viewpoints of the scientific enterprise as well as consider the consequences and integrity of decisions and actions that they take as scientists, as individuals, and as a community, on the environment, on themselves and on others.

Dates	Content	Assessment	Rationale
Term 1	**<u>Unit 1:</u>** **Topic B:Biology** B1: Cell structure and function B2: Specialised cells B3: Tissue structure & Function **Topic A:Chemistry** A1: Structure & Bonding	**PC1:** Covers B1, B2 and part of B3 **PS/CVs** students learn the science behind neurological diseases and evaluate forms of treatment. Students learn how to discuss sensitive and ethical issues on a local scale –e.g. linked to friends and family and on a national scale, e.g. access to different treatments within the NHS.	Unit 1 is an externally assessed unit that builds on previous knowledge from KS4 and helps lay the foundation for work covered in later units. By delivering it in term 1 and 2 the exam can then be sat in the January of Term 3 allowing for resits in June if necessary. Also, the students learn key scientific principles which can then be applied to subsequent units. Some of the content in Unit 1 is also covered at the same time in A level Biology and Chemistry, e.g. cells, and structure and bonding. Some students take applied science alongside these A levels and covering them in both subjects reinforces their learning. Also, the overalp of content provides flexibility within the curriculum model as it allows for students to change courses within the first month where necessary.
Term 2	**Topic A:Chemistry** A2: Production and uses of substances in relation to properties **Topic C: Physics** C1: Working with Waves C2: Waves in communication	**PC2:** Covers B3, A1 and A2	
Term 3	**<u>Unit 2:</u>** This is a practical unit where students are introduced to standard lab equipment and following teacher led demos have to independently carry out the practical tasks and then write a written report in response to a provided assignment brief. The assignments cover the following areas and are spread across the remaining terms of year 12 **A** Undertake titration and colorimetry to determine the concentration of solutions	**External Assessment:** Examiniation on unit 1 **Internal Assessment:** Assignments set for each Learning Aim with specified deadlines. Marked by teacher and a sample sent to external Standards Verifier (SV). **CEIAG:** This practical unit teaches students skills and methods that can be used in future scientific careers. Students develop their interpersonal skills e.g. teamwork, where they have to work together to produce accurate data sets. Also self -reflection on the development of their laboratory skills	The practical activities use background knowledge acquired from Unit 1. Titrations require students to learn how to work accurately and handle equipment safely. These skills can be used for the remaining practical tasks. Students are taught how to evaluate the practical in terms of reproducibility and validity of results. These skills are then used for the subsequent practical activities (B and C). On completion of this unit students will have acquired a variety of practical skills that are useful in industry. They will also have developed their literacy and maths skills so that they are competent in writing scientific reports. The wide range of practical activities will increase their ability to recognise problems and solve them independently. These practical skills are then used for independent research in Unit 3. Students who are studying additional science subjects can apply their skills and knowledge from Unit 2 to similar required practicals in Biology, Chemistry or Physics A levels. If students decide that post-16 studies are not for them, then they can obtain a BTEC certificate if they complete Unit 1 and Unit 2.
Term 4	**<u>Unit 2:</u>** **B** Undertake calorimetry to study cooling curves **C** Undertake chromatographic techniques to identify components in mixtures		
Term 5	**<u>Unit 2:</u>** **D** Review personal development of scientific skills for laboratory work		
Term 6	**<u>Unit 3:</u>** Learning Aim F – Plants & their environment	Whilst learning about plants and their environment, students discuss the impact of changing climate conditions on arable crops both on a local scale (flooding in Calderdale) and globally.	Learning Aim F of Unit 3 is carried out in the summer term. This ensures that there is sufficient plant material to sample.

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Term 1	**Unit 3: Science Investigation skills** Learning aim A – Planning a Scientific Investigation Learning Aim B – Data collection & Analysis Learning aim C – Conclusions & evaluation Learning Aim D – Enzymes Learning Aim E – Diffusion of molecules	**PC1** – covers content, HSW and numeracy skills from learning Aims A, B, C, D and F	This unit is a combination of a practical investigation and an externally assessed exam. Students are taught the necessary skills for planning an investigation, collecting relevant data and drawing the correct conclusions from their results. (Learning aim, A, B, C). They apply this knowledge to a series of practical investigations that cover, biology, physics and chemistry topics (learning Aims D-H) The assessed practical investigation and external assessment will be on one of these topics. This Unit is started at the end of year 12 so that it can be completed prior to the external assessment in the January of year 13. Learning Aim D is carried out in term 1 as the concepts are fundamental and can be applied to some of the other Learning Aims studied in Year 13.
Term 2	Learning aim A – Planning a Scientific Investigation Learning Aim B – Data collection & Analysis Learning aim C – Conclusions & evaluation Learning Aim G – Energy content of fuels Learning Aim H – Electrical Circuits	**PC2** – trial exam. Students carry out an investigation and complete the associated written exam in preparation for the external assessment in January.	
Term 3	**Unit 12: Diseases & Infections** (chosen optional unit) Learning aim A – Pathogens and Infectious diseases Learning Aim B – Transmission & prevention	**External Assessment:** Examiniation on unit 3 **Internal Assessment:** Assignments set for each Learning Aim with specified deadlines. Marked by teacher and a sample sent to external Standards Verifier (SV).	This unit aims to develop understanding of how different types of diseases and infections develop and spread, and what makes some of them fatal. Learners will investigate how these diseases and infections have an impact on people, society and the environment and how they can be treated and cured. Many Applied science students go onto study medical based subjects, e.g. biomedical science, midwifery, nursing and the knowledge from this unit is very beneficial. The Learning Aims are taught so that students gain knowledge about the range of pathogens and how disease is spread, before looking into more detail about how the human body protects itself against disease and how various treatments work to prevent and cure disease. Students who also study A level biology will also study Immunity and vaccinations so this will reinforce their learning.
Term 4	Learning Aim C - Immunity & vaccinations Learning Aim D – Human Body Responses	Students discuss the impact of the spread of infection locally (e.g.within their school) and globally. Students are made to think about the ethics of containment of disease (e.g. should people be prevented from travel during an outbreak) and debate this empathetically. Ease of access to treatment both nationally and globally is studied giving students an insight into the differences in economies between developing and developed nations.	
Term 5	Revision Unit 1 and 3 Revision for Unit 1 and Unit 3 for students who have not achieved a pass or their target grade		Students have to pass each Unit to pass the course. Students may need to retake either or both Unit 1 and 3 to achieve this or to improve their grade.
Term 6	Padlet work		To help malke links to higher education, apprenticeships and/or employment