Holy Trinity School

A Church of England Secondary School

Science Curriculum Guide

WHOLE SCHOOL CURRICULUM INTENT STATEMENT

Curriculum Intent:

- As a Church of England School, we are committed to the belief that every child is a child of God – uniquely blessed with individual gifts and talents. The intention of our curriculum is to provide opportunities for all students to flourish, drawing out their individual potential and developing them as fully integrated human beings. Our curriculum reflects our Christian ethos and is designed to be challenging, fulfilling, enjoyable and successful for all, regardless of academic or social barriers.

- The curriculum is designed with the intention of being rich and balanced, giving a breadth of opportunity at Key Stage 3 supporting the development of the skills needed to succeed at Key Stage 4 and Key Stage 5. Key Stage 4 has a core which includes RS GCSE for all, alongside both academic and vocational courses. Key Stage 5 provides appropriate pathways for the majority of students to progress to and allows students to prepare for further study and the world of work. Alongside this, students are provided with a broad enrichment and work-related offer that stimulates their aspirations as global citizens - resilient in the face of difficulty, skillful when faced with new challenges, confident to step out into the unknown and assured of their individual self- worth and of the unique gifts that they each have to bring to the world.

We review our curriculum on a yearly basis and consider the following principles. We believe our curriculum should:

- Embody the school vision which is to be a centre of excellence for learning, inspired by Christian values, where every person in our school community fulfils their potential.

- Provide a broad and balanced range of subjects, including those that are creative and practical, at all Key Stages.

- Include opportunities in a range of both academic and vocational courses at Key Stages 4&5.

- Ensure Religious Studies sits alongside Maths, English and Science as a Core subject which every student will take up to GCSE level.

- Ensure that every student has the opportunity to develop their character through a variety of experiences within REACH, PE, and the Creative Arts.

- Be coherent and sequential so that new knowledge and skill builds on what has been taught, both within an individual subject and across the wider curriculum.

- Be informed by educational research e.g. Growth Mindset (Carol Dweck) and Feedback Loop (John Hattie).

- Acknowledge our contextual needs by giving a high priority to increasing students' mastery of functional literacy, vocabulary and numeracy to maximise students' opportunities for future learning and employment.

- Provide opportunities for learning outside of the classroom. At KS3 this is being embedded through the concept of a 'Passport'; a collection of co-curricular experiences that every student will have experienced.

- Make explicit links to future career pathways alongside a

programme of advice and guidance based on the Gatsby benchmarks to prepare students for life and work. Ensure effective transitions at all key
stages; from Year 6 to Year 7, Year 9 to Year 10 and Year 11 to Year 12.

- Meet statutory National Curriculum expectations.

Whole School Curriculum Principles:

- Our curriculum is structured in a logical and chronological manner.

- Leaders carefully plan to ensure that appropriate knowledge and skills build upon what has been taught previously and are
carefully developed before application into more challenging and complex situations, appropriate to the different curricular end points. These skills are recognised as the 'big ideas' within each subject area.

- Knowledge is considered as a 'big idea' within all subject areas. We are developing our understanding of cognitive psychology to enable students to maximise their learning potential. This is best seen through the regular opportunities provided within subject areas to revisit knowledge acquired to enable improved retention and recall.

- Our curriculum runs within a two-week timetable made up of 50 periods a fortnight, with 5 x 1-hour lessons plus assembly and Tutor time every day.

- Each day begins at 8.45am with registrations, assemblies and a period of reflection and students are dismissed from this regular timetable at 3.10pm.

- There are a range of additional activities such as study studio and numerous co-curricular opportunities which take place after this time on a daily basis.

Whole School Learning Principles:

- Progress at Holy Trinity is informed by 'Accelerated Learning' which emphasises efficiency by engaging learners in order to speed up the process of learning. It enables students to commit knowledge to their long-term memory and develop and refine their skills and performance over time.

- This in turn supports the OFSTED definition of learning; "Learning is defined as an alteration in long-term memory. If nothing has altered in long-term memory nothing has been learned".

Subject Intent Statement:

- The science curriculum has been designed to provide students with a deep understanding of the scientific knowledge and ideas that impact them as individuals within a local and globalised context. As they move through the curriculum, students will be increasingly made to develop their curiosity, provide insight into working scientifically and appreciate the value of science in their everyday lives. Our curriculum provides a platform for more advanced science-based study, providing a gateway into a wide range of career opportunities. It also delivers a framework for understanding the natural world and supporting students to become scientifically literate participants in society
- The Holy Trinity C of E School Science department is committed in ensuring all our community make better than expected progress across all Key Stages in the subject of science.
- In science we deliver a 5 year curriculum that aims to build from students understanding of key scientific principles from Key Stage 2 into the Big Ideas of Science that will enable them to enter a pathway for continued study at A Level, Vocational Study or the world of work.
- Students are required to recall basic facts and ideas, apply these to known and unknown situations. Students may also be presented with data to plot or solve mathematical problems using equations. Students will apply their practical skills through working scientifically. Key subject vocabulary is developed during the Key Stages to help with literacy in science.
- The spiral nature of our curriculum allows for regular opportunities to review and revisit both content and skills to help to develop "deep" long-term leaning. Review and regular reflections in lesson allow for misconception to be addressed in a timely manner. After assessments via PIA the action's those students complete are designed to address specific content or skills.

- Through our local links and our Cultural Capital days/ events the science department provides opportunities for the students to experience Science beyond the classroom.

- Careers awareness is developed through learning and development of following skills and through a range of STEM and University links. Science covers a wide area of topics that link with the local companies from Gatwick and Manor Royal. Physics and Electronics students have found work on both sites. Although the specification doesn't make any direct reference to careers, all aspects of Chemical process, such as fermentation link to baking, oil and petrochemicals and brewing. Biology links to health and medical and well as developments in food science, Physics links to forces and electricity have those local links to aviation and engineering subject and careers.
- At Key Stage 3 our Science Club is intended to deepen our students understanding and appreciation whist also extending further opportunities to them, e.g., Crest Awards. We have established links with Thales for the provision of STEM activities and enrichment for our KS3 students.
- The Science department offers a BTEC Level 3 in the 6th form as a more suited pathway for some of our learners. In September 2021 we introduced a Level 2 provision of GCSE Biology as part of a foundation year for our 6th form.
- We offer GCSE Combined Science and the three Separate Sciences (Triple Science) to the most able in year 10 and 11.
- Our Science Curriculum gives all students an exciting opportunity to discover, discuss and debate the compatibility of science and faith. Our shared Corridor with the RPE department signifies that connection both physical and
  spiritual which aims to equip young people with the all- important tools they need to form their own opinions and engage in rational, exciting, well-reasoned and thought-
  provoking discussion about the place for science in God's world.

Curriculum Aim:

- Albert Einstein said “The more I study Science the more I believe in God”
    - The Holy Trinity C of E School Science Department is committed to providing a high-quality science education, setting the foundations for understanding the world through the specific disciplines of Biology, Chemistry and Physics. Science has changed our lives and is vital to the world’s future

prosperity. Through building up a body of key foundational knowledge and concepts, pupils will be able to recognise the power of rational explanation using evidence and develop a sense of excitement and curiosity about natural phenomena. They will understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

Curriculum Principles:

- The Holy Trinity C of E School Science Department aspires to develop students who are skilled critical thinkers, problem solvers, innovators and team players. We will develop the minds of life-long learners by providing access to a variety of course offerings that will support the creativity and curiosity of all students. At the conclusion of their school career, our students will be capable of applying their scientific knowledge to contemporary issues, making connections between scientific disciplines, and pursuing post-secondary education or careers in the fields of science and engineering. We will empower them to fulfil their duty as citizens and help them feel more confident in the decisions they may need to make about family health and nutrition or environmental concern.

Key Stage 3:

- Years 7 and 8 follow the first two years of our 5 Year Curriculum to give our students the opportunity to form the foundations of the Science curriculum.
- In Year 7 students receive a grounding in Investigative Science and complete units in each of the Sciences which cover a range of subjects and skills. The units are arranged around the big ideas in secondary science, cells, chemical interactions and energy. Throughout the course students will carry out practical work in the context of each section and develop their knowledge and understanding to: pose

scientific questions, define scientific problems, plan and carry out investigative activities. In a range of contexts, students will: collect, select, process, analyse and interpret both primary and secondary data to provide evidence, evaluate their methodology, evidence and data.

- In Year 8 students further develop their knowledge and skills in Science through a cycle of units, which cover a range of subjects and skills. The units build on the foundation of year seven and extend with ideas of bodily processes, the atomic model and fields and forces.
- In Year 9 we have developed a bespoke curriculum aimed at acting as a bridge between the foundations formed in year 7 and 8, and the demands of the GCSE.

Key Stage 4:

- Year 10 and 11 then follow the AQA Combined or Separate Science Curriculum:
- All students follow either the AQA GCSE Trilogy Combined Science specification or the Separate Sciences (Biology, Chemistry, Physics). The pathway students follow depends on attainment during years 7 and 8, the final exam sat is discussed with students, parents and staff ahead of the exams at the end of year 11.
- All students in 10 & 11 will develop their knowledge and skills from Year's 7, 8 & 9 and will consolidate their skills in planning and evaluating investigations. The GCSE Science programme of study is presented in four sections: Biology, Chemistry, Physics and Required Practical. The required practical content is integrated through the context of the subject content. Each term will focus on segments of the biology, chemistry and physics component of the course alongside the relevant required practical activities. Students will be prepared for their terminal examinations which are all held in the Summer of Year 11.
- All examinations will include structured and closed questions and at least one extended response question. Throughout the course students will carry out practical work in the context of each section and develop their knowledge and understanding to: pose scientific questions, define scientific problems, plan and carry out investigative activities. In a range of

contexts, students will: collect, select, process, analyse and interpret both primary and secondary data to provide evidence, evaluate their methodology and data.

Combined Science (AQA Trilogy):

- This course keeps the learning varied meaning that students remain engaged and stimulated by the different topics. The course also makes clear links between the three Sciences so students can fully appreciate the connections between topics and in real life situations. We will often use theory from one Science to help us understand another concept e.g. the chemical reactions that take place in living organisms.
- The course develops scientific literacy and a range of skills that will enable students to understand and evaluate scientific concepts encountered in everyday life and other contexts.
- Practical science remains at the heart of our Science teaching and form an important part of the course. Apart from the usual experiments in lessons, students will complete 21 compulsory practical work and investigations over the three years. These practical activities will then be assessed during the final external exams.
- Students are externally assessed at the end of Year 11. They sit 6 papers, each worth 16.67% of the overall grade in either the Foundation or Higher tier. Each test is a 1 hour 15-minute written paper and is made up of multiple choice, structured, closed, short answer and open response questions.

<u>Separate Sciences (AQA Biology, Chemistry, Physics):</u>

- This leads to three GCSEs in Biology, Chemistry and Physics and is particularly suitable for those who wish to study Science post-16 as this path covers the breadth and depth necessary for further study.
- In Biology GCSE, students gain a good understanding of Human Biology, organisms, evolution and the environment. The Chemistry GCSE gives the students an opportunity to develop a good understanding of the nature of substances and how they react together, how chemistry is used in business and industry and how our use of fuels affects the local and global environment. The Physics GCSE covers the use and transfer of energy, as well

as an insight into the nature of waves, radiation and space, and how physics is applied in the real world we live in.

- Students are externally assessed at the end of Year 11. They sit 2 papers, each worth 50% of the overall grade in either the Foundation or Higher tier for each of the Sciences i.e. six in total. Each test is a 1 hour 45-minute written paper and is

made up of multiple choice, structured, closed, short answer and open response questions. Students will also complete 24 compulsory practical activities across the 3 subjects during lesson time over the three-year course. Questions on these practical activities will be appear in the exam papers

Key Stage 5:

- At Key Stage 5 The Holy C of E we offer 5 different Science options for our students post 16:

AQA A level Biology

AQA A level

Chemistry AQA A

level Physics

WJEC/ EDUQAS A level Electronics

BTEC Level 3 Applied Science:

The entry criteria for these courses is as follows

- A level Biology: 66 in Science and a 5 in Maths
- A level Chemistry: 66 in Science and a 5 in maths
- A level Physics: 66 in Science and a 6 in maths and a 5 in English
- A level Electronics: 55 in Science 5 in maths and 5 in English
- BTEC Level 3 Applied Science: 5 in Science 4 in maths and a 4 in English

<u>A level Biology Overview</u>

The AQA A-Level Biology specification encourages you to nurture your passion for biology and develop the transferable skills you will need for further study or a scientific career as you:

- Gain the skills to make connections and associations with all living things around you.
- Deepen your understanding and gain essential

knowledge of different aspects of the subject and how they relate to each other.
- Communicate your ideas and discoveries in appropriate ways using technical terminology.

- Use a variety of sources to carry out your own research into scientific questions and issues.
- Develop competence and confidence in a variety of practical laboratory techniques.
- Successfully manage risks and hazards.
- Evaluate methodology, evidence and data, and resolve conflicting evidence.
- Practice numerical manipulations and data processing to analyse results and solve problems.
- Consider applications and implications of science and evaluate their associated benefits and risks including ethical issues in the treatment of humans, other organisms and the environment.

A level Chemistry Overview

The AQA A-Level Chemistry specification encourages you to nurture your passion for chemistry and develop the transferable skills you will need for further study or a scientific career as you:

- Deepen your understanding and gain essential knowledge of different areas of the subject and how they relate to each other.
- Develop competence and confidence in a variety of practical laboratory techniques.
- Practice numerical manipulations and data processing to analyse results and solve problems.
- Use theories, models and ideas to develop scientific explanations.
- Communicate your ideas and discoveries in appropriate ways using technical terminology.
- Use a variety of sources to carry out your own research into scientific questions and issues.
- Successfully manage risks and hazards.
- Evaluate methodology, evidence and data, and resolve conflicting evidence.
- Consider applications and implications of science and evaluate their associated benefits and risks including ethical issues in the treatment of humans, other organisms and the environment.

A level Physics Overview

The AQA A-Level Physics specification encourages you to nurture your passion for physics and to lay the foundations for further study as you:

- develop their interest in and enthusiasm for the subject, including developing an interest in further study and careers associated with the subject
- develop essential knowledge and understanding of different areas of the subject and how they relate to each other
- develop and demonstrate a deep appreciation of the skills, knowledge and understanding of scientific methods
- develop competence and confidence in a variety of practical, mathematical and problem-solving skills
- understand how society makes decisions about scientific issues and how the sciences contribute to the success of the economy and society
- use theories, models and ideas to develop scientific explanations
- use knowledge and understanding to pose scientific questions, define
- scientific problems, present scientific arguments and scientific ideas
- use appropriate methodology, including information and communication technology (ICT), to answer scientific questions and solve scientific problems
- carry out experimental and investigative activities, including appropriate risk management, in a range of contexts
- analyse and interpret data to provide evidence, recognising correlations and causal relationships
- evaluate methodology, evidence and data, and resolve conflicting evidence
- know that scientific knowledge and understanding develops over time
- communicate information and ideas in appropriate ways using appropriate terminology
- consider applications and implications of science and evaluate their associated benefits and risks
- consider ethical issues in the treatment of humans, other organisms and the environment

- evaluate the role of the scientific community in validating new knowledge and ensuring integrity

- evaluate the ways in which society uses science to inform decision making

A level Electronics Overview Aims of the course

- A level in Electronics will ensure that learners have the electronic and mathematical knowledge and electronic engineering skills to solve problems. This should enable learners to appreciate how many problems in society can be tackled by the application of the scientific ideas in the field of electronics using engineering processes. The scope and nature of the learner's study will be coherent and practical. The practical work enables learners to see the theoretical knowledge contained in the specification in action and to gain greater understanding of the knowledge in a practical context. This is an excellent a well-established subject that offers excellent future pathways for our 6th form students.

Studying WJEC Eduqas A level Electronics enables learners to:

- Develop essential scientific knowledge and conceptual understanding of the behaviour of electrical/electronic circuits
- Develop and demonstrate a deep understanding of the nature, processes and methods of electronics as an engineering discipline
- Develop competence and confidence in a variety of practical, mathematical and problem-solving skills
- Develop and learn how to apply observational, practical and problem-solving skills in the identification of needs in the world around them and the testing of proposed electronic solutions
- Develop and learn how to apply creative and evaluative skills in the development and assessment of electronic systems to solve problems
- Develop their interest in electronics, including developing an interest in further study and careers associated with electronics.

BTEC Level 3 Applied Science Overview

The BTEC National Extended Certificate Applied Science is a course that combines exams with assignment-based work and is suited to independent learners that would benefit from this way of working. There are 3 mandatory units two of which are externally assessed.
The remaining mandatory unit and the optional unit comprise of a series of assignments designed to provide students with the knowledge and techniques required for the applied science sector.

You will develop the transferable skills you will need for further study or a scientific career as you:

- Deepen your understanding and gain essential knowledge of different aspects of the subjects covered.
- Communicate your ideas and discoveries in appropriate ways using technical terminology.
- Use a variety of sources to carry out your own research into scientific questions and issues.
- Develop competence and confidence in a variety of practical laboratory techniques.
- Successfully manage risks and hazards.
- Evaluate methodology, evidence and data, and resolve conflicting evidence.
- Practice numerical manipulations and data processing to analyse results and solve problems.
- Consider applications and implications of science and evaluate their associated benefits and risks including ethical issues in the treatment of humans, other organisms and the environment.

Curriculum Overview for Year 7:

KS3 Year 1: Year 7		
HTS follows the topics in the Oxford University Press (OUP) Activate 1 for Year 7, cross referencing with the KS3 National Curriculum, and the OUP suggested 5-year scheme of work, in preparation for GCSE.		
Key topics	Course content	Assessment
Autumn 1:	Introduction to science at secondary school (7-10 lessons) Focus on: Safety Key scientific vocabulary How Science Works/Working Scientifically skills Carousel of topics from Activate 1 begins. Bi1: Movement and Cells Ch1: Movement and Particles Ph1: Speed, Gravity and Energy	Preparation: End of topic assessment comprised of exam past questions at the end of each unit (45 mins). The grading system provides a flightpath to GCSE. PIA feedback given.
Autumn 2:		
Spring 1:	Carousel of topics from Activate 1 continues. Bi2: Variation and Human Reproduction Ch2: Particle Model and Separating Mixtures Ph2: Voltage, Resistance and Current	Preparation: End of topic assessment comprised of exam past questions at the end of each unit (45 mins). The grading system provides a flightpath to GCSE. PIA feedback given.
Spring 2:		
Summer 1:	Carousel of topics from Activate 1 continues.	Preparation:

Summer 2:	Bi3: Interdependence and Plant Reproduction Ch3: Acids, Alkalis, Metals and Non-metals Ph3: Sound and light	End of topic assessment comprised of exam past questions at the end of each unit (45 mins). The grading system provides a flightpath to GCSE.
		PIA feedback given.

Suggestions for independent study and home support:

GCSE BBC Bitesize, Seneca Learning website for recall questions and content, Kerboodle online versions of the textbook, Youtube revision videos (for example. freesciencelessons, Primrose Kitten), **'homework choice' sheets created in department**

KEY SKILLS

Literacy: -Key terms and definitions -Structured writing tasks	Numeracy per the spec and NC, to include: -Arithmetic and numerical computation -Handling data -Algebra -Graphs -Geometry and trigonometry	Practical assessment: -making and recording measurements accurately -safe and appropriate use of equipment -correct use of apparatus and techniques -application of appropriate techniques -safe and careful handling of chemicals and organisms -observations of the effects of changing factors/variables

Curriculum Overview for Year 8:

KS3 Year 2: Year 8		
In Year 8 we cover the remainder of the KS3 National Curriculum using Activate 2 (Oxford University Press) textbooks.		
Key topics	Course content	Assessment
Autumn 1: Autumn 2:	Carousel of topics from Activate 2 begins. Bio4: Organisms Chem4: Matter Phys4: Forces ChE: Earth Structure and the Universe	End of topic assessment comprised of exam past questions at the end of each unit (45 mins). The grading system provides a flightpath to GCSE. PIA feedback given.
Spring 1: Spring 2:	Carousel of topics from Activate 2 **continues**. Bio5: Ecosystems Chem5: Reactions Phys5: Electromagnets	End of topic assessment comprised of exam past questions at the end of each unit (45 mins). The grading system provides a flightpath to GCSE. PIA feedback given.
Summer 1: Summer 2:	Carousel of topics from Activate 2 **continues**. Bio6: Genes Chem6: Earth: Climate and resources Phys6: Energy	End of topic assessment comprised of exam past questions at the end of each unit (45 mins). The grading system provides a flightpath to GCSE. PIA feedback given.

Suggestions for independent study and home support: **GCSE** BBC Bitesize, Seneca Learning website for recall questions and content, Kerboodle online versions of the textbook, Youtube revision videos (for example. freesciencelessons, Primrose Kitten), **'homework choice' sheets created in department**
KEY SKILLS

Literacy: -Key terms and definitions -Structured writing tasks	Numeracy per the spec and NC, to include: -Arithmetic and numerical computation -Handling data -Algebra -Graphs -Geometry and trigonometry	Practical assessment: -making and recording measurements accurately -safe and appropriate use of equipment -correct use of apparatus and techniques -application of appropriate techniques -safe and careful handling of chemicals and organisms -observations of the effects of changing factors/variables

Curriculum Overview for Year 9:

Exam Board & course	Date of Exam	% of Total Exam
Most students: All students • Combined Science (Trilogy) : 8464	Summer Year 11	100%
Some students: Separate Sciences • Biology : 8461 • Chemistry: 8462 • Physics: 8463	Summer Year 11	100%

Key topics	Course content	Assessment
Autumn 1:	Introduction to GCSE science Focus on: How Science Works/Working Scientifically skills Key scientific vocabulary	Transition test provided by AQA
Autumn 2: Spring 1: Spring 2: Summer 1: Summer 2:	Carousel of topics from paper 1 begins. By the end of year 9 the following units will have been covered by both teachers. HTS follows the topics in the Oxford University Press text book, cross referencing with the AQA specifications. Biology: B1 – Cell structure and transport B3 - Organisation of the digestive system B4 – Organisation of the circulatory system B7 – Non communicable diseases Chemistry: C1 – Atomic Structure C3 – Ionic Bonding and Metallic Bonding C4a – Foundations of Quantitative Chemistry C7 – Energy Changes Physics: P1 - Energy P3 - Energy resources P4 –	End of topic assessment comprised of exam past questions at the end of each unit (30 mins). PIA feedback given. Required Practicals: -Using microscopes -Osmosis -Tests to identify macronutrients -Specific heat capacity -Density -Series and Parallel Circuits - Energy Changes

	Electrical Circuits P6 – Molecules and matter	
Suggestions for independent study and home support:		

GCSE BBC Bitesize, Seneca Learning website for recall questions and content, Kerboodle online versions of the textbook, Youtube revision videos (for example. freesciencelessons, Primrose Kitten), 'green sheets' created in department		
KEY SKILLS		
Literacy: -Key terms and definitions -Structured writing tasks	Numeracy per the spec, to include: -Arithmetic and numerical computation -Handling data -Algebra -Graphs -Geometry and trigonometry	Practical assessment: -making and recording measurements accurately -safe and appropriate use of equipment -correct use of apparatus and techniques -application of appropriate techniques -safe and careful handling of chemicals and organisms -observations of the effects of changing factors/variables

Curriculum Overview for Year 10:

Year 11 – Science GCSE		
Exam Board & course title/code	Date of Exam	% of Total Exam
Most students: • Combined Science (Trilogy) : 8464	Summer Year 11	100%
Some students: Separate Sciences • Biology : 8461 • Chemistry: 8462 • Physics: 8463	Summer Year 11	100%

Key topics	Course content	Assessment
Autumn 1:	Carousel of topics from paper 1 continues. By the end of Spring 2 the following units will have been covered by both teachers. HTS follows the topics in the Oxford University Press text book, cross referencing with the AQA specifications. Biology: B2 – Cell Division B3 – Enzyme activity in the digestive system B4 – Organisation of plants B5 – Communicable diseases B6 – Preventing and treating disease B8 – Photosynthesis B9 - Respiration Chemistry: C2 – Periodicity C3 – Covalent Bonding C4 – Chemical calculations C5 – Chemical changes C6 – Electrolysis Physics: P2 – Heating P5 – Electricity in the home P7 - Radioactivity	End of topic assessment comprised of exam past questions at the end of each unit (30 mins). PIA feedback given. Required Practicals: - Enzymes - Transpiration -How light intensity affects photosynthesis -Making salts -Electrolysis -Temperature changes Separate sciences (Triple) only RPs: -Microbiology -Titration (neutralisation)
Autumn 2:		
Spring 1:		
Spring 2:		
Summer 1:	Paper 2 Content begins following the Easter break. By the end of Summer 2 the following units will have been covered by both teachers. HTS follows the topics in the Oxford University Press text book,	End of topic assessment comprised of exam past questions at the end of each unit

	cross referencing with the AQA specifications. Biology:	(30 mins). PIA feedback given.

Summer 2:	B16 – Adaptations, interdependence & competition Chemistry: C13 – Our atmosphere Physics: P9 – Motion We also run a once a week, preperation for PPE revision lesson that aims to build skills for the mock exams in June	Required Practicals: -Reaction times -Rates of reaction -Acceleration PPE week at the end of June/Early July. All students will sit a secure past Paper 1 for Biology, Chemistry and Physics.

Suggestions for independent study and home support:

GCSE BBC Bitesize, Seneca Learning website for recall questions and content, Kerboodle online versions of the textbook, Youtube revision videos (for example. freesciencelessons, Primrose Kitten),'green sheets' created in department

KEY SKILLS

Literacy: -Key terms and definitions -Structured writing tasks	Numeracy per the spec, to include: -Arithmetic and numerical computation -Handling data -Algebra -Graphs -Geometry and trigonometry	Practical assessment: -making and recording measurements accurately -safe and appropriate use of equipment -correct use of apparatus and techniques -application of appropriate techniques -safe and careful handling of chemicals and organisms -observations of the effects of changing factors/variables

Curriculum Overview for Year 11: Science

Year 11 – GCSE Exam Board & course title/code	Date of Exam	% of Total Exam
Most students: • Combined Science (Trilogy) : 8464	Summer Year 11	100%
Some students: Separate Sciences • Biology : 8461 • Chemistry: 8462 • Physics: 8463	Summer Year 11	100%

Key topics	Course content	Assessment
Autumn 1: Autumn 2: Spring 1: Spring 2:	Paper 2 Content continues. By the end of Spring 2 the following units will have been covered by both teachers. HTS follows the topics in the Oxford University Press textbook, cross referencing with the AQA specifications. Biology: B10 – The human nervous system B11 – Hormonal control *B12 – Homeostasis in action (Triple only)* B13 – Reproduction B14 – Variation and evolution B15 – Genetics and evolution B17 – Organising ecosystems B18 – Biodiversity and ecosystems Chemistry: C8 – Rates of reaction and equilibrium C9 – Crude oil and fuels *C10 – Organic reaction (Triple only) C11 – Polymers (Triple only)* C12 – Chemical analysis C14 – The Earth's resources *C15 – Using our resources (Triple only)* Physics: P8 – Forces in balance P10 – Forces and motion	End of topic assessment comprised of exam past questions at the end of each unit (30 mins). PIA feedback given. Required Practicals: -Field investigations (measuring distribution and abundance of organisms) -Chromatography -Water purification -Force and extension -Waves -Radiation and absorption Separate sciences (Triple) only RPs: -Plant responses -Decay -Test tube reactions -Tests for ions -Light: Reflection -Thermal insulation

	P11 – Force and pressure (Triple only) P12 – Wave properties P13 – Electromagnetic waves *P14 – Light (Triple only)* P15 – Electromagnetism *P16 – Space (Triple only)*	
Summer 1:	Revision in preparation for Summer GCSE exams.	
Summer 2:	Study leave for Summer GCSE exams.	

Suggestions for independent study and home support:

GCSE BBC Bitesize, Seneca Learning website for recall questions and content, Kerboodle online versions of the textbook, Youtube revision videos (for example. freesciencelessons, Primrose Kitten),'green sheets' created in department

KEY SKILLS

Literacy: -Key terms and definitions -Structured writing tasks	Numeracy per the spec, to include: -Arithmetic and numerical computation -Handling data -Algebra -Graphs -Geometry and trigonometry	Practical assessment: -making and recording measurements accurately -safe and appropriate use of equipment -correct use of apparatus and techniques -application of appropriate techniques -safe and careful handling of chemicals and organisms -observations of the effects of changing factors/variables

Curriculum Overview for Year 12; Biology

Year 12 AS/A level Biology			
Exam Board & course title/code	Unit	Date of Exam	% of Total Exam
Key topics	Course content		Assessment
Autumn 1:	Teacher 1 • Biological molecules • Nucleic acids Teacher 2 • Cell structure • Transport across membranes		Class test and PIA CPAC required practical observations and preparation
Autumn 2:	Teacher 1 • DNA, Gene and protein synthesis Teacher 2 • Cell recognition • Exchange (started)		Class test and PIA CPAC required practical observations and preparation
Spring 1:	Teacher 1 • Genetic Diversity Teacher 2 • Exchange (completed) • Mass transport (started)		Class test and PIA CPAC required practical observations and preparation
Spring 2:	Teacher 1 • Biodiversity Teacher 2 • Mass transport (completed)		Class test and PIA CPAC required practical observations and preparation

Summer 1:	Catch up required practicals Revision for AS exams PPE	Class test and PIA CPAC required practical observations and preparation
Summer 2:	Teacher 1 • Populations in ecosystems Teacher 2 • Populations and evolution	Class test and PIA CPAC required practical observations and preparation
Suggestions for independent study and home support: www.kerboodle.com https://senecalearning.com/en-GB/ https://www.physicsandmathstutor.com/biology-revision/ Revision guide from CGP		

KEY SKILLS		
Literacy: Specific subject content- see specification	Numeracy: Use of equations Use of standard form Analysis of data for patterns or trends etc Use of graphs/charts	Other: Communication Presentation Team work Practical skills in multiple areas of biology Independent skills Research skills Time management Analytical skills

Curriculum Overview for Year 13 : Biology

Year 13 A level Biology			
Exam Board & course title/code	Unit	Date of Exam	% of Total Exam

AQA 7402/1	AS Paper 1	Summer – Year 13	35%

	Covers any content from topics 1–4, including relevant practical skills		
AQA 7402/2	AS Paper 2 Covers any content from topics 4-8, including relevant practical skills	Summer – Year 13	35%
AQA 7402/3	AS Paper 2 Covers any content from topics 1–8, including relevant practical skills	Summer – Year 13	30%

Key topics	Course content	Assessment
Autumn 1:	Teacher 1 • Photosynthesis Teacher 2 • Energy in ecosystems • Respiration	Class test and PIA CPAC required practical observations and preparation
Autumn 2:	Teacher 1 • Inherited change Teacher 2 • Response to stimuli • Nervous coordination and muscles (started)	Class test and PIA CPAC required practical observations and preparation
Spring 1:	Teacher 1 • Gene expression Teacher 2 • Nervous coordination and muscles (completed) • Homeostasis (started)	Class test and PIA CPAC required practical observations and preparation

Spring 2:	Teacher 1 • Recombinant DNA Technology	Class test and PIA
	Teacher 2 • Homeostasis (completed)	CPAC required practical observations and preparation
Summer 1:	Catch up required practicals Revision for A-level exams	Class test and PIA CPAC required practical observations and preparation
Summer 2:	A-level exams	Class test and PIA CPAC required practical observations and preparation
Suggestions for independent study and home support: www.kerboodle.com https://senecalearning.com/en-GB/ https://www.physicsandmathstutor.com/biology-revision/ Revision guide from CGP		

KEY SKILLS		
Literacy: Specific subject content- see specification	Numeracy: Use of equations Use of standard form Analysis of data for patterns or trends etc Use of graphs/charts	Other: Communication Presentation Team work Practical skills in multiple areas of biology Independent skills Research skills Time management Analytical skills

Curriculum Overview for Year 12; AS Electronics

Year 12 AS level Electronics			
Exam Board & course title/code	Unit	Date of Exam	% of Total Exam
EUCAS B490QS 6030778X	Component 2 System Design and realisation task:NEA	Internal assessment during the year	20%

Key topics	Course content	Assessment
Autumn 1: Introduction to Analogue and Digital electronics	T1. System Synthesis, introduced how we think of electronic systems input process and outputs. T1. DC Electrical Circuits, review GCSE terms like current and resistance in terms of calculating circuit values T1. Resistance& Kirchhoff's Laws are learned and applied to circuits T1. Introduction to Capacitance, developed from charge and current, describe charging and discharging T1. Input and Output subsystems and apply De Morgan's Theorem T1. Potential Dividers & Resistive Devices developed from Ohms Law and expanded into the concepts of input subsystems T2. Introduce/ review Logic Systems Gates and tables as basic digital process devices T2. Expand on the basic gates and develop understanding of combination of gates T2. Logic functions, expanded on from basic gates.e.g. a coffee machine T2. Karnaugh Maps introduced as an alternative way to solve complicated logic problems	Preparation: EDUCAS work booklets EDUCAS tutorial resources EDUCAS T1 DC Electrical Circuits test and PIA EDUCAS past papers T2 Logic Systems test and PIA

Autumn 2:	T1 Schmitt Invertors & Output devices, to expand upon student's base component knowledge T1 Semi Components PN Diode as a process T1 Semi Components Transistor as a process subsystem T2 Sequential Logic Systems development from logic gates, T2 SR flip flops and D type flip flops introduced a digital process subsystem. T2 Asynchronous counters, leading basic numerical processing systems T2 Sequential Logic Systems: NEA	Preparation: EDUCAS work booklets EDUCAS tutorial resources EDUCAS EDUCAS past papers T1 Input and Output subsystems Test and PIA T1 Semi Components Test and PIA Counters
		T2 SR flip flops test T2 Sequential Logic Systems: NEA
Spring 1:	T1 OPAMPS principles introduced gain, bandwidth, impedance. Sequential Logic Systems: Test and PIA T1 OPAMPS inverting and non-inverting introduced as process subsystems, equations, calculation and graph of operation on AC signals. T1 OPAMPS summing and buffer, link to mixing or adding voltages and the advantage of a buffer to give greater current but unity gain T2 Sequential Logic Systems: NEA T1 OPAMPS comparator as a process device.	Preparation: EDUCAS work booklets EDUCAS tutorial resources EDUCAS EDUCAS past papers T2 Sequential Logic Systems: NEA

Spring 2:	T1 OPAMPS: NEA T1Timing Circuits Capacitor charging and discharging introduced, graphs etc. T1 555 Timing Circuits and calculations introduced T1 555 timing circuits for a stable and monostable are introduced, calculations and exponential math exponential and logarithmic sills needed T11555 Natural Log calculations T2 Micro Controllers introduced via flow charts and PIC programming T2 Flow charts and programming skills T2 Micro Controllers: NEA T2 Mains Power Supply AC to DC, rectification of AC to provide DC inputs	Preparation: EDUCAS work booklets EDUCAS tutorial resources EDUCAS EDUCAS past papers OPAMPS: Test and PIA T1 OPAMPS: NEA Micro Controllers test and PIA T2Micro Controllers: NEA Timing Circuits test and PIA Mains Power Supply: test and PIA
Summer 1:	T1 Analogue Revision weeks up to AS exam. T2 Digital Revision weeks up to AS exams. AS exams in early May AS exams in early May	Preparation: EDUCAS and WJEC past paper resources will be shared, marked and

		PIA feedback and

Summer 2:	T1 Microcontroller Programming and Year 13 A level Project T2 Microcontroller Programming and Year 13 A level Project Year 12 PPEs N/A Year 12 PPEs N/A T1 Microcontroller Programming and Year 13 A level Project T2 Microcontroller Programming and Year 13 A level Project	Preparation: Year 13 coursework undertaken after AS exams T2Component 3 task 1 Micro Controllers: NEA Electronics students won't sit HTS exams in the summer as they sat external AS exams

Suggestions for independent study and home support:

https://www.wjec.co.uk/qualifications/electronics-as-a- level/?sub_nav_level=course-materials#tab_resources

https://reviseomatic.org/rOmV4/

KEY SKILLS

Literacy:	Numeracy:	Other:
Specific subject content- see specification Programming language	Use of equations - Learn - Given - Rearrange Use of standard form Ref appendix B of specification	Communication Presentation Team work Practical skills in circuit building Independent skills Research development Time management

Curriculum Overview for Year 12: BTEC Level 3

Year 12 Certificate/ Extended Certificate in Applied Science

Exam Board & course title/code	Unit	Date of Exam	% of Total Exam

601/7436/5	Unit 1	Summer – Year 12	50% - External assessment

	Principles and Applications of Science I		
601/7436/5	Unit 2 Practical Scientific Procedures and Techniques	Autumn – Year 12	50% - Internal assessment

Key topics	Course content	Assessment
Autumn 1:	Teacher 1 • A1 Laboratory equipment and its calibration • A2 Preparation and standardisation of solutions using titration • A3 Colorimetry	Practical observations and preparation Written coursework submission
	Teacher 2 • B1 Thermometers B2 Cooling curves • B2 Cooling curves	
	Teacher 3 • C1 Chromatographic techniques • C2 Application of chromatography • C3 Interpretation of a chromatogram	
Autumn 2:	• D1 Personal responsibility • D2 Interpersonal skills • D3 Professional practice	Practical observations and preparation Written coursework submission
Spring 1:	Teacher 1 • Structure and bonding in applications in	Class test and PIA

	science Teacher 2 • Cell structure and function • Cell specialisation Teacher 3 • Working with waves	
Spring 2:	Teacher 1 • Production and uses of substances in relation to properties Teacher 2 • Tissue structure and function Teacher 3 • Waves in communication • Use of electromagnetic waves in communication	Class test and PIA
Summer 1:	Catch up Revision for exams	Practice papers
Summer 2:	Revision for exams/ Exams	Practice papers
Suggestions for independent study and home support: www.kerboodle.com https://senecalearning.com/en-GB/ https://qualifications.pearson.com/content/dam/pdf/BTEC-Nationals/Applied- Science/2016/specification-and-sample-assessments/9781446938164_BTECNat_AppSci_ExtCert_Spec.pdf Revision guide from Pearson		
KEY SKILLS		

Literacy:	Numeracy:	Other:
Specific subject content- see specificatio n	Use of equations Use of standard form Analysis of data for patterns or trends etc Use of graphs/charts	Communication Presentation Team work Practical skills in multiple areas of biology Independent skills Research skills Time management Analytical skills

Curriculum Overview for Year 13: BTEC Level 3

Year 13 Extended Certificate in Applied Science

Exam Board & course title/code	Unit	Date of Exam	% of Total Exam
601/7436/5	Unit 3 Science Investigation Skills	Summer – Year 13	58% - External assessment A task set and marked by Pearson and completed under supervised conditions.
601/7436/5	Unit 8 Practical Scientific Procedures and Techniques	Autumn – Year 13	42% - Internal assessment

Key topics	Course content	Assessment
Autumn 1:	Teacher 1 • A1 Structure of the musculoskeletal system • A2 Function of the musculoskeletal system • A3 Health matters and treatments related to the musculoskeletal system	Practical observations and preparation Written coursework submission
	Teacher 2 • B1 Structure of the lymphatic system • B2 Function of the lymphatic system • B3 Health matters and treatments related to the lymphatic system	
	Teacher 3 • C1 Structure of the digestive system • C2 Function of the digestive system • C3 Health matters and treatments related	

Autumn 2:	• Research and coursework preparation	Written coursework submission

Spring 1:	Teacher 1 • Planning a scientific investigation • Data collection, processing and analysis/interpretation • Drawing conclusions and evaluation • Enzymes in action	Class test and PIA Practical observations and preparation Practice papers
	Teacher 2 • Planning a scientific investigation • Data collection, processing and analysis/interpretation • Drawing conclusions and evaluation • Plants and their environment	
	Teacher 3 • Planning a scientific investigation • Data collection, processing and analysis/interpretation • Drawing conclusions and evaluation • Enzymes in action • Energy content of fuels	
Spring 2:	Teacher 1 • Planning a scientific investigation • Data collection, processing and analysis/interpretation • Drawing conclusions and evaluation • Diffusion of molecules	Class test and PIA Practical observations and preparation Practice papers

	Teacher 2 • Planning a scientific investigation • Data collection, processing and analysis/interpretation • Drawing conclusions and evaluation • Plants and their environment	
	Teacher 3 • Planning a scientific investigation • Data collection, processing and analysis/interpretation • Drawing conclusions and evaluation • Enzymes in action • Electrical circuits	
Summer 1:	Catch up Revision for exams	Practice papers
Summer 2:	Revision for exams/ Exams	Practice papers
Suggestions for independent study and home support: www.kerboodle.com https://senecalearning.com/en-GB/ https://qualifications.pearson.com/content/dam/pdf/BTEC-Nationals/Applied- Science/2016/specification-and-sample-assessments/9781446938164_BTECNat_AppSci_ExtCert_Spec.pdf Revision guide from Pearson		
KEY SKILLS		

Literacy:	Numeracy:	Other:
Specific subject content- see specification	Use of equations Use of standard form Analysis of data for patterns or trends etc Use of graphs/charts	Communication Presentation Team work Practical skills in multiple areas of biology Independent skills Research skills Time management Analytical skills

Curriculum Overview for Year 12: Physics

Year 12 AS/A level Physics		
Exam Board & course title/code Key topics	Unit Course content	Date of Exam % of Total Exam Assessment
Autumn 1: T1 – Particles and Radiation T2 – Waves and optics Both – Practical Skills	Teacher 1: Particles and Matter Quarks and Leptons Quantum Phenomena Teacher 2 Reviews Transition work Numeracy skills Waves Stationary and Progressive (RP 1)	• Particles and Matter Test • Quarks and Leptons Test • Waves Test • Required Practical 1
Autumn 2: T1 – Particles and Radiation Mechanics and Materials T2 – Electricity Both – Practical Skills	Teacher 1: Finish Quantum Phenomena Forces in equilibrium SUVAT and Projectile motion Teacher 2: Optics RP2 Electric Current RP5	• Particles and Radiation Section test • Forces in equilibrium test • Waves and Optics section test • Required Practical 5
Spring 1: T1- Mechanics and Materials T2 – Electricity	Teacher 1: RP3 Newton's Laws Momentum	• Required Practical 3 • Motion Test • Newtons law test

Both- Practical Skills	Teacher 2: Electric Current DC Circuits RP6	• Electric Current test • Required Practical 6 • Electricity Section test
Spring 2: Both – Mechanics and Materials Practical Skills	Teacher 1: Momentum Work Energy and Power Exam Prep Teacher 2: Materials RP 4 Exam Prep	• Momentum Test • Materials Test or work energy power test • Mechanics and Materials section test • Required Practical 4
Summer 1: Both – Exam Prep	Both – Revision AS – exams just before and after half term	AS exams
Summer 2: Begin A-Level only content Teacher 1: Further Mechanics Teacher 2: Fields	Teacher 1: Circular motion RP 7	• Required Practical 7 • Circular Motion Test • Gravitational Fields test

	Teacher 2: Gravitational Fields	

Suggestions for independent study and home support:

Independent revision guides for each topic
www.kerboodle.com
Revision Guides and texts from CGP

KEY SKILLS

Literacy:	Numeracy:	Other:
Specific subject content- see specification	Use of equations - Learn - Given - Rearrange Use of standard form Graphical techniques Linear transformations	Communication Presentation Team work Practical skills Independent skills Research development Time management

Curriculum Overview for Year 13: Physics

Year 13 A level Physics			
Exam Board & course title/code	Unit	Date of Exam	% of Total Exam
AQA 7408(A- E)	Paper 1 Sections 1-4 and Circular and Periodic Motion	Summer – Year 13	34%
	Paper 2 Sections 6-8 with assumed knowledge of all content	Summer – Year 13	34%
	Paper 3 Practical Skills and analysis and Option topic	Summer – Year 13	32%
	CPAC assessment (Required Practicals)	Summer – Year 13	Pass/Fail

Key topics	Course content	Assessment
Autumn 1: T1 – Further Mechanics and Thermal Physics T2 – Fields Both Practical Skills	Teacher 1: Periodic Motion Thermal Physics Teacher 2 Electric Fields Capacitors	• Optional topic – summer work assessment • Periodic Motion test • Electric Fields Test • Thermal Physics Test
Autumn 2: T1 Further Mechanics and Thermal	Teacher 1: Gas Laws Radioactivity	• Further Mechanics and Thermal Physics

Physics Nuclear Physics T2 Fields Both – Practical Skills	Teacher 2: Capacitors RP9 Magnetic Fields RP10 Induction	Section test • Capacitors Test • Required Practical 9 • Required Practical 10 •
Spring 1: T1- Nuclear Physics T2 – Fields Both- Practical Skills	Teacher 1: Nuclear Energy Teacher 2: Induction RP11	• Nuclear Physics Section Test • Fields Section Test • Required Practical 11 • PPEs
Spring 2: Both – Option topics Exam Prep	Teacher 1: RP 8 RP 12 Option Topics Exam Prep Teacher 2: Option Topics Exam Prep	• Required Practical 8 • Required Practical 12 • Paper 3 PPE

Summer 1: Both – Exam Prep	Both – Revision A Level – exams just before and after half term	
Summer 2:	EXAMS	•

Suggestions for independent study and home support: Independent revision guides for each topic www.kerboodle.com Revision Guides and texts from CGP		
KEY SKILLS		
Literacy: Specific subject content- see specification	Numeracy: Use of equations - Learn - Given - Rearrange Use of standard form Graphical techniques Linear transformations	Other: Communication Presentation Team work Practical skills Independent skills Research development Time management

Curriculum Overview for Year 12: Chemistry

Year 12 AS/A level Chemistry		
Exam Board & course title/code Key topics	Unit Date of Exam Course content	% of Total Exam Assessment
Autumn 1:	Atomic Structure Amount of Substance Bonding (started)	Class test and PIA CPAC required practical observations and preparation
Autumn 2:	Bonding (completed) Energetics Kinetics Equilibria and Redox	Class test and PIA CPAC required practical observations and preparation
Spring 1:	Periodicity Group 2, the alkaline earth metals Group 7, the halogens Introduction to organic Alkanes	Class test and PIA CPAC required practical observations and

		preparation

Spring 2:	Halogenoalkanes Alkenes Alcohols Organic Analysis	Class test and PIA CPAC required practical observations and preparation
Summer 1:	Catch up required practicals Revision for AS exams	Class test and PIA CPAC required practical observations and preparation
Summer 2:	Thermodynamics Potentially start rate equations and Kp	Class test and PIA CPAC required practical observations and preparation
Suggestions for independent study and home support: http://www.a-levelchemistry.co.uk/ https://www.physicsandmathstutor.com/chemistry-revision/ https://senecalearning.com/en-GB/blog/a-level-chemistry-revision/		
KEY SKILLS		
Literacy:	Numeracy:	Other:

Specific subject content- see specificatio n	Use of equations Use of standard form Analysis of data for patterns or trends etc	Communication Presentation Team work Practical skills in multiple areas in chemistry Independent skills Research skills
	Use of graphs/charts	Time management Analytical skills

Curriculum Overview for Year 13: Electronics

Year 13 A level Electronics			
Exam Board & course title/code	Unit	Date of Exam	% of Total Exam
EUCA S B490 QS 6030778X	Component 1 Principles of Electronics	Summer – Year 13	40%
	Component 2 Applications of Electronics	Summ er Year 13	40%
	Component 3 System Design and realisation task: NEA	Internal assessment during the year	20%
Key topics	Course content		Assessment

Autumn 1:	T1 Further Main Power Supplies - voltage regulators introduced as improved power supplies for electronic systems T1 AC circuits and passive filters, apply Year 12 AS capacitor theory and expand upon the concept of time constant T1Reactance and frequency and Resonance XL and XC. T1Reactance and frequency and Resonance XL and XC using AS OPAMP theory. T1 Q factor and circuit analysis as a measure of how good a filter is. T1 Instrumentation Systems, Potential dividers and strain gauges as applied potential divider circuits. T1 Grey code and optical shaft encoders used as a way to control process devices T1 Audio Systems, gain and dB Audio Mixer, applications of filters, introduce active e.g. with gain. T2 Sequential Logic Systems, expand on AS Logic gates,	Preparation: EDUCAS work booklets EDUCAS tutorial resources EDUCAS EDUCAS past papers Ch 4 AC circuits test and PIA Ch7 Instrumentation test and PIA Ch6 Audio Test and PIA
	introduce SR flip flop as a memory device T2 D type flip flops are introduced as a 4-bit memory data storage system T2 Sequential Counters and BCD counters introduced to show how we count in base 10 T2 Karnaugh maps skills further developed, complexity is greater than year 12 T2 Digital Communications and forms of modulation TDM, PAM, PPM PCM introduced T2 Schmitt Triggers revised and applied to regenerating shift registers	Ch1 Further Sequential logic Test and PIA

Autumn 2:	T1 The Power amplifier, introduce push pull OPAMPS and the Pmax equation. T1 High Power Switching: introduce Thyrister and Thyrac operation. T1Optical communications TIR types of fibre dB losses, attenuation and transmission of data via IR TTR and RVRs T1Introduce Main Project, spring term of year 13 T2 Signal conversion, changing AC to DC \and vice versa T2 ADC and applications, for example how an iPod/ phone changes the digital data into music T2 DAC and applications, how we communicate and transfer voice into electronic data for transmission. T2 Communication Systems as transmitters and receivers are introduced T2 Communication Systems and bandwidth, how much data can be stored and sent in different systems T2 Communication Systems and bandwidth, as the range of frequencies used is investigated, multiplexing of signals and losses in dB T2 Wireless transmissions- modulation and signal depth of modulation, investigated as ways to quantify and compare different communication systems	Preparation: EDUCAS work booklets EDUCAS tutorial resources EDUCAS EDUCAS past papers Optoelectronics Presentation with PIA Ch13 Further Semiconductor test and PIA Ch 9 Communications test and PIA

Spring 1:	T2 Finish T&L T2 Support Main Project, spring term of year 13 T1 and T2 Coursework Task 2 Introduced (50 marks) – is a substantial system development including analogue and digital sub-systems in an integrated design.	Preparation: EDUCAS work booklets EDUCAS tutorial resources EDUCAS EDUCAS past papers

Spring 2:	Coursework Task 2 completed (50 marks) – is a substantial system development including analogue and digital sub-systems in an integrated design. T1 Exam Revision T2 Exam Revision	Preparation: EDUCAS work booklets EDUCAS tutorial resources EDUCAS EDUCAS past papers
Summer 1:	T1 Exam Revision T2 Exam Revision Students leave May half term year 13 for A level examination	Preparation: EDUCAS work booklets EDUCAS tutorial resources EDUCAS EDUCAS past papers
Summer 2:	Students leave May half term year 13 for A level examination	
Suggestions for independent study and home support: https://www.wjec.co.uk/qualifications/electronics-as-a- level/?sub_nav_level=course-materials#tab_resources https://reviseomatic.org/rOmV4/		
KEY SKILLS		

Literacy:	Numeracy:	Other:
Specific subject content- see specification Programming language	Use of equations -Learn -Given -Rearrange Use of standard form Ref appendix B of specification	Communication Presentation Team work Independent skills Research development Time management

Curriculum Overview for Year 13: Chemistry

Year 13 A level Chemistry			
Exam Board & course title/code	Unit	Date of Exam	% of Total Exam
AQA 7405/1	A Level Paper 1 Inorganic and Physical Chemistry	Summer – Year 13	35%
AQA 7405/2	A Level Paper 2 Organic and Physical Chemistry	Summer – Year 13	35%
AQA 7405/3	A Level Paper 3 Practical Skills & Synoptic	Summer - Year 13	30%
Key topics	Course content		Assessment

Autumn 1:	Transition Metals Review and Required Practical Thermodynamics Review Rate equations Electrode Potentials	Class test and PIA CPAC required practical observations and preparation
Autumn 2:	Acids and Bases Carbonyl Chemistry Aromatics and Amines	Class test and PIA CPAC required practical observations and preparation
Spring 1:	Polymers Amino acids, Proteins and DNA Further synthesis and analysis	Class test and PIA CPAC required practical observations and preparation
Spring 2:	Period 3 Elements Required Practical catch up Revision	Class test and PIA CPAC required practical observations

		and preparation
Summer 1:	Revision A Level Exams	Class test and PIA CPAC required practical observations and preparation
Summer 2:		
Suggestions for independent study and home support: http://www.a-levelchemistry.co.uk/ https://www.physicsandmathstutor.com/chemistry-revision/ https://senecalearning.com/en-GB/blog/a-level-chemistry-revision/		

KEY SKILLS		
Literacy: Specific subject content- see specification	Numeracy: Use of equations Use of standard form Analysis of data for patterns or trends etc Use of graphs/charts	Other: Communication Presentation Team work Practical skills in multiple areas in chemistry Independent skills Research skills Time management Analytical skills

THE HOLY TRINITY SCHOOL SCIENCE DEPT ASSESSMENT, MARKING AND REPORTING POLICY DOCUMENT for 2022/2023

Marking Policy

Science marking will be subdivided into formative and summative marking opportunities with agreed feedback points where the teacher will use PIA. There will also be identified self and peer marking opportunities with self and peer PIA process to develop reflective and critical learners and be able to evaluate their own and others work effectively over the key stage.

The Science department will achieve these aims by planning the following types of assessment into their schemes of work:

- Formative/diagnostic - what do students need to do to improve?
- Summative - recording of overall achievement/attainment at critical points, e.g., end of year exams, Teacher Assessments at end of KS3, KS4 & KS5 which is moderated. This will monitor progress against the Big Ideas (Appendix 2)

As a result of these assessments, teachers will adjust their lesson plans and schemes of work.

Teachers will record marks to:

- Monitor progress over time.
- Provide accurate historic information for students/parents/other teachers.
- Provide evidence to support reporting and target setting.

Marks should be accessible to Line Managers and the department will record agreed data on SIMS. Subject leaders will monitor and track data through the year and will compare to SIMS and SISRA reporting.

To support these aims:

Teachers will access baseline data: attendance, and other information such a of key groups; PP, HA EAL and to inform their planning and teaching.

Key Stage 3 Assessment – 2022/23

- Teachers will be expected to mark books once a half term
- Teachers will use the PIA format of marking with a purple pen
- Teachers should use this opportunity to check for spelling errors and misconceptions within the topic which can then be actioned by the students using green pen
- Students will be given the opportunity at the end of a topic to complete a formal assessment which will be marked and be given directed time to green pen their improvements.
- There will be one of these a term, each associated with each topic: Biology, Chemistry and Physics.
- Students will be given a formal PIA sheet which will identify their strengths and areas for improvement following each assessment. (See appendix 1)

Year 7	Biology	Chemistry	Physics	Marking

Autumn	Bio1 Movement and Cells (10) +	Chem1 Movement of Particles (7) +	Phys1 Speed, Gravity and Energy (10) +	3 x Assessments 3 x DIRT

	End of Topic Test + PI A	End of Topic Test + PI A	End of Topic Test + PI A	1 x Bookmarking per half term
Spring	Bio2 Variation and Reproduction (8) + End of Topic Test + PI A	Chem2 Particle Model and Mixtures (8) + End of Topic Test + PI A ChemE Earth Structure and Universe (9) + End of Topic Test + PI A	Phys2 Voltage, Current and Resistance (5) + End of Topic Test + PI A	3 x Assessments 3 x DIRT 1 x Bookmarking per half term

Summer	Bio3 Interdependence (7) + End of Topic Test + PI A	Chem3 Acids, Alkalis and reactions of metals (12) + End of Topic Test + PI A	Phys3 Sound and Light (9) + End of Topic Test + PI A	3 x Assessments 3 x DIRT 1 x Bookmarking per half term
Year 8				
Autumn	Bio4 Organisms and Exchange of Substances (10) + End of Topic Test	Chem4 Matter Periodic Table Trends (9) + End of Topic Test +	Phys4 Forces and Pressure (6) + End of Topic Test +	3 x Assessments 3 x DIRT 1 x Bookmarking per half term
	+ PIA	PIA	PIA	

Spring	Bio5 Ecosystems (7) + End of Topic Test + PI A	Chem5 Reactions (7) + End of Topic Test + PI A	Phys5 Electromagnets (5) + End of Topic Test + PI A Phys7 Waves (5) + End of Topic Test + PI A	3 x Assessments 3 x DIRT 1 x Bookmarking per half term
Summer	Bio6 Genes (8) + End of Topic Test + PI A	Chem6 Earth Climate and Earth Resources (5) + End of Topic Test + PI A	Phys 6 Ener gy + End of Topic Test (5) + PI A	3 x Assessments 3 x DIRT 1 x Bookmarking per half term

- KS3 Assessments will increase in demand from Year 7 to Year 8 to ensure the foundational knowledge is assessed in preparation for Key Stage 4 but also ensures students are building the skills to show their ability to apply the science to new situations and extend their through questions of more challenge

	Key Stage 4	Year 8	Year 7
AO1 – Knowledge	40	40	70
AO2 – Application	40	45	30
AO3 - Extension	20	15	0

- Teachers will record this on the departmental SIMs mark book using the following grade boundaries (to be developed)

- Student will record results from their assessments in the yellow tracker sheet stuck into their exercise book for them to see where they are making progress in relation to target
- SIMs will be set up for each end of topic test for teachers to input percentage and grade for each test
- This will enable science staff to report on the termly KS3 Data Sweeps
- All KS3 data will be used, alongside GCSE prediction, to inform setting for the Year 9 students.

Year 7 Grade Boundaries			**Year 8 Grade Boundaries**		
Score	%	Grade	Score	%	Grade
21	70	5	21	70	6
18	60	4	18	60	5
15	50	3	15	50	4
12	40	2	12	40	3
9	30	1	9	30	2
6	20	E3	6	20	1
			4	15	E3

Key Stage 3 Homework – 2022/23

- All teachers are to be set homework on Educake with the link placed on SMHW to record that homework is being set
- Teachers are to use SMHW to record where students have and have not completed their homework to ensure transparency between the school and parental access to SMHW
- Year 7 quizzes will consist of 20 questions whereas year 8 will then increase in demand to 25
- Homework quizzes are based on retrieval practice of topics from the previous academic year/term
- Homework quizzes are saved templates within Educake and the order in which they are given will be given by KS3 Leader
- Quizzes will ensure that students are given 2x opportunities to revisit each of the science disciplines each half term
- KS3 homeworks are to only be set by the lead teacher and will be set each Monday with students to complete the task by the Friday.
- Students who do not complete homework are to be held by KS3 Leader for imposition on a Tuesday evening in order to complete their task
- Teachers are to inform KS3 leader of these students by Tuesday morning
- Following the initial use of Educake in the Autumn Term, Teacher should then

be using Educake for prepare to learn tasks at Key Stage 3 for Spring and Summer Lessons

- Key Stage 3 Science
- Track Progress
- Pick Discipline – alternative Bio/Chem/Phys
- Pick unit you know has been covered

    - Pick your class
    - Identify area of weakness
    - Plan a prepare to learn task that look at this area e.g., ExamPro KS3 Question
- Teachers should as a minimum, give students their homework reports at parents evening to show strengths and weaknesses. This may also be done on a termly basis and stuck into books.

Key Stage 4

- Teachers will be expected to mark books once a term
- Teachers will use the PIA format of marking with a purple pen
- Teachers should use this opportunity to check for spelling errors and misconceptions within the topic which can then be actioned by the students using green pen
- Students will be given the opportunity at the end of a topic to complete a formal assessment which will be marked and be given directed time to green pen their improvements.
- There will be one of these a term, each associated with each topic: Biology, Chemistry and Physics.
- Students will be given a formal PIA sheet which will identify their strengths and areas for improvement following each assessment. (See appendix 1)

	Biology	**Chemistry**	**Physics**	**Marking**
Year 9	B1 + EOT + PIA B2 + EOT + PIA B3 + EOT + PIA B4 + EOT +PIA	C1 + EOT + PIA C2 + EOT + PIA C3 + EOT + PIA	P2 + EOT + PIA P6 + EOT + PIA P7 + EOT + PIA	1x assessment per topic 1x PIA/DIRT per topic 1 x Bookmarking per half-term
Year 10	B5 + EOT + PIA B6 + EOT + PIA B7 + EOT + PIA B8 + EOT + PIA B9 + EOT + PIA B16 + EOT + PIA	C4 + EOT + PIA C5 + EOT + PIA C6 + EOT + PIA C7 + EOT + PIA	P1 + EOT + PIA P4 + EOT + PIA P5 + EOT + PIA	1x assessment per topic 1x PIA/DIRT per topic 1 x Bookmarking per half-term June PPE's
Year 11	B10 + EOT + PIA B11 + EOT + PIA B12(Trip) + EOT + PIA	C8 + EOT + PIA C9 + EOT + PIA C10 (Trip) + EOT + PIA	P8 + EOT + PIA P9 + EOT + PIA P10 + EOT + PIA	1x assessment per topic 1x PIA/DIRT per topic

	B13 + EOT + PIA B14 + EOT + PIA B15 + EOT + PIA B17 + EOT + PIA	C11 (Trip) + EOT + PIA C12 + EOT + PIA C13 + EOT + PIA	P11 + EOT + PIA P12 + EOT + PIA P13 + EOT + PIA P14(Trip) + EOT + PIA	1 x Bookmarking per half-term December PPE's March PPE's
	B18 + EOT + PIA	C14 + EOT + PIA	P15 + EOT + PIA P16(Trip) + EOT + PIA	

- Teachers will record this on the departmental SIMs mark book using the following grade boundaries (to be developed)
- Student will record results from their assessments in the yellow tracker sheet stuck into their exercise book for them to see where they are making progress in relation to target
- Pupil Progress will be set up for each end of topic test for teachers to input a grade for each test
- This will enable science staff to report on the KS4 Data Sweeps

Grade Boundaries by Year

Year 9 Grade Boundaries		
Score	%	Grade
24	80	3+
22	73	3
20	67	3-
18	60	2+
16	53	2
14	47	2-
12	40	1+
10	33	1
8	27	1-
6	20	E3+
4	13	E3

2	7	E3-

Year 10/11 Foundation Grade Boundaries			Year 10/11 Higher Grade Boundaries			Year 10/11 Triple Grade Boundaries		
Score	%	Grade	Score	%	Grade	Score	%	Grade
24	80	5	27	90	9	28	93	9
20	20	4	24	80	8	26	87	8
15	15	3	21	73	7	24	80	7
9	9	2	18	66	6	21	70	6
5	5	1	15	57	5	18	60	5
			12	47	4	15	50	4
			9	30	3			

Key Stage 4 Homework – 2022/23

- All teachers are to be set homework on Educake with the link placed on SMHW to record that homework is being set
- Teachers are to use SMHW to record where students have and have not completed their homework to ensure transparency between the school and parental access to SMHW
- Year 9-11 quizzes will consist of 25-30 questions, difficulty will vary by group.
- Homework quizzes are based on retrieval practice of topics from the previous academic year/term
- Homework quizzes are saved templates within Educake and the order in which they are given will be given by KS4 Leader
- KS4 Homeworks are to only be set by the lead teacher and will be set each Monday with students to complete the task by the Friday.
- Following the initial use of Educake in the Autumn Term, Teacher should then be using Educake for prepare to learn tasks at Key Stage 4 for Spring and Summer Lessons
    - Key Stage 4 Science
    - Track Progress
    - Pick Discipline – alternative Bio/Chem/Phys
    - Pick unit you know has been covered
    - Pick your class
    - Identify area of weakness
    - Plan a prepare to learn task that look at this area e.g., ExamPro KS4 Past Exam Question
- Teachers should as a minimum, give students their homework reports at parents evening to show strengths and weaknesses. This may also be done on

a termly basis and stuck into books.

Key Stage 5

Year 12

The form of this assessment will depend on the topic and the stage of the course. This could be via the use of past exam questions or Practical assessments using PIA principles. After a series of theory lessons has been taught (over several weeks), the teacher should allow time for DIRT activities to take place.

- Short subunit assessments at regular intervals
- End of unit test/mock
- New Practical Skills Assessments
- A/ AS level Electronics also has regular coursework assessments built into it.BTEC must be submitted on the specified date, with a week to mark and the students have 10 school days to resubmit any improvements. Prior to submission students well have self and peer assessment opportunities. Feedback will provide in line with the guidelines issued by EDEXCEL

Year 13

The form of this assessment will depend on the topic and the stage of the course. This could be via the use of past exam questions or Practical assessments using PINS principles. After a series of theory lessons has been taught (over several weeks), the teacher should allow time for DIRT activities to take place.

- Short subunit assessments at regular intervals
- End of unit test/mock
- Practical Skills Assessments
- A2 electronics also has regular coursework assessments built into it
- BTEC must be submitted on the specified date, with a week to mark and the students have 10 school days to resubmit any improvements. Prior to submission students well have self and peer assessment opportunities. Feedback will provide in line with the guidelines issued by EDEXCEL

Appendix 1:

PIA

P – Positive

What is good about this work? Which skills have been demonstrated well here?

I – Improvement

What mistakes have been made? Which areas have not been done correctly?

A- Action

What should be done now to make progress? Which ways can a student review/make further progress on this topic? What remedial work needs to be put in place.

Appendix 2:

The big Ideas in Science

- Subject Specific Knowledge
- Literacy - applied in exams and in working scientifically
- Numeracy - applied in exams and in working scientifically
- Working Scientifically (HSW) – research, plan, results, present data, analysis of results

Appendix 3:

Internal moderation

1. Staff will be asked to submit 3 marked pieces of work
2. This will be peer assessed and verified by their subject leader
3. Follow up conversations will take place with the Dept. or on a one-to-one basis
4. Scanned copied of approved levelled pieces of work will be help in each topic folder to enable staff to cross reference and to plan.

Appendix 4:

Holy Trinity Church of England School

Whole School Marking

Codes

The following correction symbols are to be used across the school to identify specific features of students' work. Other subject specific symbols, deemed appropriate by the teacher, may also be used. The codes work alongside meaningful teacher comments which are positive, formative and inform students of how their work can be improved.

Where appropriate, staff should insist on correction; misspelt subject specific words are considered a priority and corrections should be recorded by students on their work in green pen.

Over correction is best avoided as this can be discouraging; instead teachers should use the codes to identify specific learning needs.

In the Margin (by teacher)	On your work (by student)	What it means
Sp	dose	Spelling error
C	dave lives in crawley	Capital letter error
P	dont	Punctuation error
//	//The next day	Start a new paragraph here
T	T He screams and ran out of the room	Tense (verb) error or shift
~	Two cat sat in the mat	Indicates a lack of clarity or confusion

^	sat The cat^on the mat	You have missed something out

X	~~The world is flat~~	Indicates factual error, lack of relevance or repetition
□	□	Indicates particularly good point

Appendi

PIA

P – Positive

What is really good about this work? Which skills have been demonstrated really well here?

I – Improvement

What mistakes have been made? Which areas have not been done correctly?

A- Action

What should be done now to make progress? Which ways can a student review/make further progress on this topic? What remedial work needs to be put in place?

Appendix 2:

The Big Ideas in Science

- Subject Specific Knowledge
- Literacy - applied in exams and in working scientifically
- Numeracy - applied in exams and in working scientifically
- Working Scientifically (HSW) – research, plan, results, present data, analysis

of data/results Appendix 3:

Internal moderation (dept. meetings)

1. Staff will be asked to submit 3 marked pieces of work
2. This will be peer assessed and verified by their subject leader
3. Follow up conversations will take place with the Dept. or on a one to one basis
4. Scanned copied of approved levelled pieces of work will be help in each topic folder to enable staff to cross reference and to plan.
5. Work Scrutinise will be use to check, develop and support marking practice in Science

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Three Year Data Overview:

Breakdown of subject cohort

Year group	Total students	% of PP students	% of SEND students	% of male students	% of female students	% of HA students
7	210	27%	19%	52%	48%	25%
8	210	29%	21%	52%	48%	27%
9	208	28%	25%	47%	53%	28%
10						
Combined Science	179	23%	29%	46%	54%	17%
Biology	31	19%	6%	58%	42%	87%
Chemistry	31	19%	6%	58%	42%	87%
Physics	31	19%	6%	58%	42%	87%
11						
Combined Science	180	26%	28%	46%	54%	22%
Biology	30	3%	10%	43%	57%	80%
Chemistry	30	3%	10%	43%	57%	80%
Physics	30	3%	10%	43%	57%	80%
12						
Biology	17	12%	6%	29%	71%	12%
Chemistry	7	14%	0%	43%	57%	14%
Physics	8	0%	0%	100%	0%	0%
13						
Biology	9	0%	11%	33%	67%	78%
Chemistry	7	0%	0%	43%	57%	86%
Physics	10	0%	0%	90%	10%	60%

Past 4 years results

Year 11

Combined Science GCSE	2018 **(Science Double Award)**	2019	2020	2021
Cohort number	364	366	376	408
% above target	28.6%	31.7%	33.5%	27.5%
% on target	15.4%	15.3%	21.8%	15.7%
% below target	56%	52.5%	44.7%	56.9%

Biology GCSE	2018	2019	2020	2021
Cohort number	19	12	18	7
% above target	42.1%	33.3%	50%	100%
% on target	26.3%	41.7%	50%	0%
% below target	31.6%	16.7%	0%	0%
Chemistry GCSE	2018	2019	2020	2021
Cohort number	18	11	18	7
% above target	38.9%	45.5%	55.6%	71.4%
% on target	44.4%	36.4%	38.9%	14.3%
% below target	16.7%	18.2%	5.6%	14.3%
Physics GCSE	2018	2019	2020	2021
Cohort number	18	11	18	7
% above target	66.7%	72.7%	66.7%	85.7%
% on target	27.8%	18.2%	27.8%	14.3%
% below target	5.6%	9.1%	5.6%	0%

Year 13

Biology A level	2018	2019	2020	2021
Cohort number	9	20	12	8
% above target	11.1%	20%	41.7%	25%
% on target	0%	25%	41.7%	50%
% below target	88.9%	55%	16.7%	25%
Chemistry A level	2018	2019	2020	2021
Cohort number	8	17	9	8
% above target	12.5%	17.6%	33.3%	37.5%
% on target	0%	41.2%	22.2%	12.5%
% below target	87.5%	41.2%	44.4%	50%
Physics A level	2018	2019	2020	2021
Cohort number	8	12	8	10
% above target	12.5%	41.7%	37.5%	40%
% on target	12.5%	33.3%	50%	20%
% below target	75%	25%	12.5%	40%
Science BTEC	2018	2019	2020	2021
Cohort number	12	4	11	4
% above target	75%	0%	27.3%	0%
% on target	25%	25%	45.5%	50%
% below target	0%	75%	27.3%	50%