

Subject Applied Science Double

Adjustments due to covid. Due to the varied experience of students from multiple schools and long gap between learning and re-using, time has been built in to cover all KS4 linked learning to whatever depth is required. The teacher assesses prior knowledge through questioning and either completely re-teaches, interleaves key pieces of knowledge into successive lessons or provides differentiated independent learning tasks should some students be further behind than others.

Unit 4 has been moved to the end of the year/end of year 13 due to covid visiting allowances at the hospital. All other units moved up.

SMSC AND BRITISH VALUES

Spiritual

1. Developing personal values and beliefs
2. Experiencing fascination, awe and wonder
3. Exploring the values and beliefs of others
4. Understanding human feelings and emotions
5. Using imagination and creativity in learning

Moral

1. Developing and expressing personal views or values
2. Investigating moral values and ethical issues
3. Recognising right and wrong and applying it
4. Understanding the consequences of actions

Social

1. Developing personal qualities and using social skills
2. Participating, cooperating, and resolving conflicts
3. Understanding how communities and society's function

Cultural

Exploring, understanding,
and respecting diversity

Participating and
responding to cultural
activities

Preparing for life in modern
Britain

Understanding and
appreciating personal
influences

British values

Democracy

Rule of law

Individual liberty

Mutual respect

Tolerance

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Year 12						
When	WHAT & WHY WILL THEY LEARN?		New Skill = NS Revisit = R Revision = RV	Stretch and Challenge (Differentiation – how will you stretch the most able to achieve top grades?)	CIEAG/Extension on Enrichment	KS4 PRIOR LEARNING
Term Plan	<u>KNOWLEDGE & SKILLS</u>	Assessment Objective		Band 5 = Informed Band 6 = Mature	Trips, workshops, speakers, local environment and experiences SMSC and BV	
	<u>Transition Task</u> Preparation for unit 2 practical methods	Unit 2 A,B,C pass criteria	Re-visit from GCSE content	Informed: Methods based on GCSE knowledge Mature: Risk assessments using their own critical thinking		GCSE combined and triple science across all three schools teaches all three methods for the transition task. Students will come showing their own knowledge and therefore where their weaknesses are so teachers can individualise teaching plans
Term 1 and 2A	A: Understand the importance of health and	A: A report describing health and safety legislation relevant to	R: Explaining measures taken	Informed:	Trips to both a local factory (whitworths)	Prior knowledge from technology lessons varies from

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<p>Unit 4 Assignment A and D to be completed together due to similar content Then either B or C</p>	<p>safety in scientific organisations</p> <p>D: Understand how scientific information may be stored and communicated in a workplace laboratory</p>	<p>an organisation, describing the hazards and discussing aspects of health and safety management.</p> <p>A report containing:</p> <ul style="list-style-type: none"> • a description of the information stored and used in the laboratory • a description of how useful information can be obtained from large data sets • analysis of the communication channels in the organisation • evaluation of the benefits and issues 	<p>NS: Observations at a workplace</p> <p>NS: Comparison</p> <p>NS: Evaluation of procedures</p> <p>R: Describing processes</p> <p>R: Observations at a workplace</p> <p>NS: Analysis of information</p> <p>R: Evaluation</p>	<p>A.P1 Explain how health and safety measures in a scientific organisation comply with legislation.</p> <p>A.P2 Describe the potential hazards relevant to different scientific working environments.</p> <p>Mature: A.M1 Compare the health and safety measures taken in relation to legislation for different scientific working environments, referencing potential hazards.</p> <p>A.D1 Evaluate the measures taken for different working environments to ensure high standards of health and safety that comply with legislation.</p> <p>Informed: D.P7 Explain how scientific information in a workplace laboratory is recorded and processed to meet the needs of the customer and to ensure traceability.</p> <p>D.P8 Explain how useful scientific information is obtained from large data sets and the potential issues and benefits.</p> <p>Mature:</p>	<p>and Northampton General hospital</p> <p>M2, M3, M4 So1, So2, So3 Cu 3, Cu4 BV 2, BV4,</p>	<p>school to school so teaching pace is changed dependant on how much health and safety students are aware of</p> <p>Skills from GCSE such as observations and describing will be used</p>
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	<p>B: Explore manufacturing techniques and testing methods for an organic liquid</p>	<p>involved in making large volumes of data available to others.</p> <p>A report containing:</p> <ul style="list-style-type: none"> • notes and results from making and testing an organic liquid • a description of the principles behind the preparative methods and tests used • analysis of ways to improve yield and purity and the reliability of testing methods as a guide to purity • an explanation of the principles behind the industrial manufacture and testing of the liquid • an observation report by the teacher 	<p>NS: Practical skills of reflux, vacuum filtration will be used</p> <p>R: Analysis</p>	<p>D.M6 Analyse the differences in the storage and communication of scientific information in different workplace laboratories.</p> <p>D.D4 Evaluate the challenges to organisations in making available large volumes of scientific information.</p> <p>Informed:</p> <p>B.P3 Correctly prepare and test the purity of an organic liquid and draw conclusions.</p> <p>B.P4 Describe the industrial manufacture and testing of an organic liquid.</p> <p>Mature:</p> <p>B.M2 Demonstrate skilful application of techniques in preparing and testing the purity of an organic liquid and draw detailed conclusions. B.M3 Compare the laboratory and industrial manufacture and testing of an organic liquid.</p> <p>B.D2 Analyse the factors affecting the yield and purity of an organic liquid in the laboratory and their relevance to its industrial manufacture.</p>	<p>Sp2, M3, M4 So1, So3 Cu 3</p>	<p>GCSE skills of following a method will be used however this is an A level practical where they will not have learnt the practical skills yet. GCSE content of alcohols and esters will only have been covered at triple so teaching will depend on previous learning</p>
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	<p>C: Explore manufacturing techniques and testing methods for an organic solid</p>	<p>of making and testing the liquid safely</p> <p>A report containing:</p> <ul style="list-style-type: none"> • notes and results from making and testing an organic solid • a description of the principles of preparative methods and tests used • analysis of ways to improve yield and purity and of the reliability of testing methods as a guide to purity • an explanation of the principles behind the industrial manufacture and solid • an observation report by teacher of making and testing the solid safely. 	<p>RV: distillation from GCSE, reflux from B</p> <p>NS: Use of a separating funnel</p>	<p>Informed:</p> <p>C.P5 Correctly prepare and test the purity of an organic solids and draw conclusions.</p> <p>C.P6 Describe the industrial manufacture and testing of an organic solid.</p> <p>Mature:</p> <p>C.M4 Demonstrate skilful application of techniques in preparing and testing the purity of an organic solid and draw detailed conclusions.</p> <p>C.M5 Compare the laboratory and industrial manufacture and testing of an organic solid.</p> <p>C.D3 Analyse the factors affecting the yield and purity of an organic solid in the laboratory and their relevance to its industrial manufacture.</p>	<p>Visit from the RSC spectroscopy in a suitcase workshop</p>	<p>GCSE skills of following a method will be used however this is an A level practical where they will not have learnt the practical skills yet. A revisit of practical skills from assignment B will help students.</p>
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Term 2B Unit 12	<p>A: Investigate different types of diseases and infections that can affect humans</p>	<p>Having researched a variety of infectious and non-infectious diseases, learners could produce case studies relating to their chosen diseases. The case studies would detail the cause and the effect the disease can have on body systems over time. The effect on the quality of life of the individual suffering from the disease must also be evaluated.</p>	<p>RV: From GCSE knowledge of infectious and non-infectious diseases</p> <p>NS: More detail for life cycles will be taught</p> <p>R: Evaluation</p>	<p>Informed:</p> <p>A.P1 Explain the characteristics of the five main types of pathogens and a disease caused by each.</p> <p>A.P2 Explain the causes of non-infectious diseases in humans.</p> <p>Mature:</p> <p>A.M1 Assess the effect of a named infectious and non-infectious disease on body systems</p> <p>A.D1 Analyse how an infectious and a non-infectious disease will progress over time, and the effects this may have on affected individuals.</p>	<p>Sp 1-4 Mo 1-4 So 1-3 Cu 3-4 BV 4-5</p>	<p>Students at GCSE will have heard of each of the 5 pathogens but not studied them in detail so extra information will be given during the teaching.</p>
	<p>B: Examine the transmission of infectious diseases and how this can be prevented</p>	<p>In addition to research work, practical work and simulations should be used to ensure that learners are familiar with the methods by which infectious diseases can be transmitted. Prevention of transmission at a</p>	<p>R: Explaining transmitting</p> <p>NS: simulations of methods of transmitting infections</p>	<p>Informed:</p> <p>B.P3 Explain how infectious diseases can be transmitted.</p> <p>Mature:</p> <p>B.M2 Assess how infectious diseases can be prevented from spreading.</p> <p>B.D2 Evaluate the role of organisations in limiting the spread of infectious diseases.</p>	<p>Sp 1-4 Mo 1-4 So 1-3 Cu 3-4 BV 1-5</p> <p>Linking to current news events such as Ebola,</p>	<p>Transmission has been covered at GCSE however not in as much detail so this will be recapped and explained more</p>

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		personal level and by organisations must be researched. A report or information leaflet can be produced as evidence.			coronavirus etc.	
Term 3	C: Understand how infectious diseases can be treated and managed D: Understand how the human body responds to diseases and infections	Research will need to be undertaken on the different methods of treating diseases. The mode of action of the treatments will need to be analysed. The accessibility or appropriateness of treatments for some people will be evaluated and reported. Information leaflets detailing and comparing the components of the two defence mechanisms and their mode of action could be produced.	NS: information on how to treat different diseases R: analysis of treatments	Informed: C.P4 Describe the method available to treat a type of infectious disease. Mature: C.M3 Analyse different treatment methods to combat disease process. C.D3 Evaluate why treatments may not always be accessible, or appropriate, for particular individuals. Informed: D.P5 Explain the components of the specific and the non-specific defences, in protecting the body. Mature: D.M4 Compare the roles of the specific and non-specific defence mechanisms in the human body.	Use of case studies of current outbreaks to link to current news Sp 1-4 Mo 1-4 So 1-3 Cu 3-4 BV 4-5 Sp 1-4 Mo 1-4 So 1-3 Cu 3-4 BV 4-5	At GCSE treatment of diseases is only covered as antibiotics so a lot of this is new content. At GCSE science and KS3 they will have covered ways in which the body protects itself from infection however these will not be in enough detail so will be revisited

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				D.D4 Evaluate the roles of the cell-mediated and humoral responses to pathogens.		and covered in greater depth.
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Year 13						
When	WHAT & WHY WILL THEY LEARN?		New Skill = NS Revisit = R Revision = RV	Stretch and Challenge (Differentiation – how will you stretch the most able to achieve top grades?)	CIEAG/ Extension Enrichment	KS4 PRIOR LEARNING
Term Plan	<u>KNOWLEDGE & SKILLS</u>	Assessment Objective		Band 5 = Informed Band 6 = Mature	Trips, workshops, speakers, local environment and experiences	
	<u>Transition Task</u> <u>Complete any improvements needed to coursework units</u>	Increase overall unit grades	RV: Coursework	Dependant on students and units (4 or 12)		
Term 1 Students will be entered for Unit 5 exam in JAN even though teaching is	B1: The cardiovascular system	<ul style="list-style-type: none"> Understand the structure and function of the heart Understand the characteristic features of blood 	NS: New content A-level biology content RV: Some GCSE content,	Unit 5 exam: Informed: AO1 Demonstrate knowledge of scientific facts, terms, definitions and scientific formulae Command words: describe, draw, explain, identify, name,	Sp2, Sp4 Mo1, Mo2, Mo4 So1 Cu 3-4 BV 3	CVD is common content at GCSE with trilogy and triple specs of all exam boards, this will be retaught

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<p>not finished as a confidence boost Unit 5 exam content: Biology Chemistry Physics Coursework</p>	<p>B2: Ventilation and gas exchange in the lungs</p>	<p>vessels and pressure changes</p> <ul style="list-style-type: none"> • Understand the cardiac cycle • Understand the use of electrocardiograms (ECG) • Understand how factors can increase the risk of cardiovascular disease (CVD) • Investigate the effect of caffeine on heart rate in Daphnia. • Understand the benefits and risks of treatments for CVD <ul style="list-style-type: none"> • Understand the structure of the human lung and overall ventilation system • Understand the mechanics of ventilation of the lungs 	<p>some content from unit 1</p>	<p>state Marks: ranges from 18 to 24 marks</p> <p>AO2 Demonstrate understanding of scientific concepts, procedures, processes and techniques and their application Command words: calculate, describe, draw, explain, give, show, state Marks: ranges from 51 to 60 marks</p> <p>Learners will be able to recall, select and apply scientific knowledge and understanding to vocational and realistic situations. They will be able to use scientific terminology and concepts in given situations, and use given information and apply appropriate mathematical and technical skills in context. Learners will be able to interpret and analyse information in order to make valid judgements.</p> <p>Mature: AO3 Analyse, interpret and evaluate scientific information to make judgements and reach conclusions Command words: analyse, comment, describe, explain, give, state Marks: ranges from 18 to 24 marks</p> <p>AO4 Make connections, use and integrate different scientific concepts, procedures, processes or techniques</p>	<p>with extra A-level knowledge.</p> <p>Minimal links with GCSE content however building on year 12 content in the exam units</p>
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		<ul style="list-style-type: none"> • Understand the principles that relate to efficient gas exchange in the human lung • Understand the importance of spirometer readings of lung volumes • Understand the importance of the methods used to measure lung function for respiratory conditions • Understand the effects of exercise on the following using data from spirometer traces 		<p>Command words: calculate, comment, explain Marks: ranges from 12 to 15 marks</p> <p>Learners will be able to integrate relevant scientific knowledge and understanding from different areas to demonstrate a deeper understanding of how these apply to vocational and realistic situations. They will be able to use scientific terminology and concepts, communicating consistently and effectively in given situations. They will be able to select relevant information and apply appropriate mathematical and technical skills to justify decisions or solve problems in context. Learners will be able to interpret and analyse information in order to make valid judgements that are supported by evidence, with awareness of limitations.</p>		
	A1: Relating properties to uses and production of substances	<ul style="list-style-type: none"> • Understand the chemical properties of substances • Understand the uses of substances 	NS: New content A-level chemistry content		Sp 2 Mo3,4 So1,3 Cu3-4 BV 2	Minimal links with GCSE content however building on year 12 content in the exam units

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	<p>A2: Structures, reactions and properties of commercially important organic compounds</p>	<ul style="list-style-type: none"> • Understand purification, extraction and manufacture • Understand how to relate the properties of substances to their production and uses • Understand naming, formula, structural representations, bonding, hybridisation, mechanism, radicals, additions 	<p>R: properties relating to bonding</p> <p>RV: Some GCSE content, some content from unit 1</p>			
	<p>C1: Thermal physics in domestic and industrial applications</p>	<ul style="list-style-type: none"> • Be able to use the power, energy, temperature and pressure quantities and units • Know the work done definitions • Be able to calculate efficiency • Understand concepts of thermodynamics 	<p>NS: New content A-level physics content</p> <p>RV: Some GCSE content, some content from unit 1</p>		<p>Sp 2 Mo3,4 So1,3 Cu3-4 BV 2</p>	<p>Minimal links with GCSE content however building on year 12 content in the exam units</p>

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	C2: Materials in domestic and industrial applications	<p>Understand the changes of state of substances used in domestic and industrial processes</p> <ul style="list-style-type: none"> • Understand concepts of material science and apply them in domestic and industrial applications 				
	A Undertake a literature search and review to produce an investigative project proposal	Present a project plan proposal supported by a logbook.	NS: literature review, biased information, scientific journals	<p>Unit 6: Informed:</p> <p>A.P1 Carry out a literature search and review into a chosen scientific area. A.P2 Produce an appropriate project proposal for an investigative project proposal, to include hypothesis.</p> <p>Mature:</p> <p>A.M1 Analyse a literature search and discuss its relevance to inform the investigative project proposal. A.M2 Produce a project proposal for a scientific investigation, to include hypothesis and potential limitations. A.D1 Evaluate the different methods of investigation considered for the investigative project proposal, justifying the hypothesis chosen.</p>	Sp1-5 Mo 1-4 So 1-3 Cu 1,3,4 BV 3-5	
<p>Term 2 Four contents running at the same time by four teachers</p> <p>Unit 5 exam content:</p> <p>Biology</p> <p>Chemistry</p> <p>Physics</p>	B3: Urinary system structure and function	<ul style="list-style-type: none"> • Understand the roles of the kidney • Know the function of the urinary system • Understand the structure and function of a kidney nephron • Understand how the kidney is involved in water, electrolyte 	<p>NS: New content A-level biology content</p> <p>RV: Some GCSE content, some content from unit 1</p>		Sp 2 Mo3,4 So1,3 Cu3-4 BV 2	Minimal links with GCSE content however building on year 12 content in the exam units

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Coursework	B4: Cell transport mechanisms	<p>and acid base balances.</p> <ul style="list-style-type: none"> • Understand how to treat kidney disease • Understand the structure of the cell surface membrane with reference to the fluid mosaic model. • Understand the methods used to transport molecules through cell membranes • Understand how surface area to volume ratio affects transport of molecules in living organisms 			
	A3: Energy changes in industry	<ul style="list-style-type: none"> • Understand enthalpy changes, standard conditions, reaction profiles, measurement of enthalpy changes, calculate enthalpy changes 	NS: New content A-level chemistry content		<p>Sp 2 Mo3,4 So1,3 Cu3-4 BV 2</p> <p>Minimal links with GCSE content however building on year 12 content in the exam units</p>

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	<p>C3: Fluids in motion</p>	<p>Understand the following concepts and apply them in industrial and domestic situations:</p> <ul style="list-style-type: none"> • fluid flow patterns, streamline and turbulent flow • viscosity • viscous drag • mass of fluid flow per second for all points along a pipe or stream tube is constant • non-Newtonian fluid flow • rate of fluid flow and pressure • Bernoulli's principle. 	<p>NS: New content A-level physics content</p> <p>RV: Some GCSE content, some content from unit 1</p>		<p>Sp 2 Mo3,4 So1,3 Cu3-4 BV 2</p>	<p>Minimal links with GCSE content however building on year 12 content in the exam units</p>
	<p>Unit 6 B Produce a plan for an investigative project based on the proposal</p>	<p>Present a project plan proposal supported by a logbook.</p>	<p>R: Planning a project</p>	<p>Unit 6: Informed: B.P3 Produce a realistic working plan for the project, including health and safety and risk assessments. B.M3 Produce a realistic working plan for the project, including health and safety and risk assessments and contingency planning. B.D2 Analyse the effectiveness of the working plan, justifying changes made.</p>		<p>GCSE scientific practical skills however more of that is learnt in unit 3</p>

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<p>Term 3 (half left)</p>	<p>Biology, Chemistry, Physics revision for JUNE exams will take place</p>	<p>Finishing off content not currently taught and then revising weak areas based on mock papers and end of unit tests (ZIGZAG tests)</p>	<p>RV: whole years content based on weak areas in mocks and teaching</p>			
	<p>Unit 6 C Safely undertake the project, collecting, analysing and presenting the results</p> <p>D Review the investigative project using correct scientific principles</p>	<p>Present an evaluative report of the final project outcomes. Outcomes could then be presented to a class and observation sheets could also be used to assess element of self-reflection. Alternatively, this could be an additional written piece alongside the report.</p>	<p>R: skills such as evaluating and presenting</p>	<p>Unit 6: Informed: C.P4 Demonstrate practical skills to assemble relevant apparatus/equipment and materials, and carry out the project using safe working practices. C.P5 Accurately collect, analyse and present the results obtained. D.P6 Produce a report using findings, scientific terminology and protocol appropriately and drawing conclusions. D.P7 Summarise skills developed in the investigative project undertaken. Mature: C.M4 Justify the choice of experimental and data analysis techniques used as a means of increasing accuracy, reliability and validity. D.M5 Produce a report using findings, correct scientific terminology, protocol and formatting and drawing valid conclusions.</p>	<p>Sp1-5 Mo 1-4 So 1-3 Cu 1,3,4 BV 3-5</p>	<p>GCSE scientific practical skills however more of that is learnt in unit 3</p>

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				<p>D.M6 Discuss the importance of skills developed in the investigative project undertaken to achieve aims.</p> <p>CD.D3Evaluate the conclusions of the investigative project and its practical aspects, discussing limitations, improvements and recommendations for further study.</p> <p>CD.D4Evaluate the skills developed in the investigative project undertaken and suggest areas for improvement.</p>		
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