







## Curriculum overview

Subject	Applied Science	Year group	13
<b>Vision statement:</b>	<p>At Landau Forte our curriculum exists to ensure all students regardless of background and ability have the opportunity to unlock their potential. We are committed to students being challenged from their previous key stage learning experiences. Our broad and balanced curriculum is ambitious, coherently planned and sequenced, and will provide the platform for preparing students with the foundations for examination success.</p> <p>Our Curriculum Intent has been informed by a wide variety of researchers and is steeped in evidence based research. Christine Counsell summarises the aspiration of our curriculum to empower all learners creating a pathway to success in university, their career and life:</p> <p><i>'A curriculum exists to change the pupil, to give the pupil new power. One acid test for a curriculum is whether it enables even lower attaining or disadvantaged pupils to clamber into the discourse and practices of educated people, so that they gain powers of the powerful.'</i></p> <p>As well as excellent academic success we aim to ensure our students leave us as polite and well-rounded young adults. Our new core values of Compassion, Courage and Curiosity are currently being embedded throughout our curriculum offer to ensure we continue to meet our social, emotional, spiritual and moral obligations.</p>		
<b>Curriculum intent:</b>	<p><i>Must include school values (3Cs)</i></p> <p><i>In line with the Academy's vision to enhance students' understanding of the world by ensuring an educational journey guided with care and compassion the Science department at Landau Forte Academy QEMS aim to deliver a curriculum that not only develops students' knowledge and understanding of the subject but inspires them to succeed far beyond their education at the academy.</i></p> <p><i>The science curriculum aims to be;</i></p> <ul style="list-style-type: none"> <li>○ <i>Aspirational</i></li> <li>○ <i>Ambitious</i></li> <li>○ <i>Coherent both in planning and sequence</i></li> <li>○ <i>Adapted successfully to suit all needs and abilities</i></li> <li>○ <i>Broad - covering not only aspects of the subject but how this can be taken into the outside world</i></li> </ul> <p><i>In delivering the knowledge based curriculum students will be able to not only achieve the best they can academically but also link theory to reason, understand why they learn about specific concepts, grasp how this fits into the world of careers and ultimately develop the skills and reasoning needed to become well rounded individuals. The curriculum aims to give students a range of opportunities within the classroom and beyond allowing them to become confident and articulate in their scientific ideas. Consistently high expectations of both students and teaching staff ensures that every individual in Science has access to the highest quality of teaching and learning possible and working with key stakeholders ensures that our students have every opportunity to achieve.</i></p> <p><i>In summary the Science curriculum is developed and tailored for each specific year group taking into account the demographic of our students. The intention of which is to allow students to think deeper and use knowledge based skills within their learning both in science and throughout their lives</i></p>		
<b>Threshold Concepts (TCs):</b>	<p><b><u>Unit 2 Practical Scientific Procedures and Techniques</u></b></p> <p>A: Undertake titration and colourimetry to determine the concentration of solutions</p> <p>B: Undertake calorimetry to study cooling curves</p> <p>C: Undertake chromatographic techniques to identify components in mixtures</p>		

	<p>D: Review personal development of scientific skills for laboratory work</p> <p><b>Unit 12: Diseases and Infection</b></p> <p>Investigate different types of diseases and infections that can affect humans</p> <p>Examine the transmission of infectious diseases and how this can be prevented</p> <p>Understand how infectious diseases can be treated and managed</p> <p>Understand how the human body responds to diseases and infections.</p>					
<b>KS4 specification summary:</b>	<p>The KS4 science curriculum ensure students have the knowledge to enable them to develop curiosity about the natural world, insight into working scientifically, and appreciation of the relevance of science to their everyday lives. This allows students to not only develop scientific knowledge and conceptual understanding through the specific disciplines of biology but also develop understanding of the nature, processes and methods of science, through different types of scientific enquiry that help them to answer scientific questions about the world around them.</p>					
<b>Learner skills:</b>	<p>Critical thinking</p>  <p>CRITICAL THINKING</p>	<p>Organisation</p>  <p>ORGANISATION</p>	<p>Collaboration</p>  <p>COLLABORATION</p>	<p>Adaptability</p>  <p>ADAPTABILITY</p>	<p>Oracy</p>  <p>ORACY</p>	<p>Self-quizzing</p>  <p>SELF QUIZZING</p>
	Term 1 Aug-Oct	Term 2 Nov-Dec	Term 3 Jan-Feb	Term 4 Mar-Apr	Term 5 Apr-May	Term 6 Jun-Jul
<b>The Big Question</b>	<p>Unit 2: How can I apply the science I have learnt?</p> <p>Unit 12: What are the causes of disease and how are the prevented and treated?</p>					
<b>Big picture questions:</b>	<p>What is a valid experimental plan?</p> <p>How to process scientific data?</p> <p>How to interpret scientific data?</p> <p>How to evaluate a scientific method?</p>	<p>What is a valid experimental plan?</p> <p>How to process scientific data?</p> <p>How to interpret scientific data?</p> <p>How to evaluate a scientific method?</p>	<p>What is a valid experimental plan?</p> <p>How to process scientific data?</p> <p>How to interpret scientific data?</p> <p>How to evaluate a scientific method?</p>	<p>How are infectious diseases spread?</p> <p>How can infectious diseases be prevented from spreading?</p> <p>What is the role of organisations in preventing the spread of diseases?</p>	<p>How are infectious diseases spread?</p> <p>How can infectious diseases be prevented from spreading?</p> <p>What is the role of organisations in preventing the spread of diseases?</p>	<p>How are infectious diseases spread?</p> <p>How can infectious diseases be prevented from spreading?</p> <p>What is the role of organisations in preventing the spread of diseases?</p>

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			<p>What are the different types of pathogens?</p> <p>What are the causes of non-infectious diseases?</p> <p>What are the effects of infectious and non-infectious diseases on the body?</p>	<p>What methods can be used to treat infectious diseases?</p> <p>What is the role of the specific and non-specific immune responses?</p> <p>What are the advantage of the specific and non-specific immune responses?</p>	<p>What methods can be used to treat infectious diseases?</p> <p>What is the role of the specific and non-specific immune responses?</p> <p>What are the advantage of the specific and non-specific immune responses?</p>	<p>What methods can be used to treat infectious diseases?</p> <p>What is the role of the specific and non-specific immune responses?</p> <p>What are the advantage of the specific and non-specific immune responses?</p>
<p><b>Content (Linked to TCs):</b></p>	<p>Unit 2: Assignment A:</p> <ul style="list-style-type: none"> <li>Undertake titration and colorimetry to determine the concentration of solutions</li> <li>Use of pH meters and probe</li> <li>Use of balances and weighing</li> <li>Safe use of volumetric glassware</li> <li>Accurate determination of the end-point of titrations</li> <li>Selection and use of a colorimeter or visible spectrometer</li> </ul> <p>Assignment D: Review personal development of scientific skills for laboratory work</p>	<p>Unit 2: Assignment B:</p> <ul style="list-style-type: none"> <li>Undertake calorimetry to study cooling curves</li> <li>Explain the relationship between temperature and heat energy.</li> <li>Utilise types of thermometer and how they are used to gain accurate readings</li> <li>Identify rate of cooling from the gradient of the tangent to the cooling curve.</li> <li>Determination of melting point from the shape of a curve for a substance freezing.</li> </ul>	<p>Unit 2: Assignment C:</p> <ul style="list-style-type: none"> <li>Undertake chromatographic techniques to identify components in mixtures</li> <li>Principles of paper chromatography.</li> <li>Principles of thin-layer chromatography (TLC)</li> <li>Use of capillary tubes to apply mixtures to paper or TLC plates.</li> <li>Choice of developing solvent and vessel.</li> <li>Preparative methods for samples</li> <li>Separation of components of a mixture, to include plant pigments extracted from</li> </ul>	<p>Unit 12: Assignment A:</p> <ul style="list-style-type: none"> <li>Analyse how an infectious and a non-infectious disease will progress over time, and the effects this may have on affected individuals.</li> <li>Assess the effect of a named infectious and non-infectious disease on body systems.</li> <li>Explain the characteristics of the five main types of pathogens and a disease caused by each.</li> <li>Explain the causes of non-infectious diseases in humans.</li> </ul> <p>Assignment B:</p> <ul style="list-style-type: none"> <li>Evaluate the role of organisations in</li> </ul>	<p>Assignment C:</p> <ul style="list-style-type: none"> <li>Evaluate why treatments may not always be accessible, or appropriate, for particular individuals.</li> <li>Analyse different treatment methods to combat disease process.</li> <li>Describe the method available to treat a type of infectious disease.</li> </ul> <p>Assignment D:</p> <ul style="list-style-type: none"> <li>Evaluate the roles of the cell-mediated and humoral responses to pathogens.</li> <li>Compare the roles of the specific and non-specific defence</li> </ul>	

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		Assignment D: Review personal development of scientific skills for laboratory work	leaves/herbs with propanone.  Assignment D: Review personal development of scientific skills for laboratory work	limiting the spread of infectious disease. <ul style="list-style-type: none"> <li>Assess how infectious diseases can be prevented from spreading.</li> <li>Explain how infectious diseases can be transmitted.</li> </ul>	mechanisms in the human body. <ul style="list-style-type: none"> <li>Explain the components of the specific and the non-specific defences, in protecting the body</li> </ul>	
<b>Key vocabulary:</b>	Titration Acid Base Standard solution Indicator Colorimeter Concentration pH volumetric	Cooling curve Thermometer Gradient Tangent Melting point Pure Impure Calorimetry	Chromatography Thin layer chromatography Solvent Capillary Rf value Stationary phase Mobile phase	Cells B cells non-specific immunity antiretroviral physical barriers chemical barriers phagocytosis pathogen communicable non communicable	Cell mediated Humoral Infection Disease Mechanism	
<b>Assessment:</b>	Completed assignment	Completed assignment	Completed assignment	Completed assignment	Completed assignment	
<b>Key/Historical misconceptions in this unit:</b>	The difference between the independent and dependent variable.  The difference between the terms valid and reliable.	Mixtures have a set melting point  All substances are pure	All substances are soluble	A virus is a living structure – Viruses are non-living structures.  All bacteria are pathogens - Most bacteria are harmless and, in fact, we would not survive without them. Bacteria help us digest food, produce vitamins	A virus is a living structure – Viruses are non-living structures.  All bacteria are pathogens - Most bacteria are harmless and, in fact, we would not survive without them. Bacteria help us digest food, produce vitamins	A virus is a living structure – Viruses are non-living structures.  All bacteria are pathogens - Most bacteria are harmless and, in fact, we would not survive without them. Bacteria help us digest food, produce vitamins
<b>Sequencing:</b>	After completing Unit 1: scientific principles and Unit 3: Practical assessment students have a secure understanding of both scientific concepts and experimental practice. Starting with Unit 2 in year 13 allows students to utilise their skills and knowledge in their assignments whilst at the same time developing their independent writing skills. The decision to undertake unit 12 allows students to research and complete tasks based on disease – with students having real life knowledge following the pandemic they can draw on this within their assignments making it relevant to real life. Alongside unit 12 there may be re-teaching of units 1 and 3 for any potential external examinations needed.					



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