



CURIOSITY

COMPASSION

COURAGE



## Curriculum overview

Subject	Science	Year group	9
<p><b>Vision statement:</b></p>	<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>		
<p><b>Curriculum intent:</b></p>	<p>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.</p> <p>The science curriculum aims to be;</p> <ul style="list-style-type: none"> <li>○ Aspirational</li> <li>○ Ambitious</li> <li>○ Coherent both in planning and sequence</li> <li>○ Adapted successfully to suit all needs and abilities</li> <li>○ Broad - covering not only aspects of the subject but how this can be taken into the outside world</li> </ul> <p>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.</p> <p>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.</p>		



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### Threshold Concepts (TCs):

#### *Biology*

1. *Cells, Genetics, Inheritance and Modification*
2. *Health, Disease and the Development of Medicine*
3. *Human Biology*

#### *Chemistry*

1. *Atoms, Compounds and States of Matter*
2. *Acids and Metals*
3. *Elements and Chemical reactions*

#### *Physics*

1. *Forces, Movement and Energy*
2. *Waves and Radiation*
3. *Electricity and Magnets*

### KS2 National Curriculum summary:

The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.

Pupils should read, spell and pronounce scientific vocabulary correctly.

#### **Working scientifically**

During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- using test results to make predictions to set up further comparative and fair tests
- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations



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• identifying scientific evidence that has been used to support or refute ideas or arguments

**Topics covered:**  
 Animals Including Humans, Everyday Materials (Properties and Changes of Materials), Living Things and their Habitats, Light, Forces and Magnets, Electricity, Earth and Space, Evolution.

<b>Learner skills:</b>	Critical thinking	Organisation	Collaboration	Adaptability	Oracy	Self-quizzing
	 CRITICAL THINKING	 ORGANISATION	 COLLABORATION	 ADAPTABILITY	 ORACY	 SELF QUIZZING

	Term 1 Aug-Oct	Term 2 Nov-Dec	Term 3 Jan-Feb	Term 4 Mar-Apr	Term 5 Apr-May	Term 6 Jun-Jul
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**The Big Question** **How does science affect my life?**

<b>Big picture questions:</b>	How do compounds form? Are all cells the same?	What is motion? Are all salts sodium chloride?	How do you 'catch' diseases?	What is the link between sunburn and skin cancer? Do all elements react in the same way?	How does electricity get to my house?	How does my body know what to do?
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<b>Content (Linked to TCs):</b>	C1: Atoms, Compounds and States of Matter <ul style="list-style-type: none"> <li>States of matter</li> <li>Atomic structure</li> <li>Periodic table</li> <li>Metals and the periodic table</li> <li>Ionic bonding</li> <li>Covalent bonding</li> </ul>	P1: Forces, Movement and Energy <ul style="list-style-type: none"> <li>Balanced and unbalanced Forces</li> <li>Measuring quantities</li> <li>Distance/speed time graphs</li> </ul>	B2: Health, Disease and the Development of Medicine <ul style="list-style-type: none"> <li>Health and Disease</li> <li>Lifestyle diseases</li> <li>Pathogens</li> <li>Spread and control of pathogens</li> </ul>	P2 Waves and Radiation: <ul style="list-style-type: none"> <li>Describing waves</li> <li>Wave speed</li> <li>EM waves</li> <li>Inside atoms</li> <li>Radioactive decay</li> <li>Half life</li> <li>Dangers of radiation</li> </ul>	P3: Electricity and Magnets: <ul style="list-style-type: none"> <li>Circuits</li> <li>Resistance</li> <li>Components and Resistance</li> <li>Power</li> <li>Magnets</li> <li>Electricity in the home</li> </ul>	B4: Human Biology <ul style="list-style-type: none"> <li>Hormones</li> <li>Homeostasis</li> <li>Enzymes</li> <li>Exchange and Transport</li> <li>Circulatory System</li> <li>Respiration</li> </ul>
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	<ul style="list-style-type: none"> <li>• Metallic bonding</li> </ul> <p>B1: Cells, genetics, inheritance and modification</p> <ul style="list-style-type: none"> <li>• Cell structure</li> <li>• Specialised cells</li> <li>• The nervous system</li> <li>• DNA</li> <li>• Inheritance</li> <li>• Variation</li> <li>• Evolution and Natural Selection</li> </ul>	<ul style="list-style-type: none"> <li>• Calculating speed and acceleration</li> <li>• Mass, weight and acceleration</li> <li>• Energy transfers</li> <li>• Wasted energy</li> </ul> <p>C3: Acids and Metals</p> <ul style="list-style-type: none"> <li>• Acids and metals</li> <li>• Neutralisation</li> <li>• Making salts</li> <li>• Extracting metals</li> <li>• </li> </ul>	<ul style="list-style-type: none"> <li>• Protection against infection</li> </ul>	<p>C4: Elements and Chemical reactions</p> <ul style="list-style-type: none"> <li>• Group 1</li> <li>• Group 7</li> <li>• Group 0</li> <li>• Energy Changes</li> <li>• Measuring Rates of Reaction</li> </ul>		
<b>Vocabulary Instruction:</b>	Ionic Covalent Stem Cell Differentiation Force Acceleration	Reactivity series Neutralisation	Pathogen Infection immunity	Transverse Longitudinal Amplitude Frequency Half life Radiation Reactivity Group Period	Circuit Series Parallel Resistance Component Power Magnet Pole National grid Earth	Hormone Endocrine gland Endocrine system Homeostasis Enzyme Diffusion Active transport Osmosis Respiration
<b>Assessment:</b>	Key learning tasks for all topics	Key learning tasks for all topics	Key learning tasks for all topics	Key learning tasks for all topics	Key learning tasks for all topics	Key learning tasks for all topics
<b>Key/Historical misconceptions in this unit:</b>	Chemistry Misconceptions: Differences between	Physics Misconceptions: Balanced forces	Biology Misconceptions: Transmission of diseases (communicable and non communicable diseases)	Physics Misconceptions: The difference between transverse and longitudinal waves	Physics Misconception: The difference between current, potential	Biology Misconceptions: Hormones, where they are released from and the effect they have on organs



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	ionic and covalent bonding  Biology Misconceptions: Stem cell differentiation to result in specialised cells	Chemistry Misconceptions: All salts are sodium chloride		C4 Misconceptions: Trends in reactivity of the group 1, 7 and 0 elements	difference and resistance	
<b>Sequencing:</b>	We have chosen to sequence the year 9 curriculum like this because it builds a link in knowledge between year 7/8 fundamentals and the wider concepts needed to succeed within science. It enables students to study concepts to a deeper level of understanding to focus on those key concepts that are of most benefit.					
<b>Values</b>	<p><b>This scheme of work promotes the school values of Compassion, Curiosity and Courage by:</b></p> <p><b>Compassion – Acceptance of differing scientific models. Support of peers during feedback process'</b></p> <p><b>Curiosity – Asking scientific questions and focus on scientific investigations</b></p> <p><b>Courage – Review of prior learning and acting on feedback to bridge gaps within knowledge</b></p>					
<b>National Curriculum plus:</b>	In addition to teaching the statutory elements of the national curriculum, we also include careers based investigations with every topic to promote science aspirations within the year 9 cohort. Students are given insight into careers relevant to the demographic and local area to allow them to see the wider uses of science, avoiding the misconception of it's only for Doctors, nurses and vets.					