

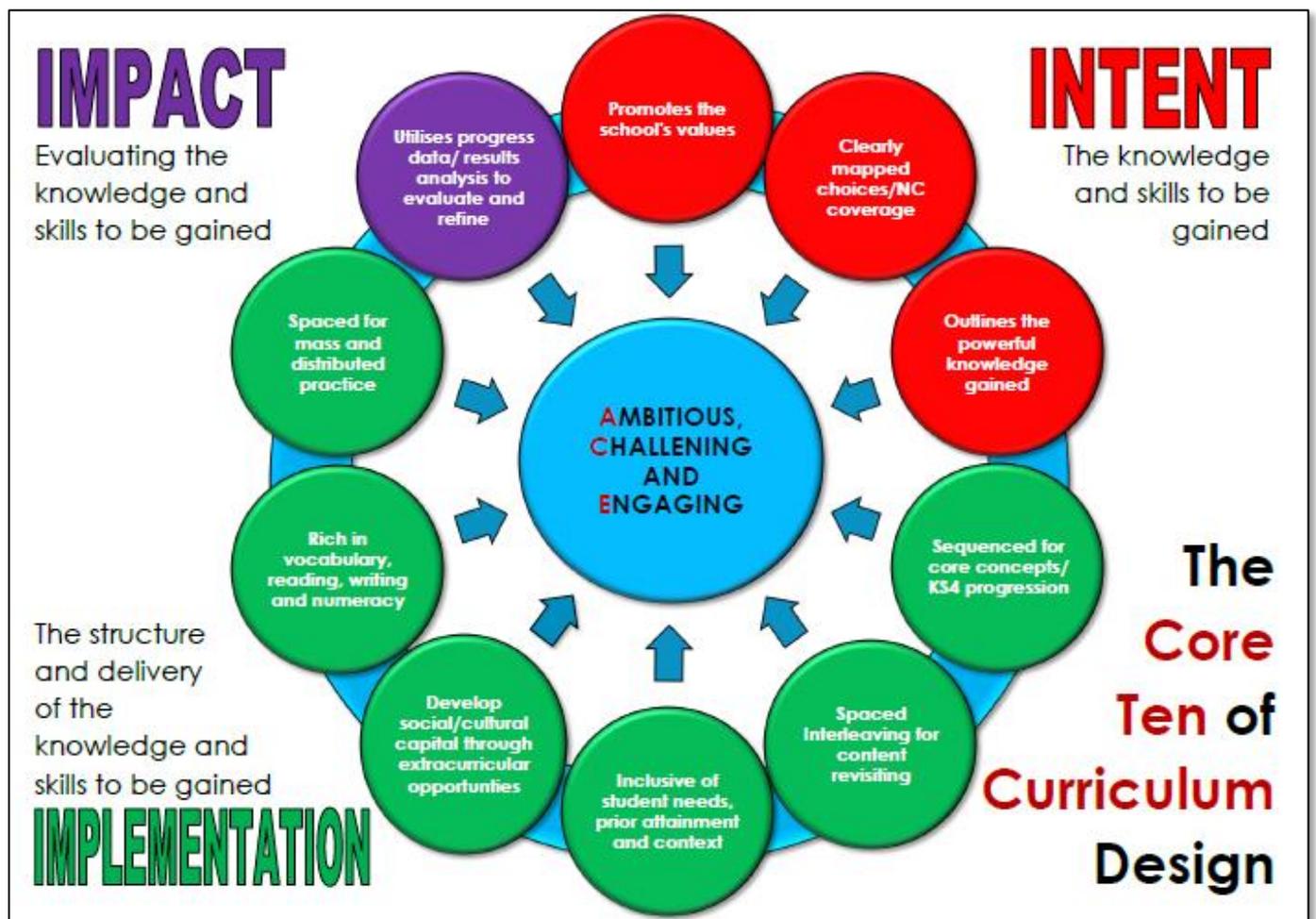
1. CURRICULUM INTENT OVERVIEW PLAN Key Stage 4

Subject: GCSE Computer Science

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THINKING PROCESS - CURRICULUM INTENT OVERVIEW PLAN (KS4)

Intent Statement – at Landau Forte Amington, we believe learning powerful knowledge helps students achieve and creates a fairer society.

How are you trying to accomplish this, with this Programme of Study (PoS)?

DEFINITION: Powerful Knowledge is described as knowledge which enriches students' lives and creates a fairer society by providing students with intellectual power. It is knowledge which support students in engaging with the world and communicating with people regardless of background or social standing.

Computer science at Landau aims to equip pupils to use computational thinking and creativity to understand and change the world. Pupils are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content.

Aims – what do you want pupils to be able to know and do by the time they finish this Programme of Study (PoS)?

The aims for computer science at Landau Forte are to ensure that all pupils:

- Have strong academic results that allows them to pursue careers in computer science or others fields where the skills learned are able to set them apart from other candidates.
- Can understand and apply the fundamental principles and concepts of abstraction, logic, algorithms and data representation.
- Pupils can use the knowledge they have acquired to write code in the Python computing language order to solve such problems and use the transferrable / fundamental skills / concepts needed to be able to code in any computing language.
- Can analyse complex real world problems in computational terms, by applying knowledge using familiar, unfamiliar or new technologies,
- Leave the Academy as responsible, competent, confident and creative users of information and communication technology.
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Academy Values – at Landau Forte Amington, we want students to be ambitious, brave and kind. How are these values promoted in this PoS?

Ambitious:

The course aims to create the next generation of computer scientists that are able to solve complex real world problems in any computer language by applying the key concepts and skills they have gained. The course is delivered with a high level of challenge to engage the most able of pupils. To develop the problem solving skills that will allow pupils to code in any language by applying the principled that have been learnt.

Brave:

Learners are challenged to use a programming language to meet user requirements and step out of their comfort zone by developing skills that they may need in later life.

Kind:

The course is encourages pupils to consider the needs of other and consider the legal, social, environmental and ethical aspects of ICT and supporting technology usage.

**KS4 Specification Choices – what topics are taught and does it ensure breadth and depth, as well as meet the requirements of the exam specification?
 (Please note - the sequencing of topics will be explored in the implementation overview, the main purpose at this stage is to know what is taught)**

YEAR		Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
10	Unit/ Topic	Unit: Fundamentals of algorithms Topics: Decomposition Abstraction Flow Charts Pseudo code	Unit: Programming Topics: Basics of Programming Iteration Repetition Functions Arrays Files Dictionaries Robust Programming	Unit: Data Representation Topics: Number Bases Conversion Units Binary Arithmetic Representing Images Representing Sounds Data Compression	Unit: Computer Systems Topics: Hardware / Software Boolean Logic Systems architecture	Unit: Networks Topics: Wired / Wireless LANS Security Protocols Cyber Security	Unit: Impact of Technology Topics: Ethical Legal Environmental Society Privacy

	Specification/ Assessment Objective	<p>3.1.1 Representing algorithms 3.1.2 Efficiency of algorithms 3.1.3 Searching algorithms 3.1.4 Sorting algorithms</p>	<p>3.2.1 Data types 3.2.2 Programming concepts 3.2.3 Arithmetic operations in a programming language 3.2.4 Relational operations in a programming language 3.2.5 Boolean operations in a programming language 3.2.6 Data structures 3.2.7 Input/output and file handling 3.2.8 String handling operations in a programming language 3.2.9 Random number generation in a programming language 3.2.10 Structured programming and Subroutines (procedures and functions) 3.2.11 Robust and secure programming</p>	<p>3.3.1 Number bases 3.3.2 Converting between number bases 3.3.3 Units of information 3.3.4 Binary arithmetic 3.3.5 Character encoding 3.3.6 Representing images 3.3.7 Representing sound 3.3.8 Data compression</p>	<p>3.4.1 Hardware and software 3.4.2 Boolean logic 3.4.3 Software classification 3.4.4 Classification of languages and translators 3.4.5 Systems architecture</p>	<p>3.5 Fundamentals of computer networks</p>	<p>3.6.1 fundamentals of Cyber security 3.6.2 Cyber security threats 3.6.3 Methods to detect and prevent cyber security threats 3.7 relational databases and structured query language (SQL) 3.7.1 relational databases 3.7.2 SQL 3.8 Ethical, legal and environmental impacts of digital technology on wider society, including issues of privacy</p>
11	Unit/Topic	<p>Programming (NEA) Designing the solution Creating the solution Testing the solution Potential enhancements and refinements</p>	<p>Fundamentals of algorithms / Programming Topics: Revisiting all topics from Year 10</p>	<p>Data Representation / Computer Systems Topics: Revisiting all topics from Year 10</p>	<p>Networks / Impacts of Technology. Topics: Revisiting all topics from Year 10</p>	<p>Revision Topics dependent on knowledge audit / mock exam analysis.</p>	<p>N/A</p>

Specification/ Assessment Objective	Programming skill project (non assessed component) Centre designed programming skills project that assess students ability to: <ul style="list-style-type: none"> • Design • Write • Test • Refine 	Revisiting algorithms / Programming assessment objectives from Year 10	Revisiting Data Representation / Computer Systems assessment objectives from Year 10	Revisiting Networks / Impacts of Technology assessment objectives from Year 10	Assessment objectives dependent on knowledge audit / mock exam analysis.	N/A
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Exam specification content missing from this PoS and why?	Content taught in addition to the exam specification and why?
All elements of exam specification covered.	Careers Talk: Computing at University. To engage pupils and encourage further study. Core Software Skills: Building blocks for main SOW and digital literacy skills.

Powerful Knowledge Choices – what powerful knowledge is included in this PoS? Consider what knowledge is it important for our students to know, so that when they leave school they can engage in and lead discussions, with people from the most advantaged backgrounds? (Please note - the sequencing of topics will be explored in the implementation overview, the main purpose at this stage is to know what powerful knowledge is gained)

YEAR	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
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10	Powerful Knowledge	How to program / Concepts of programming Abstraction and Decomposition.	How to program / Concepts of programming Abstraction and Decomposition.	How data is stored.	Use of the office package. To know the difference between hardware and software and their uses.	To know the properties of different networks and their uses.	How to stay safe online in relation to their age. How to use relational database, how to use SQL to retrieve data efficiently Consider Ethical, Legal, Environmental, Society and Privacy issues
	Why it is important to know	Cultural Capital: Problem solving and splitting up a bigger problem into smaller chunks. Developing a systematic approach to problem solving. Preparation for Employment: Skills gap and sought after skill set from employers.	Cultural Capital: Problem solving and splitting up a bigger problem into smaller chunks. Developing a systematic approach to problem solving. Preparation for Employment: Skills gap and sought after skill set from employers.	Supporting Other Subjects: Supporting maths skills and logical thinking and core maths skills.	Purchasing Decisions. To allow pupils to make informed purchasing decisions in the future based on their requirements. Preparation for Employment: Allows pupils to be computer literate in the Microsoft Office package which is a key component in most forms of employment	Purchasing Decisions. To allow pupils to make informed purchasing decisions in the future based on their requirements.	Safety / Moral Obligation: So pupils stay safe and within the law. Cultural Capital: Data Interpretation looking at bias, source of material. Social Awareness; to be aware of how ICT affects our everyday life's and the moral implications of this
11	Powerful Knowledge	How to program / Concepts of programming Abstraction and Decomposition.	How to program / Concepts of programming Abstraction and Decomposition.	How data is stored.	To know the properties of different networks and their uses.	Dependent on knowledge audit / mock exam analysis. Exam Technique.	N/A

	Why it is important to know	<p>Cultural Capital: Problem solving and splitting up a bigger problem into smaller chunks.</p> <p>Developing a systematic approach to problem solving.</p> <p>Preparation for Employment: Skills gap and sought after skill set from employers.</p>	<p>Cultural Capital: Problem solving and splitting up a bigger problem into smaller chunks.</p> <p>Developing a systematic approach to problem solving.</p> <p>Preparation for Employment: Skills gap and sought after skill set from employers.</p>	<p>Supporting Other Subjects: Supporting maths skills and logical thinking and core maths skills.</p>	<p>Purchasing Decisions. To allow pupils to make informed purchasing decisions in the future based on their requirements.</p>	<p>Dependent on knowledge audit / mock exam analysis.</p> <p>Develop exam skills / techniques needed for lifelong learning.</p>	N/A
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How does the Curriculum Intent meet the ACE curriculum design?

Ambitious	<p>Ambitious: Delivery of challenging concepts and ideas.</p> <p>Can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation</p>
Challenging	<p>Delivery of challenging concepts and ideas.</p> <p>Lessons created at high level of stretch for age group. High level of maths skill is required and used regularly.</p> <p>Can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems</p>
Engaging	<p>Links to careers. Ability to personalise learning in NEA. The course aims to create the next generation of computer scientists by taking abstract theory and ensuring that it is applied to real world problems.</p>

What are the current strengths of the Curriculum Intent?

Recently reviewed and amended. Created in conjunction with MAT partners and NCCE.
 Covers all content required in specification to allow pupils to achieve the best possible outcomes.
 Pitched at high level for most able pupils.

What specific actions have to be taken in response to the above? Please consider:

- KS4 Curriculum content changes;
- Powerful knowledge changes;
- Modifications to ensure an ACE curriculum design;
- CPD for teachers in your subject area;
- Additional research you have to consider as part of this review.

No current need to change the curriculum and powerful knowledge, however this needs to be reviewed annually in conjunction with MAT partners and NCCE.
Consider ways to make content more challenging for HPA pupils for those who are excelling – NCCE training to follow.
CPD for GMA to better understand the marking and moderation process using MAT links.
Create a hub for marking and standardisation of work with MAT or other local schools (NCCE).
Opportunities for extracurricular learning: talks and trips need planning