Department on a page Computing from Sept 22 Subject: Computer Science Staff: KJO

CURRICULUM STATEMENT:

- WE WILL DEVELOP **KNOWLEDGE** AND **UNDERSTANDING OF OUR DIGITAL TECHNICAL WORLD** THROUGH **COMPUTATIONAL THINKING** AND **PROBLEM SOLVING**. WE WILL DEVELOP A CURIOSITY FOR COMPUTER SCIENCE AND CYBER WHILST EMBEDDING **CREATIVITY** AND **RESILIENCE** THROUGH **PRACTICAL METHODS**.

Year 9 Intention	GH Year 9 Core curriculum knowledge covered
Our year 9 curriculum supplies a solid substantive and disciplinary foundation year to KS4 and KS5 study. It lays the foundations for understanding and appreciating the digital world through the specific disciplines of computer science. Digital technology is driving extraordinary global changes that will continue to have a crucial impact on business, industry, and individuals; exploring these changes effectively and safely requires all our learners significant understanding of digital literacy, information technology and computer science. All our learners will be taught the essential aspects of the knowledge, methods, process, and uses across all disciplines of computing. We will encourage our learners to use computational thinking and creativity to understand the digital world in logical and physical contexts. They will be encouraged to understand how computing can be used to solve real world problems, whilst enabling them to think computationally (thinking abstractly, thinking ahead, thinking procedurally, thinking logically, and thinking concurrently), and analyse cause and impact.	In year 9 we cover all the fundamental "big ideas" in substantive computing knowledge, underpinned with the specific development of disciplinary knowledge. We do this to identify and plug any gaps in student prior knowledge and skills, to enable them to springboard into KS4 and beyond. The curriculum is broken down lesson by lesson and disciplinary knowledge and skills are iteratively covered through the year to ensure students are provided with the opportunity to master these concepts as well as develop a broad and balanced subject knowledge to bring into KS4.
KS4 Intention	**Exam (K4) curriculum knowledge covered**
We deliver OCR Computer Science at KS4. We have chosen this specification to provide all students the opportunity to study Computer Science at GCSE and provide them with the qualification needed to progress to post 16 educations. The course studied provide students with the opportunity to increase their subject knowledge as they progress through each module and to make informed choices about their post 16 options. This course dovetails smoothly with the specifications, we teach at KS5. This enables us to continue to spiralise our substantive and disciplinary knowledge from KS3 to KS5 effectively. The curriculum allows students to continue to build up schema, develop a broad understanding of the workings of the digital technical world around them, identify and address misconceptions. Students further develop their computational thinking skills to enable them to be successful in in the practical elements of the course which in turn provides them the necessary skills at KS5. We review our SOL on a rolling ongoing basis, and we work closely with schools in our trust.	Currently we teach computer science in the sequence recommended by the examination board supported the SOL, organised around key technical concepts. In Y10 we teach the practical elements alongside the content studied for paper1 which is further underpinned with theory content in year 11. The content covered at KS4 is organised to take advantage of mutually beneficial curriculum connections, not only within computer science but between other subject areas in college. We are currently reviewing the tasks and challenges of the programming elements of the course, to improve and support students in communication and mathematics.

KS5 Intention	Exam (KS5) Curriculum knowledge covered
We deliver OCR Computer Science and OCR Cambridge Technical Level 3 in IT at KS5. We have chosen these specifications to provide all students the opportunity to study Computer Science at A Level or to study a vocational course at a technical level and provide them with the qualifications needed to progress to higher education or an apprenticeship. The courses studied provides students with the opportunity to further deepen their subject knowledge from GSCE as they progress through each unit and to make informed choices about their post 18 options. This course gives a sound basis of knowledge and skills required in higher education, or an apprenticeship. The curriculum allows students to continue to build up schema, develop a deep and broad understanding of the workings of the digital technical world around them, identify and address misconceptions. Students further develop their computational thinking skills to enable them to be successful in in the practical elements of the course which in turn provides them the necessary skills needed for higher education such as writing personal statements or writing assignments. We review our SOL on a rolling ongoing basis, and we work closely with schools in our trust.	We currently teach computer science in the sequence recommended by the examination board supported by the SOL, organised around key technical concepts. In year 12 we teach the practical elements which gives new students who have not studied GCSE computer science the opportunity to learn in parallel with their peers, learning a programming language of their choice, subject to exam board approval; most students request to learn C# as its industry standard which is used in many software development areas. The content covered at KS5 is organised to take advantage of cross-curricular connections. We are currently reviewing the tasks and challenges of the programming elements of the course, to improve support to students in communication and mathematics.

How and where specifically this subject's curriculum contributes to the 'wider' development of learners?			
Subject Specific Skills	Wider Learning Skills	Personal Attributes support learning	Preparation for Adult Life
We want students to develop skills that enable them to solve problems demonstrating a resilience and in turn confidence in both the practical and theory aspects of computing. Learners will build on communication skills for sophisticated and technical words.	Develop memory and sequential links amongst disciplines and sequences of study in order to see the bigger picture. Develop metacognition through activities that engage, and challenge thinking and tackle complex problems.	Develop collaborative learning through promotion of group work tasks and practical delivery. Build both mathematical and communication skills in order to approach problems, theoretical approaches and formulate solutions.	Link topics to industry through engagement with employer partners to contextual delivery in the classroom and workplace environment, and current technical world issues.
Cultural Capital	Disciplinary Literacy	British Values	Promotes the Equality Objectives
We broaden and enrich the curriculum with trips and visits to GCHQ, Bletchley Park, and computer science departments in educational venues, such as Coventry University, Scarborough, and University of Hull. We run a popular computer science enrichment program where students engage in programming tasks and challenges that cover the breadth of disciplines of Computer Science.	Across all key stages there is a huge emphasis in the use of tier 3 vocabulary. We use the college based "Speak like a scholar" approach to ensure staff and students use tier 3 vocabulary orally. This is then transferred to "Write like a scholar". We work closely with the literacy lead to promote whole school literacy approaches, including "Everyone Reads in Class" and providing students with enrichment text examples. Within our SOL we provide opportunities for students to develop critical thinking of communication, such as analysing and reading code. We also focus on computational literacy, which requires students to design, write, test, and refine programs. Our goal for this is to	Our curriculum supports the 5 British Values. We regularly promote tolerance of different religious beliefs, the rule of law, individual liberty and mutual respect and democracy when discussing subjects such as ethical, legal, cultural, and environmental issues of computing.	Our curriculum promotes a curiosity in computing and promotes that all computer scientists and computing theories are of equal value. Where possible we use examples within teaching that recognise and respect the differences in the development of computing theory and computer scientists. With the aim to reduce and remove inequalities and barriers that already exist to ensure all students understand that anyone can be a computer scientist.

	illustrate the importance and value of direction words and how they impact the outcome of program design.		

Implementing the curriculum:

- The fully mapped curriculum is shared with staff as a google document, staff are encouraged to add and edit this as a working document. We publish a "parent speak" version of this on the school website.
- Each lesson has a lesson plan on the google drive/ one drive and is fully resourced. Staff are encouraged to develop and adapt resources. Students have access to google classroom for each subject where lessons are provided for those who are learning at home and where homework is set/ published.
- Students' complete assessment work in their exercise books. Green pen indicate where a student is responding to feedback. Staff feedback to the student in purple pen. Immediate feedback is also provided by AFL and online quizzes.
- Students' complete classwork electronically and on hardcopy, scaffolded tasks with the emphasis is made on the use of tier 3 vocabulary. Green font indicates where a student is responding to feedback.
- Homework is set weekly online via Bromcom and Google classroom which is monitored by staff on a weekly basis.
- In all years, feedback is also given where a student has achieved a skill – Item, structure, purpose, reason, relation, approach.
- Low stakes assessment occurs throughout each topic in the form of knowledge quizzing, with summative assessment completed a scheduled times throughout the year as determined by the DOS for the academy chain.
- There is an enrichment coding group that encourages enthusiasm for computing and computational thinking. Extra-curricular enrichment is offered through Immersive labs where students competitively complete tasks and challenges for the UTC, building points for every challenge completed which determines a leader board position amongst other schools, colleges, and universities, nationally and globally; we currently hold a position at 324 out of 1065. This is turn provides students with knowledge and skills to prepare for a job application process at GHCQ.
- In addition, students have the opportunity to engage in an international award-winning programme, that help students develop digital, enterprise and employability skills for free. Through a series of online challenges, students can win career-enhancing badges (Bronze, Silver, Gold), unlock new opportunities and, ultimately, gain industry- recognised awards that help them stand out from others.
- We are working closely with University of Coventry to deliver a bespoke cyber short course to support the cyber aspects of the curriculum and to improve our students' practical skills in further platform-based labs; TryHackMe, which gives students the practical knowledge in cyber threats posed to networks, IoT (Internet of Things), and ethical hacking.

Measuring the impact of the curriculum:

- Our curriculum planning document is regularly scrutinised and updated as part of the development of the department. This is done within the department and is supported by the UTC's Director of science. We use hard and soft data gathered from the QA/QI process to structure any changes and monitor impact upon student outcomes.
- Students' progress is tracked across year 9, KS4 and KS5 with a series of standardised assessments that are planned and coordinated. These assessments are pre-moderated, internally marked and then internally and externally moderated. This enables us to have a confident measure of student's current attainment levels and it puts in place targeted and timely interventions where appropriate. The ultimate measure of student's attainment is terminal external exams.
- Skills and the development of computationally thinking is tracked across year 9, KS4 and KS5 through book looks, (Including electronic workbooks), student voice and through QLA of computational inquiry-based questions in assessments.
- We monitor our curriculum depth and coverage through yearly subjects' inquiries, regular learning walks, book looks and student voice. This is done internally as well as externally with the Director of Science and SLT.

- We are confident that our internal assessments are reliable, because of the process outlined above. We build upon the data received to target intervention by conducting QLA on the assessments to identify the substantive and disciplinary knowledge gaps that need to be addressed. The outcomes of these assessments also feed into whole school, individual and class future learning.
- We work closely with the SENDCO, PP lead and 6th form teachers to ensure our students needs are met. Interventions occur regularly, , the outcomes of these interventions are tracked using hard and soft data through student voice, outcomes in assessment, and participation in class.