Computing Curriculum Statement – 2021-22

INTENT:

The teaching of Computing at Great Western Academy aims to support students to become confident problem solvers who revel in the challenges that Computer Science can present. In order to help our students to become robust critical thinkers, we equip them with a range of computational methods, paired with a wide range of technical vocabulary to deepen their understanding and later application of the content. Our Computing curriculum aims to prepare students for a range of careers in an increasingly digital world, where not only are they digitally literate in a range of software, but independent and innovative creators, ready to change the world.

We are passionate in our support of the school's overarching vision; for students to be ACE. We focus on Achievement, supporting students to make rapid progress from each starting point; on Care, encouraging students to lead happy, safe, and successful lives – particularly through their understanding of the challenges faced in the modern world; and on Excellence, supporting students to be truly aspirational and to achieve more than they first thought possible.

Key Stage 3:

Students at Great Western Academy will benefit from a robust spiralling curriculum where key theory and skills are revisited annually to ensure success. Our curriculum has been designed to exceed the expectations set out by the National Curriculum

The Computing department is committed to supporting whole school Enterprise Skills. We have planned into our schemes of learning explicit teaching of 'Skillsbuilder' steps across these themes – Teamwork, Leadership, Creativity, Problem Solving, Listening and Presenting.

The key themes studied through Key Stage 3 are outlined below:

	Theory	Computational Thinking	Programming	Careers with Computing	Theory	Project Management
Skillsbuilder Focus:	Listening	Problem Solving	Creativity and Problem Solving	Creativity	Presenting	Creativity and Problem Solving
Year 7	E-Safety & Microsoft Literacy *5 9	Introduction to Algorithms*1	Scratch Animation *3 7	Publishing *78	Software and Hardware *5	Excel *5
	* Exceeds the expectations of the National Curriculum bullet point for KS3 outlined here					
Year 8	Network Security *9	Computational Thinking *2	Python Programming *2 3 4	Web Design (HTML) *3 7 8	Introduction to Binary and Hexadecimal*6	Computing Past, Present and Future *7
	* Exceeds the expectations of the National Curriculum bullet point for KS3 outlined here					
Year 9	Ethics *9	Data Representation*6	Game Development *3	Engineering *7	CPU Architecture*6	Computing in… Getting Ready for GCSE. *7
	* Exceeds the expectations of the National Curriculum bullet point for KS3 outlined here					

Key Stage 4:

All students that follow the full Key Stage 3 Computing curriculum will be fully equipped to study any of the three different pathways into GCSE which are outlined below:

- **OCR GCSE Computer Science**

Students will engage in a course that is practical, encourages creativity and promotes problem solving. The course supports students to develop their understanding and application of the core concepts of computer science.

Students also learn to analyse problems in computational terms and devise creative solutions by designing, writing, testing, and evaluating programs. The course is split into two key themes, each with a range of units:

1. Computer Systems
   1.1 Systems architecture
   1.2 Memory and Storage
   1.3 Computer networks, connections and protocols
   1.4 Network Security
   1.5 Systems software
   1.6 Ethical, legal, cultural and environmental impacts of digital technology

2 Computational Thinking, Algorithms and Programming
   2.1 Algorithms
   2.2 Programming fundamentals
   2.3 Producing robust programs
   2.4 Boolean logic
   2.5 Programming languages and Integrated Development Environments

This pathway is ideal for students who want to continue to develop their programming knowledge and application skills.

- **OCR Cambridge Nationals in Information Technologies**

This course will improve student's knowledge of the digital environment and enhance their confidence with IT. Students will learn about data management issues and develop practical skills by planning and creating an integrated technological solution to communicate information. This course is split into two assessed units:

- Written exam paper: Understanding tools, techniques, methods and processes for technological solutions
  Students develop their knowledge and understanding of different hardware and software applications and the tools and techniques used to select, store, manipulate and present data. They also explore the various risks associated with the collection, storage and use of data, including legal, moral, ethical and security issues, and how such risks can be mitigated.

- Centre Assessed Task: Developing technological solutions
  Students create a technological solution that processes data and communicates information, following the phases of the project life cycle using different hardware and software technologies to create an integrated technological solution. They develop practical skills such as carrying out a SWOT analysis, creating GANTT charts, developing online surveys, and presenting data through web-based technologies.

This pathway is ideal for students wanting to continue their studies of information and communication technologies.
**This pathway is only available for students currently in Year 10.*

- **OCR Cambridge Nationals in Creative iMedia**

This course will inspire and equip students with the confidence to use the skills that are relevant to the digital media sector. Students will design, plan, create and review digital media products to meet client and target audience demands. The qualification is split into three components:

- Written exam paper on The Media Industry.
- Centre Assessed Task on Visual identity and digital graphics**.**
- Optional Centre Assessed Task on one of the following:
  - Characters and comics:
  - Animation with audio:
  - Interactive digital media:

- Visual imaging
- Digital gaming

This pathway is ideal for students wanting to develop the creative skills developed in the KS3 Computing curriculum
**This pathway will be first available in September 2022.*

Key Stage 5:

Our Sixth Form students can continue their studies of Computer Science my studying the OCR A-Level in Computer Science. This A Level Computer Science qualification helps students understand the core academic principles of computer science. Classroom learning is transferred into creating real-world systems through the creation of an independent programming project. Our A Level students will develop their technical understanding and their ability to analyse and solve problems using computational thinking. The three components studied include:

- Component 01: Computer systems

Students are introduced to the internal workings of the (CPU), data exchange, software development, data types and legal and ethical issues. The resulting knowledge and understanding will underpin their work in component 03. It covers:

- The characteristics of contemporary processors, input, output and storage devices
- Types of software and the different methodologies used to develop software
- Data exchange between different systems
- Data types, data structures and algorithms
- Legal, moral, cultural and ethical issues.

- Component 02: Algorithms and programming

This builds on component 01 to include computational thinking and problem-solving. It covers:

- What is meant by computational thinking (thinking abstractly, thinking ahead, thinking procedurally etc.)
- Problem solving and programming – how computers and programs can be used to solve problems
- Algorithms and how they can be used to describe and solve problems.

- Component 03: Programming project

Students are expected to apply the principles of computational thinking to a practical coding programming project. They will analyse, design, develop, test, evaluate and document a program written in a suitable programming language. The project is designed to be independently chosen by the student and provides them with the flexibility to investigate projects within the diverse field of computer science. We support a wide and diverse range of languages.

IMPLEMENTATION:

Each scheme of work is designed to outline what we teach to ensure the intent of our curriculum is delivered across each key stage.

Our schemes of learning include:

Long term overviews:
- Interleaving of prior learning
- Topic outline summarising key content

Medium term plans:
- Root enquiry and key enquiry questions
- Key Knowledge, Skills and Understanding (delivered through know, apply, extend learning objectives/outcomes)
- Duration
- Planned assessment of student progress and impact of taught curriculum
- Assessment and improvement opportunities (DIRT)
- SMSC
- Literacy and Numeracy
- Opportunities to extend learning
- Enterprise skills
- Appropriate challenge and differentiation opportunities

Assessment Cycle and Feedback Policy:

- **Key Stage 3:**
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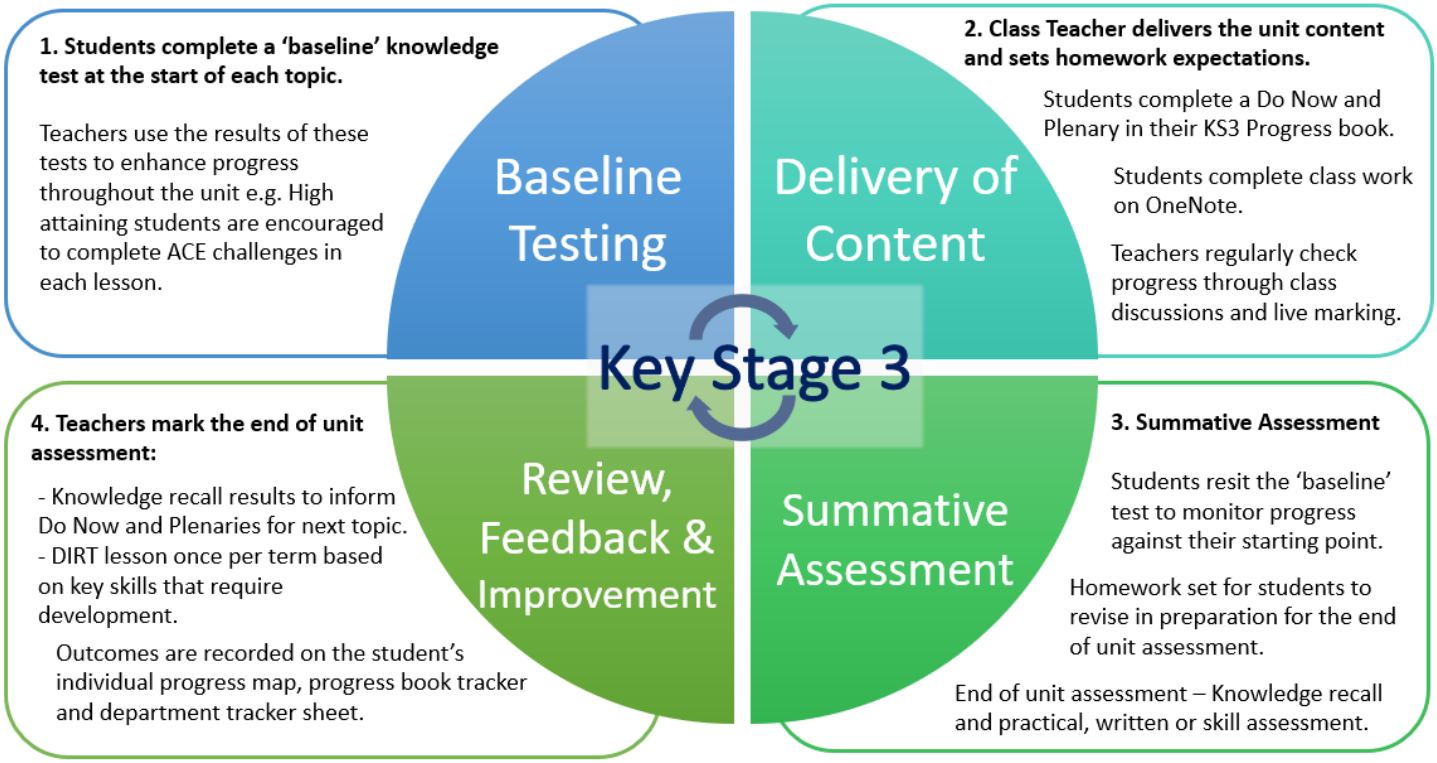
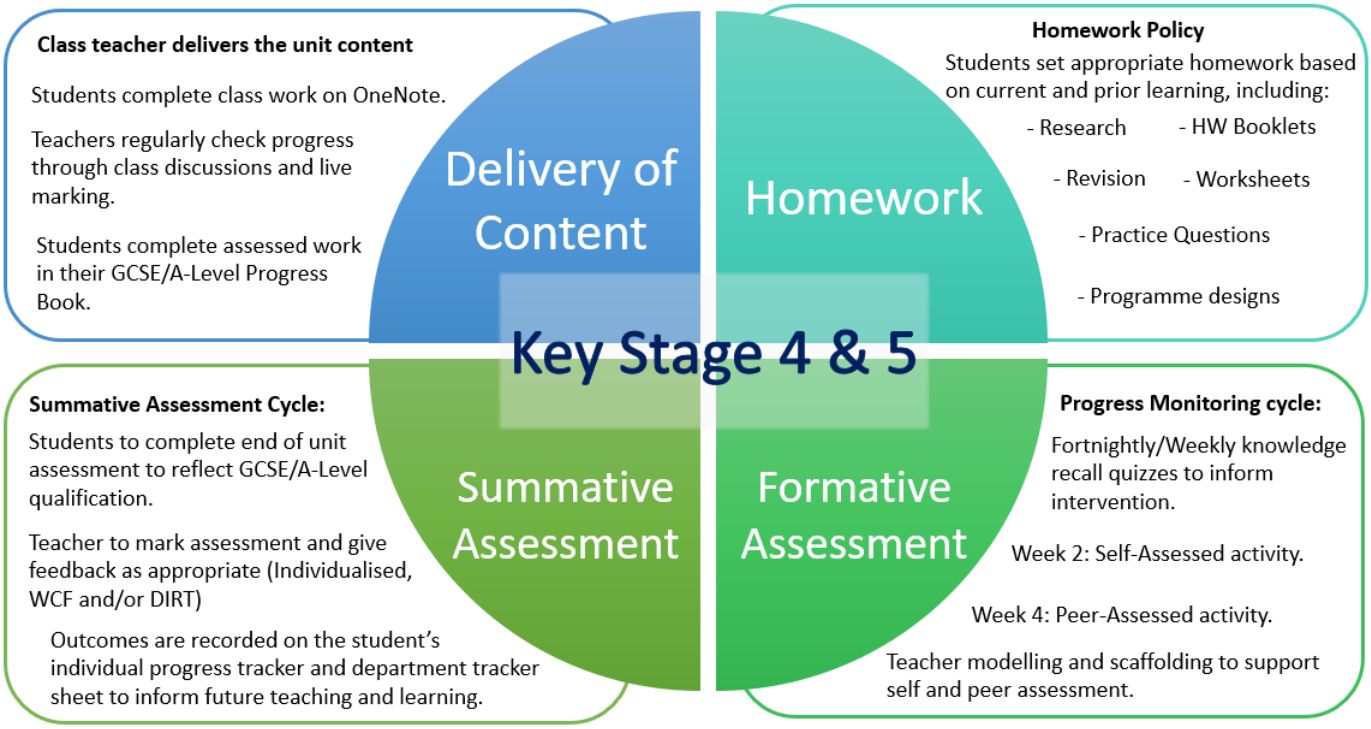
The Computing Department is dedicated to high quality teaching and learning. The assessment and feedback cycle below outlines the implementation of our curriculum to ensure maximum impact on student progress in Key Stage 3.



- **Key Stage 4 and 5:**

The Key Stage 3 assessment and feedback cycle feeds into that at Key Stage 4 and 5. Where student progress is monitored, again to secure maximum progress in each individual student. Homework is purposeful and feedback is regular and effective.



IMPACT:

All students of Computing centred subjects will be critical thinkers and successful problem solvers. Our students will have the knowledge, skills and creative abilities to succeed in Computer Science, Creative iMedia and IT.

ONGOING TEACHER ASSESSMENT

Our schemes of learning focus on assessment and improvement opportunities and the Computing Department are committed to providing regular and timely written and verbal feedback in line with the school's policy. This enables ongoing reflection on the impact of the curriculum on student progress.

INTERNAL EXAMINATION RESULTS

Students will complete regular termly and/or half-termly end of unit assessments to enable the impact of our curriculum to be measured. Each assessment will assess current and prior content to truly measure the impact of our curriculum on their long-term memory. Internal assessments will prepare students for their external exams by assessing a range of different skills.

EXTERNAL EXAMINATION RESULTS

In year 11 & 13 our results in national examinations will be a clear measure of the impact of the curriculum. These results will be the culmination of a data trail tracking from a student's first term at GWA as part of the school's annual data collection and reporting of progress cycle.

ENTERPRISE SKILLS

In line with the whole school drive on Enterprise skills, the explicit teaching against 'Skillsbuilder' steps is measured through students evidencing progress within their tracking tool.

IMPACT

WORK REVIEWS

We learn from the 3 annual whole school led work reviews and conduct our work reviews, moderation & standardisation of OneNote pages, progress books and assessments in a clear cycle of department meetings. throughout the year.

STUDENT SURVEYS

Student voice is utilised to understand the impact of the curriculum. Student voice is collected annually, seeking student feedback on their understanding on their own progress, the curriculum and lesson experiences.

MODERATION

Annual moderation meetings take place within the department to provide quality assurance and better support department wide reflection on the impact of the curriculum. Where possible (and appropriate) opportunities for external moderation with other high performing schools are sought or through exam board network / CPD sessions.

DESTINATIONS

The eventual destinations of students, and the extent to which they are able to lead happy, successful lives, will be the ultimate measure of curriculum impact.

Read the Department Improvement Plan for Business, Computing and Economics for more information.