

COMPUTER SCIENCE DEPARTMENT CURRICULUM STATEMENT – 2019-20

INTENT:

Our aim in the Computing Department at GWA is to support students to become confident problem solvers who revel in the challenges that Computer Science can present. In order 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. Living in an ever increasingly digital world pupils no longer only require basic skills to use computers but also a firm understand on how they work alone and together. Cross curricular learning is frequently available to students to increase their digital literacy using the equipment provided.

Key Stage 3

Our Key Stage 3 provision is allied to the National Curriculum in England. This means that they will be able to:

- design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems
- understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching]; use logical reasoning to compare the utility of alternative algorithms for the same problem
- use 2 or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures [for example, lists, tables or arrays]; design and develop modular programs that use procedures or functions
- understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming; understand how numbers can be represented in binary, and be able to carry out simple operations on binary numbers [for example, binary addition, and conversion between binary and decimal]
- understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems
- understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits
- undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users
- create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability
- understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct, and know how to report concerns

We aim also to prepare students for success at GCSE and beyond. As such, students are challenged to respond to GCSE style questions from the very beginning of KS3 and will receive advice and guidance about how to improve their answers in line with GCSE success criteria.

In addition, the Computer Science department is committed to supporting whole school Enterprise Skills. We have planned into our schemes of learning explicit teaching of 'Skillsbuilder' steps across years 7-11 in all six skills – Teamwork, Leadership, Creativity, Problem Solving, Listening and Presenting.

Skill	Year 7	Year 8	Year 9	Year 10	Year 11
Teamwork	All year	All Year			
Leadership					
Creativity					
Problem Solving	Term 3 onwards	Term 3 onwards			
Listening					
Presenting	Term 4	Term 4			

Key Stage 4

KS4 Computer Science will follow the OCR specification, which is split into two main components:

1. Computer Systems
2. Computational thinking, algorithms and programming.

The qualification is the equivalent to taking a higher tier science qualification in comparison. The content in our KS3 provision is directly mapped from the GCSE specification to ensure the students have a strong knowledge base to build upon from the very beginning of their GCSE journey.

The content they study at KS4 also follows into the A Level where pupils then deepen their knowledge further.

Key Stage 5

Studies at KS5 are through OCR for Computer Science. Within the course students will gain an understanding and ability to apply the fundamental principles and concepts of computer science, including: abstraction, decomposition, logic, algorithms and data representation. They will also explore a language of their choice to create a solution that solves a problem of their own recognition, developing their ability to think creatively, innovatively, analytically, logically and critically. The depth of the maths at KS5 within Computer Science is comparable to that studied within the Further Maths A Level also.

A Level Computer Science

- The characteristics of contemporary processors, input, output and storage devices
- Software and software development
- Exchanging data
- Data types, data structures and algorithms
- Legal, moral, cultural and ethical issues
- Elements of computational thinking
- Problem solving and programming
- Algorithms to solve problems and standard algorithms

IMPLEMENTATION:

Please see links to the right to our long-term and medium-term schemes of learning. These schemes are 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:

- Clear links to prior learning (Y7 linked to KS2, Y7 to Y8 and so on)
- 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) – through fortnightly quizzes
- Literacy and Numeracy
- Opportunities to extend learning
- Enterprise skills in the form of projects
- Appropriate challenge and differentiation opportunities

LONG TERM
Click on the links below:
Year 7
Year 8
Year 9
Year 10
Year 11
Year 12
Year 13

MEDIUM TERM
Click on the links below:
Year 7
Year 8
Year 9
Year 10
Year 11
Year 12
Year 13

IMPACT:

ONGOING TEACHER ASSESSMENT

Our lessons focus on timely and regular feedback to all students. Often in Computer Science this takes the form of AfL through Mini-whiteboard questions and no-hands up questioning. We also complete an end of topic assessment either online or on paper for each topic taught.

INTERNAL EXAMINATION RESULTS

Students undertake a minimum of three key assessments using GCSE or GCSE style questions each year 7-9, KS4 and 5. On each occasion, teaching staff evaluate the impact of the curriculum by assessing student progress against stated learning objectives. Formal exams are conducted at the end of each year, offering a further opportunity to assess student progress and make judgements about the impact of the taught curriculum.

EXTERNAL EXAMINATION RESULTS

At KS4 and 5, 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.

HOME LEARNING

Students complete homework when it is a necessary extension of classroom learning. For Computer Science at this stage it is not always appropriate to set weekly homework due to content being delivered.

IMPACT**WORK REVIEWS**

We learn from the 3 annual school work reviews and conduct our own moderation of exercise books and assessments in a clear cycle of department meetings throughout the year.

STUDENT SURVEYS

The Computer Science department survey's students in all year groups as a minimum annually, seeking student feedback on the effectiveness of the taught units from a learner point of view and harvesting student voice to ensure the curriculum is kept lively, engaging and relative.

GLA Testing

To seek understanding of the progress made, GLA testing allows us to see the impact of the learning in Computer Science across KS3.

Where possible (and appropriate) opportunities for external moderation with other high performing schools are sought.

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 annual Curriculum Impact Report for more information