Computing & ICT

Curriculum Information, Intent and Map

Hutton Church of England Grammar School

Staff:

- Mr N Hulme: **Subject Lead**
- Mrs H Allan
- Mr D Dwyer
- Mrs L Downton

Intent:

The curriculum we offer is designed to prepare our students for life outside of the classroom or for further study in our subject, by exposing them to real life or workplace problems. This is embodied in Timothy 3:17:

"That the man of God may be competent, equipped for every good work"

The Department's Computing & ICT curriculum enable them to become decent, honest young adults who are able to make a positive contribution to their community, whether that be friends, family or the wider world. Through the development of a student's technical knowledge they are able to pass on their understanding to those who need it and use it to help those who may be struggling in a fast developing technological world. It also ensures that each student who passes through the department has the necessary technical skills to enter into the world of employment or further study.

The Computing & ICT Department curriculum therefore covers three broad areas:

- **Digital literacy**: appropriate and responsible use of technology which includes online safety. The use of the Microsoft Office Suite of programs is taught discretely throughout the curriculum.

- **Principles of computing**: computational thinking, programming skills in different programming languages, understanding how computers work. Learning how to use computers to solve problems

- **Information technology**: using ICT to analyse and solve problems and communicate and share ideas with others

All aspects of the curriculum are delivered in a way that relates to real life situations and problems to deepen the understanding of the student as a whole.

Resilience, determination and problem solving skills should be evident in the students that experience and are engaged in our curriculum, skills which are reinforced in all aspects of school life and embodied in Colossians 3:23:

<p align="center">"Whatever you do work at it with all your heart"</p>

Computing Programmes of Study: Key Stages 3 & 4 National Curriculum in England

Purpose of Study

A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which 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. Computing also ensures that pupils become digitally literate – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world.

Aims

The national curriculum for computing aims to ensure that all pupils:

♣ can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation

♣ can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems

♣ can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems

♣ are responsible, competent, confident and creative users of information and communication technology.

Attainment Targets

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study

Subject Content in Key Stage 3 & 4

Key Stage 3

Pupils should be taught 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; use logical reasoning to compare the utility of alternative algorithms for the same problem

♣ use two or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures; design and develop modular programs that use procedures or functions

♣ understand simple Boolean logic 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

♣ 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, re-use, revise and re-purpose 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.

Key Stage 4

All pupils must have the opportunity to study aspects of information technology and computer science at sufficient depth to allow them to progress to higher levels of study or to a professional career.

All pupils should be taught to:

♣ develop their capability, creativity and knowledge in computer science, digital media and information technology

♣ develop and apply their analytic, problem-solving, design, and computational thinking skills

♣ understand how changes in technology affect safety, including new ways to protect their online privacy and identity, and how to identify and report a range of concerns.

Curriculum Map:

Year	Half term 1	Half term 2		Half term 3	Half term 4		Half term 5	Half Term 6

7	Baseline testing Collaborating online respectfully	Using Media - gaining support for a cause	Computational thinking	Programming in Scratch	Spreadsheets	Create an adventure story - PowerPoint Baseline testing
8	Baseline testing Computing systems	Media - Vector graphics	Mobile App development	Python programming	Databases	MicroBiT programming - Sensing Baseline testing
9	Baseline testing Multimedia project - iMedia taster	Multimedia project - iMedia taster	Python Programming - GCSE Computer Science taster	Computers and Networks - GCSE Computer Science	Cybersecurity Data Science	Data Science Media - Animations Baseline testing
	We follow the **OCR J277** GCSE specification for Computer Science					
10	Systems Architecture Memory and storage 1	Systems Software Programming Fundamentals	Algorithms part 1 Practical programming	Algorithms Producing robust programs Practical Programming	Producing robust programs Practical programming	Programming languages and IDEs Practical Programming

| 11 | Memory and Storage part 2

Boolean Logic | Computer Networks | | Network security | Ethical, legal and cultural factors of computing | Algorithms part2

Revision | GCSE

Examinations |

OCR Cambridge Nationals in Creative iMedia

| 10 | Moodboards

Mind maps

Visualisation-Diagrams

Storyboards

File types

Reviews

Version and naming conventions | Scripts

Client briefs

Target Audience

Planning and timescales

Research

Health and Safety

Legislation

Revision for exam in January | | R081 Exam Jan. 2022

R082 Coursework - Creating Digital Graphics | R082 Coursework - Creating Digital Graphics | R082 Coursework - Creating Digital Graphics | R087 Coursework - Interactive Multimedia products |
| 11 | R087 Coursework - Interactive Multimedia products | R087 Coursework - Interactive Multimedia products | | R092 Coursework - Creating Digital Games | R092 Coursework - Creating Digital Games | R092 Coursework - Creating Digital Games

(to be finished 01/05/22) | EXAMS |

AQA A Level Computer Science						
12	Fundamentals of programming + OOP Data Representation	Fundamentals of programming + OOP Data Representation	Problem Solving Hardware and Software	Problem Solving Computer architecture Hardware and Software	Regular Languages Project Databases	Project
13	Programming Project Abstract Data Structures	Programming Project (to finish before Xmas) Algorithms	Skeleton program analysis Communications (Ethics)	Skeleton program - practical programming and questions Internet Functional programming	Skeleton - revision theory Revision	EXAMS

For additional course & curricular information please see:

GCSE: Options Booklet (KS4 Curriculum & GCSE Options Information Tab)

A Level: Sixth Form Course Booklet (Sixth Form Course Booklet Tab)