



## IT & Computer Science Department Delivery Grid 2021-2022

### Intent

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 & Technology, and provides insights into both natural and artificial systems. The core of computing at Studley High School 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.

The 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

We wish to enthuse students to have an understanding far deeper than the interface that they currently operate. We aim to enable students to develop a love of learning for the subject and an understanding that there are no limits to their own development in programming and IT. Students will be given guidance on how to work safely on-line so that it will be second nature to carry out all the necessary steps for their own safety as well as those around them, creating a world of positive digital citizens.

At KS3 students will be given the opportunity to develop their computer coding and digital technology skills. Learning the language of code is an important added bonus as students who develop their coding skills will be able to grasp the magic behind the computers.



Pupils are 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 [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

### **Implementation**

Pupils are taught using a range of learning resources which help them to develop a broad range of skills in a variety of software packages. Modelling and application of these skills makes up a large proportion of lesson time, in which pupils are given the skills and knowledge to make choices as to how IT can be best used to present their ideas. Once pupils are confident in using a piece of software they will be required to work more independently to complete practical projects in which application of these skills are assessed to ensure progress is being made.

Pupils will explore Computing through practical project work, research and independent work using a variety of resources, such as desktop PC's, laptops, interactive presentations, whiteboards, online learning experiences, Microbits and visualisers to model key concepts and examples.



There are regular opportunities for pupils to explore how IT is developing and changing the world we live in, as we discuss news articles, job opportunities and the importance of digital citizenship. Pupils have the opportunity to attend coding clubs and support IT in the school by becoming IT ambassadors. Pupil progress is facilitated through detailed planning of lessons and practical activities, revision classes and scaffolded concepts across the Key Stages.

Progression in Computing is measured through both formative and summative assessments, including practice papers, teacher questioning, regular feedback, classroom observation and individual discussions. Due to the nature of the subject formal assessments are often based around practical project work in which pupils will demonstrate the skills they have developed and describe their understanding of what they have done.

### **Impact**

Through the IT curriculum, students develop skills and knowledge in computer science and digital technologies to prepare them for a future in a world where the use of technology is fully embodied. Pupils make good progress in IT at KS3 and KS4 and attainment at KS4 is consistently in line with national averages.

Through IT pupils develop skills to allow them to logically break down and plan to solve problems and work as part of a team. Pupils fully understand the importance of their digital footprint and ensure that their online presence will not hinder their choices for the future. Our learners are confident users of IT and can make appropriate, well considered decisions about the tools they use to investigate and present information. This will allow them to take their studies onto KS4 and to Further and Higher education if they desire and ultimately secure a career within a large range of industries.

## KS3 IT Topics



		<b>Autumn A</b> <i>7weeks</i>	<b>Autumn B</b> <i>7 weeks</i>	<b>Spring A</b> <i>7weeks</i>	<b>Spring B</b> <i>6 weeks</i>	<b>Summer A</b> <i>5 weeks</i>	<b>Summer B</b> <i>7weeks</i>
<b>Year 7</b>	<b>TOPIC</b>	Intro to Computing & Programming	Introduction to Programming	Office Skills and File Management Project	Web Design - Introduction to HTML	Computer Hardware	Arcade Game Maker
	<b>ASSESSMENT</b>	Formative - All About Me  Formative - E-Safety  Diagnostic - Base Line Assessment	Formative - Chat Bot  Formative - Calculator  Diagnostic - Unit Scratch Assessment	Formative - Spreadsheet Task  Formative - Festival Group Presentations  Diagnostic - Office Assessment	Formative - Page design (visualisation diagram)  Formative - Final Website  Diagnostic - HTML Quiz	Formative - Hardware Presentation  Formative - Computer Components Advice  Diagnostic - Computer Hardware Assessment	Formative - Project planning  Formative - Evaluation  Diagnostic - Final Game
	<b>SKILL FOCUS</b>	Skill Focus - Using school systems effectively.  Basic IT skills -	Skill Focus - Programming fundamental	Skill Focus - IT Skills for life, Audience and Purpose.	Skill Focus - Web design, page layout/graphics		Skill Focus - Planning skills



		presenting information		Planning			
<b>Year 8</b>	<b>TOPIC</b>	My Digital World & Programming with Micro Bits	Binary, Bits and Bobs inc computational thinking	Introduction to Python	HTML & CSS	Platform Game Maker (Scratch Game Design using Pre-production techniques)	Back to the Future
	<b>ASSESSMENT</b>	Formative - Copyright Booklet  Formative - E-Safety Poster  Diagnostic -End of unit Quiz	Formative - Binary  Formative - Representing Images  Diagnostic - Binary Bits and Bobs end of unit assessment	Formative - Python Code 1  Formative - Python Code 2  Diagnostic - Assessed - Practical programming project	Formative - Page design (visualisation diagram)  Formative - Evaluation  Diagnostic - Website / code	Formative - Visualisation Diagram  Formative - Evaluation  Diagnostic - Final Game: Design, Gameplay, Complexity, Testing	Formative - History Timeline  Formative - Multimedia Product  Diagnostic - Back to the Future Quiz
	<b>SKILL FOCUS</b>	Skill Focus - Research skills	Skill Focus - Application of maths	Skill Focus - Programming	Skill Focus - Web design. Graphics.	Skill Focus - Programming & Evaluation	Skill Focus - IT Skills, multimedia, research



	TOPIC	Programming and Algorithms	Web Design	IT for Business	Databases and SQL	Logic gates, truth tables and data	Graphics
<b>Year 9</b>	<b>ASSESSMENT</b>	Formative - Flow Chart  Formative - Python Code Project  Diagnostic - Unit Quiz	Formative - Planning tools  Formative - Website  Diagnostic - Unit Quiz	Formative - Marketing Poster  Formative - Finances  Diagnostic - Unit Quiz	Formative - Database table / form  Formative - Form  Diagnostic - Searching and Sorting Quiz	Formative - Logic gate task  Formative - Data representation task  Diagnostic - End of unit quiz	Formative - Graphic Design  Formative - Graphic creation  Diagnostic - End of unit Quiz
	<b>SKILL FOCUS</b>	Problem solving, programming with Python	Interpretation of client brief, audience and purpose. Web Design	Planning, Presenting information, IT skills for business. Working as part of a team.	Creating and using a database. Searching and Sorting algorithms.	Application of maths. Drawing and understanding logic gates.	Photoshop skills: analysing graphics, layers, tools, filters, removing backgrounds



## IT (IMedia - Cambridge Nationals)

(Reflects current Year 10 starting the qualification in 2020)

*The delivery grid reflects that the current year 10 & 11, started the qualification in year 9. A second grid will be added next year to show the delivery of the qualification over 2 years.*

IT	Autumn A <i>8 weeks</i>	Autumn B <i>7 weeks</i>	Spring A <i>6 weeks</i>	Spring B <i>6 weeks</i>	Summer A <i>5 weeks</i>	Summer B <i>5 weeks (plus 2 new timetable)</i>
<b>Year 9</b>	Web Design Level 1	Graphics Level 1	Multimedia Level 1	Multimedia Level 1	Pre Production Planning Tools	Graphics Assignment Intro
	Assessed - Website project	Assessed - Graphic Project	N/A	Assessed - Multimedia Project	R081 Mock 1	R082 (Live Assignment)
	Citizen - Digital ethics, & Internet and Web, E-safety  Maker - Making websites, Jr Web Designer	Worker - Colours & Image Specialist  Maker - Graphic Design  Entrepreneur - Advertising  Citizen - Safe online	Worker - User Interfaces, User Experience  Maker - Video Editing, Animation  Citizen - GDPR	Worker - User Experience  Citizen - Fake News, Social Media Setup  Entrepreneur - Social Selling, Researcher	Worker - Projects, Collaboration  Citizen - Cyber Security  Maker - Coding Solutions	Worker - Design Psychology  Gamer - Intro to Gaming, BAFTA Game Design concept, Game Designer
<b>Year 10*</b>	Graphics Assignment Level 2	R081 Prep	Web Design Assignment	Web Design Assignment	R081 Revision & IDEA - Worker Badge	Multimedia Skills  IDEA - Maker Badge



	R082 (Live Assignment)	R082 (Live Assignment)	R085 (Live Assignment)	R085 (Live Assignment)	R081 Mock 2	R087 (Live Assignment) R081 (REAL)
	Silver Badges		Maker - Making Websites	Maker - JR Web Designer		
Year 11	Multimedia Assignment Level 2	Multimedia Assignment Assignment Level 2	R082 RESIT	R082 RESIT		
	R085 RESIT R087 (Live Assignment)	R081 Mock 3	R081 EXAM ?	R092 Game Making Extension		R081 EXAM
			BAFTA Game Concept, Game Designer			





### Curriculum enrichment at KS4

<b>Topic to be extended/enriched</b>	<b>Knowledge development</b> <i>Including possible interdisciplinary links</i>	<b>Skill development</b>	<b>Attitude development</b>
Enrichment week: Research (once a term, a week will be used for pupils to investigate IT in their world)	Looking at the future - Artificial Intelligence. News - e.g Hacking stories, new developments in 5G, Digital democracy, Law related to IT use, Social divide, Ethics	Planned time for research and class presentation	Independence. Digital citizenship. Group/paired work.
IDEA - Digital Badges that are gained and awarded with Bronze, Silver and Gold certificates.	Broadening the depth of pupils knowledge in relation to citizenship, Working with IT, Making Digital Products, Gaming and Entrepreneurship.	Note making and independent learning. Building skills for the workplace.	Independence. Digital citizenship.



## GCSE COMPUTER SCIENCE (TAUGHT AFTER SCHOOL Extra)

**The delivery grid reflects that the current year 10 & 11, started the qualification in year 9. A second grid will be added next year to show the delivery of the qualification over 2 years.**

Computer Science	Autumn A 8 weeks	Autumn B 7 weeks	Spring A 6 weeks	Spring B 6 weeks	Summer A 5 weeks	Summer B 5 weeks (plus 2 new timetable)
Year 9	Hardware and Software	Understanding Algorithms with Java & Python	Networks and the Internet	IT in the real world	<i>Advanced Python</i>	Data Representation & Logic
	IDEA - User Interfaces & User Experience	IDEA - Random Coding	IDEA - Internet and the web	IDEA - AI & Automation	IDEA - Python Quiz	
Year 10	Hardware	Software	Networks	Back to Python	Programming Project	Programming Project & Revision
			IDEA - What is the Cloud?			
Year 11	Data Representation & Logic Gates	Understanding, editing and writing algorithms	Ethical, legal and Social Impact & Hardware & Software	Networks & Revision		
			IDEA - Digital Ethics			



### Curriculum enrichment at KS4

Topic to be extended/enriched	Knowledge development <i>Including possible interdisciplinary links</i>	Skill development	Attitude development
Enrichment week: Research (once a term, a week will be used for pupils to investigate IT in their world)	Looking at the future - Artificial Intelligence. News - e.g Hacking stories, new developments in 5G, Digital democracy, Law related to IT use, Social divide, Ethics	Planned time for research and class presentation	Independence. Digital citizenship. Group/paired work.
IDEA - Digital Badges that are gained and awarded with Bronze, Silver and Gold certificates.	Broadening the depth of pupils knowledge in relation to citizenship, Working with IT, Making Digital Products, Gaming and Entrepreneurship.	Note making and independent learning. Building skills for the workplace.	Independence. Digital citizenship.
MicroBits - Java (Extra language)	Broadening understanding of coding by applying their knowledge in multiple languages. Introducing Java with the Micro:bits.	Coding with Java	Apply to real world projects. Team work. Creativity.