

Computer Science Curriculum Overview - Key Stage 3

Aim: Computing is fundamental to understanding and participating in society and it is valuable for every student to learn as part of a modern education. Since the invention of the Internet, the development of new computing technologies has steadily increased, leading to fundamental change in the way we live and work. It is important that in school we equip students with the skills needed to use, understand and in the future improve the technology that surrounds them, as well as warn of potential dangers.

During KS3 students are taught a blend of ICT and Computer Science. We aim to promote the student's digital literacy and their effective use of computers, such being able to send emails, creating folder structures, staying safe online and protecting their information. The field of computer science is broad. It teaches students design, logical reasoning, and problem solving – all skills that are valuable beyond the computer science classroom. In our lessons, we also promote the school's 4R policy, being respectful, responsible, resilient and ready to learn. For example, all students are taught about e-safety. They are informed about the importance of being **respectful** when engaging with others online, and the dangers of misuse of the internet or social media. Students are encouraged to take **responsibility** for their own learning. All learning resources are shared via google classroom. This enables students to review their learning outside of lessons, e.g. as part of their revision or if lessons have been missed. Students are encouraged to be **resilient** and learn from their mistakes. This is the case every lesson, where students can adapt their answers in green font, following feedback or class discussion. In addition, after all assessments all students complete follow-up activities, which enable them to work on and improve on their weaknesses. All students are set regular revision homework. Pupils are expected to complete Flash cards for homework each week and these are checked at the start of each lesson (**ready to learn**). Revision websites have been created which promote independent learning along with lesson where pupils are expected to follow user guides to complete tasks. Previous learning is informally assessed at the start of the lesson with a low stakes quiz.

Sequencing: Year 7 and 8 are taught a mixture of ICT and Computer Science. In Year 7, pupils will build on their previous learning from Primary School (Scratch programming and using Microsoft PowerPoint). At the start of the year, the students will learn about the **history of computing**, as understanding how and why technology developed will aid them in their understanding of the computers we have today. They will then begin to learn how to use more **specialised software** and use GameMaker to build upon their understanding of using instructions to create games. In year 8, students will further develop their understanding of specialised software including Microsoft Access and how to **create Websites** using HTML. The students will also be introduced to their first **programming language (Python)**. This will be useful for those students who take GCSE Computer Science, where their programming skills will be developed further. At the end of the year students will learn how use Fireworks/Photoshop. This knowledge is useful for students who wish to take iMedia in KS4. In Year 9, students will continue to develop their programming skills, by learning how to use **SQL language** when using **database** and build a broader knowledge of the Computer Science curriculum. At the end of the Year, students will learn how to use **Adobe Flash and create animations**. This will help students prepare for the iMedia option where one of the units is creating animations.

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	Suggested Revision Website	Exam Board Link	Recommended Revision Guide
Year 7	Introduction to Computers - Looking at History of Computers, transistors, Moore's Law and Computer Components.	Introduction to Computers - Converting Binary to Denary and Denary to Binary, along with Binary Addition.	E-Safety - How to stay safe online and the importance of keeping data private and not over sharing information. Students will be reminded of CEOP and shown examples of the dangers of the internet.	Spreadsheets - Students will learn how to use basic formulas, how to create charts and how to use advanced formulas. Students will then be expected to model scenarios so they understand the usefulness of using spreadsheets.		Gamemaker- Students will learn how to make Games using GameMaker software. They will be following tutorials and will plan and make their own game once completed.	Google Classroom is actively used in all lessons and classwork can be accessed at home, along with notes. (opportunity to do work at home if absent).Flash cards are expected to be made using learning from lessons. https://sites.google.com/aldridge.school.org/year-7-computing/home	n/a at KS3	https://www.amazon.co.uk/New-Computing-Complete-Revision-Practice/dp/178908279X/ref=sr_1_1?crid=2HDR9KY66GK5Y&keywords=ks3+computer+science&qid=1580984891&srefix=ks3+computer%2Caps%2C144&sr=8-1
Year 8	Introduction to Databases - Looking at ways in which data is stored, including advantages and disadvantages. Students will also create a database	Introduction to Website. Students will be learning to code websites using notepad and writing their own HTML code.	Introduction to Python – Students will be taking their first steps into programming and they will be learning different programming techniques.			Photo manipulation skills- students will be learning how to edit graphics and combine images.	Google Classroom is actively used in all lessons and classwork can be accessed at home, along with notes. (opportunity to do work at home if	n/a at KS3	https://www.amazon.co.uk/New-Computing-Complete-Revision-Practice/dp/178908279X/ref=sr_1_1?crid=2HDR9KY66GK5Y&keywords=ks3+computer+science&qid=1580984891&srefix=ks3+computer%2Caps%2C144&sr=8-1

							absent).Flash cards are expected to be made using learning from lessons. https://sites.google.com/aldridgeschool.org/year-7-computing/home		
Year 9	<ul style="list-style-type: none"> -Input/output Devices -Storage -Computer Components -Peripherals and Functions -Operating Systems -System Software -Utility - Software -Application Software 	<ul style="list-style-type: none"> -Primary Storage (RAM,ROM, CACHE) -Secondary Storage -Secondary Storage Characteristics 	<ul style="list-style-type: none"> -Moral Issues -Legal Issues -Environmental Issues -Open Source/ - Proprietary Software -Computing Legislation. 	<ul style="list-style-type: none"> -Boolean logic -Boolean Operators -Arithmetic Operators - Computational Thinking - Binary/Denary - Conversion -Binary Addition -Flow Charts SQL - database language 	<ul style="list-style-type: none"> -Units of Computer - Memory -Data storage/compression Data - representation (images,sound,image) -Variables Arrays -Data types Sequencing , comments Selection Iteration 	Flash Animation (Links to the iMedia Scheme of work). This will teach students how to use advanced tools in Adobe Flash, for example how to use motion tweening, looping element etc.	Google Classroom is actively used in all lessons and classwork can be accessed at home, along with notes. (opportunity to do work at home if absent).Flash cards are expected to be made using learning from lessons. https://sites.google.com/aldridgeschool.org/year-9-computing/home	n/a at KS3	https://www.amazon.co.uk/New-Computing-Complete-Revision-Practice/dp/178908279X/ref=sr_1_1?crid=2HDR9KY66GK5Y&keywords=ks3+computer+science&qid=1580984891&sprefix=ks3+computer%2Caps%2C144&sr=8-1

iMedia Curriculum Overview - Key Stage 4

Aim: The Cambridge National in Creative iMedia equips students with the wide range of knowledge and skills needed to work in the creative digital media sector. They start at pre-production and develop their skills through practical assignments as they create final multimedia products. This builds on knowledge students have gained in KS3, such as using Photoshop and Adobe Flash. This qualification is primarily assessed through the completion of coursework units, as well as one exam.

Sequencing:

KS4 Creative iMedia: Students are building on knowledge learned throughout key stage 3. They will apply their knowledge of Photoshop, Fireworks, as part of their coursework. Additionally they will learn about input/output devices in preparation for the exam unit. In the second year, students will apply their knowledge of Flash to complete their next piece of coursework. Their final two pieces of coursework will also build on the knowledge gained during their iMedia studies in Year 10. Each piece of coursework begins with a research task. The knowledge gained in this time will then inform the planning stage and applied to a scenario.

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	Suggested Revision Website	Exam Board Link	Recommended Revision Guide
Year 10	OCR Creative iMedia - R081 - Students will be learning about planning techniques when creating a digital product. They will be tested on this at the start of January. (External exam)		R082 - Creating Digital Graphics - Students will be completing a research task where they will be looking into digital graphics properties and uses. They will then commence with planning and creating a digital product based on an OCR scenario.		R091 - Games Design unit - students will first start with completing research into the generations of gaming along with gaming objectives, scenarios. Once this is completed the students will plan a game for a given OCR scenario.		Revision Website is provided using Google Sites. This can be accessed using school login. https://sites.google.com/aldrigehschool.org/ks4-creative-imedia/home	https://www.ocr.org.uk/qualifications/cambridge-nationals/creative-imedia-level-1-2-award-certificate-j807-j817/	My Revision Notes: OCR Cambridge Nationals in Creative iMedia L 1 / 2: Pre-production skills and Creating digital graphics
Year 11	R091 - Games Design unit - students will first start with		R086 - Animation unit - Students will complete research into the different		R086 - Animation unit - Students will complete research into the different types of				

	<p>completing research into the generations of gaming along with gaming objectives, scenarios. Once this is completed the students will plan a game for a given OCR scenario.</p>	<p>types of animations and their properties. Once completed the students will plan and create a animation for a given OCR scenario.</p>	<p>animations and their properties. Once completed the students will plan and create a animation for a given OCR scenario.</p>			
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Aim: To prepare pupils and give them an understanding of hardware and software. The key aim is to develop their problem solving skills and further enhance their programming skills in preparation for further education.

GCSE Computer Science builds on the knowledge students have built up during KS3, in particular the entry level course they completed in Year 9. The qualification aims to encourage students to develop their understanding and application of the core concepts in computer science. Students will learn to analyse problems in computational terms and devise creative solutions by designing, writing, testing and evaluating programs. They will complete one NEA project and their knowledge will be assessed in exams in Y11.

In our lessons, we also promote the school's **4R policy** being respectful, responsible, resilient and ready to learn. **Respectful** behaviour is expected in all lessons in line with the school policy. Students are encouraged to take pride in their coursework, or other work, which they show through their effort, presentation and quality of work. In iMedia students need to be able to manage their time wisely and show a **responsible** attitude towards the completion of their coursework from the start. Students are encouraged to develop **resilience** and learn from their mistakes. This is the case every lesson, where students can adapt their answers in green pen, following feedback or class discussion. In addition, after all assessments all students complete follow-up activities, which enable them to work on and improve on their weaknesses. For coursework modules, students are expected to re-read and re-draft their work until they have completed it to a good standard. All students are expected to show that they are **ready to learn** by completing revision homework. Students complete Flash cards for homework each week and these are checked at the start of each lesson or where appropriate continue working on their coursework. Previous learning is informally assessed at the start of the lesson with a low stakes quiz, where appropriate.

Sequencing:

KS4 Computer Science: During Year 9, students completed the entry level Computer Science course provided by OCR. This course has provided a foundation of knowledge to prepare students for the Computer Science GCSE where students will learn about the topics in more depth. The first unit introduces students to the central processing unit (CPU), computer memory and storage, wired and wireless networks, network topologies, system security and system software. It also looks at ethical, legal, cultural and environmental concerns associated with computer science. Students then apply this knowledge together with their programming skills learned in KS3 to help complete the programming project (NEA) This will further develop their programming skills. Upon completion, students will be tested on their knowledge from year 10 in preparation for exams at the end of Year 11.

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	Suggested Revision Website	Exam Board Link	Recommended Revision Guide
Year 10	<p>OCR Computer Science - Paper 1 - Components, The CPU, factors affecting performance, memory, secondary storage, units of storage</p> <p>OCR Computer Science - Paper 2 -Computational Thinking, Fundamental programming skills</p>	<p>OCR Computer Science - Paper 1 - LANs and WANs, network hardware, network security, system software, utility software</p> <p>OCR Computer Science - Paper 2 Representing algorithms - pseudocode and flow charts, Trace tables, Searching algorithms, sorting algorithms</p>	<p>OCR Computer Science - Paper 1 Compression, data representation, Legal, ethical and environmental issues</p> <p>OCR Computer Science - Paper 2 File handling, use of data structures, Arrays, defensive design, Testing and maintainability, Logic gates, translators, compilers and interpreters</p>				<p>A revision website can be accessed using Google Sites (Can view all class notes and extra revision resources) https://sites.google.com/aldrigedhschool.org/ks4computerscience/syllabus</p>	<p>https://www.ocr.org.uk/qualifications/gcse/computer-science-j277-from-2020/</p>	<p>https://www.amazon.co.uk/Computer-Science-Complete-Revision-Practice/dp/1782948600/ref=sr_1_1?keywords=computer+science+revision+guide&qid=1560849699&s=gateway&sr=8-1</p>
Year 11	<p>OCR Computer Science - Paper 1 Compression, data representation, Legal, ethical and environmental issues</p> <p>OCR Computer Science - Paper 2</p> <p>File handling, use of data structures, Arrays, defensive design, Testing and maintainability, Logic gates, translators, compilers and interpreters</p>	<p>Computer Science paper 2 - Algorithms - Computational thinking, flow charts, pseudocode, search and sort algorithms. Programming - Data types, operators , constants and variables, strings, Boolean operators, arrays, file handling, storing data and sub-programs. Design, Testing and IDE's - Defensive design, testing, translators, IDE's. Data</p>	<p>NEA - 20 hour Programming project - with revision built into lessons.</p> <p>Students are expected to create Revision Flash cards after each lesson. During the start of each lesson, students will be expected to answer practice exam questions in preparation for exam at the end of Year 11.</p>				<p>A revision website can be accessed using Google Sites (Can view all class notes and extra revision resources) https://sites.google.com/aldrigedhschool.org/ks4computerscience/syllabus</p>	<p>https://www.ocr.org.uk/qualifications/gcse/computer-science-j276-from-2016/</p>	<p>https://www.amazon.co.uk/Computer-Science-Complete-Revision-Practice/dp/1782948600/ref=sr_1_1?keywords=computer+science+revision+guide&qid=1560849699&s=gateway&sr=8-1</p>

		Representation - Logic, units, binary numbers, hexadecimal, characters, storing images and sound, compression.				
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Computer Science Curriculum Overview - Key Stage 5

Aim: Cambridge Technicals are vocational qualifications for students aged 16+. They are designed with the workplace in mind and provide a high-quality alternative to A Levels. The students gain an insight into the IT sector as they investigate the pace of technological change, IT infrastructure, the flow of information on a global scale, and the importance of legal and security considerations. There are a number of project-based coursework units, which complement the external exam.

In our lessons, we also promote the school's **4R policy** being respectful, responsible, resilient and ready to learn. **Respectful** behaviour is expected in all lessons in line with the school policy. Students are encouraged to take pride in their coursework, or other work, which they show through their effort, presentation and quality of work. Students need to be able to manage their time wisely and show a **responsible** attitude towards the completion of their coursework from the start. Students are encouraged to develop **resilience** and learn from their mistakes. This is the case every lesson, where students can adapt their answers in green pen, following feedback or class discussion. In addition, after all assessments all students complete follow-up activities, which enable them to work on and improve on their weaknesses. For coursework modules, students are expected to re-read and re-draft their work until they have completed it to a good standard. Attendance is crucial in a course that is largely assessed through coursework. Should an absence be unavoidable students are expected to make sure that they catch up with any work missed (**ready to learn**).

Sequence: The course begins with the theoretical units on fundamentals of IT and global information systems. The knowledge learned in these units will underpin all coursework projects that students undertake in the following units. The first coursework unit will be based on project management, giving students the opportunity to understand and use various project planning skills and techniques. They will then move on to the coursework unit on augmented and virtual reality. The students research both technologies and design both a Virtual and an Augmented Reality resource, as well as exploring future applications of Virtual and Augmented Reality. The final coursework unit is about the use of the Internet and how it is impacting people and society. Using their knowledge students will carry out a feasibility study for a potential idea, which they will pitch to potential stakeholders and use their feedback to revise their proposal.

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	Suggested Revision Website	Exam Board Link	Recommended Revision Guide
Year 12	Unit 1 - It Systems (external exam): Information learnt in this unit will create a solid foundation in the fundamentals of hardware, networks, software, the ethical use of computers and how businesses use IT.		Unit 2 - Global information systems: <ul style="list-style-type: none"> - Uses of information in the public domain, globally, in the cloud and across the Internet, by individuals and organisations. - How organisations use information sources both internally and externally - How individuals use information of various types. - Legislation and regulation governing information which flows in to and out of an organisation - The relationship between data and Information. 			Unit 8 - Project management (Coursework) <p>Students are learning about the;</p> <ul style="list-style-type: none"> - Product life cycle. - Project methodologies - Plan and create a project for a given scenario. 	Quizlet.com	https://www.ocr.org.uk/qualifications/gcse/computer-science-j276-from-2016/	https://www.amazon.co.uk/My-Revision-Notes-Cambridge-Technical/dp/1510442316
Year 13	Unit 8 - Project management (Coursework) <p>Students are learning about the;</p> <ul style="list-style-type: none"> - Product life cycle. - Project methodologies <p>Plan and create a project for a given scenario</p>	Unit 5 - AR & VR (Coursework) <p>Students are to research AR and VR and there effect on society and then develop their own AR app using Blippar and evaluate its success.</p>	Unit 17 - Internet of everything (Coursework) and Unit 5 - AR & VR (Coursework) <p>Students will be researching the concept of IoE and look a developing a business proposal and pitch for the</p>	Unit 17 - Internet of everything (Coursework)					

			given scenario and evaluating its success.					
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