

Subject: Computer Science

Year 7	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
What students are learning	Using computers safely, responsibly and effectively	Microbit- Physical Computing	Introduction to Flowol	Python Turtle/Basics	Python Turtle/Basics continued	Spreadsheets
Key Content and Skills	• Copyright and Ownership • Privacy and Security • Self Image and Identity • Managing online information • Health, wellbeing and lifestyle • Online Bullying • Online Relationships • Google Slides • Google Docs • Google Sheets • Google quizzes • Forms		• Solving problems with flowcharts • Sequencing • Sensors • Subroutines • Actuators TS • Variables		• Sequence, selection, iteration, variables and algorithms through python turtle programming. • Students will learn about modelling and analysing data using spreadsheets.	

Assessment	In-lesson teacher-assessed tasks. Topic quizzes and retrieval practice and key word tests End of unit test	In-lesson teacher-assessed tasks. Topic quizzes and retrieval practice and key word tests End of unit test	In-lesson teacher-assessed tasks. Topic quizzes and retrieval practice and key word tests End of unit test	In-lesson teacher-assessed tasks. Topic quizzes and retrieval practice and key word tests End of unit test	In-lesson teacher-assessed tasks. Topic quizzes and retrieval practice and key word tests End of unit test	In-lesson teacher-assessed tasks. Topic quizzes and retrieval practice and key word tests End of unit test
How can students prepare beyond the classroom?	Autumn term Students should: Complete some reading on online safety: https://www.childnet.com/young-people		Spring term Students should: - Visit Seneca learning, KS3 Computer Science, Computational Thinking, Algorithms and go through the Algorithms and Flowcharts lesson. https://app.senecalearning.com/classroom/course/b89946c5-cfe7-42d6-ae51-9b4631a07589/section/e8ce383e-88d3-4a1b-acb2-e373e54c0906/session		Summer term Students should: - Develop their skills in programming by practising on python turtle programming. Python can be used through online platform Repl it. It can also be downloaded as an app on tablet or phone to practise on the go. - This is a great website to become familiar with Python Turtle - https://realpython.com/beginners-guide-python-turtle/	

Year 8	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
What students	Understanding computers	Python introduction	Python introduction cont...	Artificial Intelligence	Computer crime and cyber security	Programming with Gamemaker

are learning						
Key Content and Skills	• Building Computers (hardware) • Input and output devices • Little man computer - machine code/assembler • Components of the CPU • Impact on performance of different components • Fetch-decode-execute cycle • Registers and von Neumann architecture		• Sequence, selection, iteration, variables and algorithms through python turtle programming. • Develop an understanding of how Artificial Intelligence works. • Students will also develop a chatbot using the concepts learnt in this unit.		• Copyright and Ownership • Privacy and Security • Self Image and Identity • Managing online information • Health, wellbeing and lifestyle • Online Bullying • Online Relationships • Students will use their problem solving and computational thinking skills to design a game using the Game maker software. It also introduces students to more challenging concepts of programming in accessible and fun ways.	
Assessment	In-lesson teacher-assessed tasks. Topic quizzes and retrieval practice and key word tests End of unit test	In-lesson teacher-assessed tasks. Topic quizzes and retrieval practice and key word tests End of unit test	In-lesson teacher-assessed tasks. Topic quizzes and retrieval practice and key word tests End of unit test	In-lesson teacher-assessed tasks. Topic quizzes and retrieval practice and key word tests End of unit test	In-lesson teacher-assessed tasks. Topic quizzes and retrieval practice and key word tests End of unit test	In-lesson teacher-assessed tasks. Topic quizzes and retrieval practice and key word tests End of unit test
How can students prepare	Students should: • Do some wider reading about the hardware components of computers. The following link is a good start:		Students should: • Visit Seneca learning, KS3 Computer Science, Computational Thinking, Algorithms and go		Students should: • Research the topic keywords • Research how to set a good password • Students should revisit the	

beyond the classroom?	http://www.teach-ict.com/gcse_new/networks/hardware/miniweb/index.htm More reading about the fetch-decode-execute cycle: http://www.teach-ict.com/gcse_computing/ocr/212_computing_hardware/cpu/miniweb/pg3.php	through the Algorithms and Flowcharts lesson. https://app.senecalearning.com/classroom/course/b89946c5-cfe7-42d6-ae51-9b4631a07589/section/e8ce383e-88d3-4a1b-acb2-e373e54c0906/session - Develop their skills in programming by practising on python turtle programming. Python can be used through online platform Repl it. It can also be downloaded as an app on tablet or phone to practise on the go. - This is a great website to become familiar with Python Turtle - https://realpython.com/beginners-guide-python-turtle/	programming concepts learnt during Autumn and Spring terms. - Develop their skills in programming by practising on python turtle programming. Python can be used through online platform Repl it. It can also be downloaded as an app on tablet or phone to practise on the go. - This is a great website to become familiar with Python Turtle - https://realpython.com/beginners-guide-python-turtle/
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Year 9	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
What students are learning	Advanced Flowol	Advanced Python	Advanced Python continued	Data Representation (Image and Sound)	Networking and system security	iDEA program (Bronze (all)/Silver)
Key Content and Skills	Flowol - Introduction and advanced skills		Use a while loop to repeat a section of code		iDEA program	

			● Use a for loop to repeat a section of code ● Store and update values in a list ● Append data to a list ● Use a for() loop to step through a list ● Using and understanding procedures ● Using and understanding functions			
Assessment	In-lesson teacher-assessed tasks.	In-lesson teacher-assessed tasks.	In-lesson teacher-assessed tasks.	In-lesson teacher-assessed tasks.	In-lesson teacher-assessed tasks.	All students to earn Bronze certificates with some students earning Silver certificates
	Topic quizzes and retrieval practice and key word tests	Topic quizzes and retrieval practice and key word tests	Topic quizzes and retrieval practice and key word tests	Topic quizzes and retrieval practice and key word tests	Topic quizzes and retrieval practice and key word tests	
	End of unit test	End of unit test	End of unit test	End of unit test	End of unit test	

How can students prepare beyond the classroom?	Students should: • Identify everyday situations where computer control is used • Identify common types of sensors used by control systems • Identify control flowchart symbols and understand how they are used to break down problems • Produce flowchart-based solutions for control systems that include sequences and loops • Explain why control systems might fail and how this might impact on safety • Produce control solutions for problems that include subroutines • Produce control solutions for problems that include variables	Students should: • The following website can be visited to read up about the topic: https://www.bbc.co.uk/bitesize/guides/zts8d2p/revision/2	Students should: • Research the meaning of these terms using the following link: https://www.bbc.co.uk/bitesize/guides/zs87sbk/revision/1 • Look at the following website to familiarise: https://idea.org.uk/
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Year 10	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
What students are learning	Boolean Logic - How computers process data. Programming language environment.	Introduction to programming Fundamentals and data types	System architecture . Plan , design and create algorithms . Learn about sorting and searching algorithms.	System architecture . Plan , design and create algorithms . Learn about sorting and searching	Advanced Programming skills Testing Robust programs	Practical programming Tasks Ethical Legal issues in computer science

				algorithms.		
Key Content and Skills	• Simple logic diagrams using the operations AND, OR and NOT • Truth tables • Combining Boolean operators using AND, OR and NOT • Applying logical operators in truth tables to solve problems • Characteristics and purpose of different levels of programming language: • o High-level languages • o Low-level languages • The purpose of translators • The characteristics of a compiler and an interpreter • Common tools and facilities available in an integrated development environment (IDE): • o Editors • o Error diagnostics • o Run-time environment • o Translators • The use of variables, constants, operators, inputs, outputs and assignments • The use of the three basic programming constructs used to control the flow of a program: • o Sequence • o Selection	Component 1: • 1.1.1 Architecture of the CPU • 1.1.2 CPU Performance • 1.1.3 Embedded systems • 1.2.1 Primary storage (Memory) • 1.2.2 Secondary storage Component 2: • 2.1.1 Computational thinking • 2.1.2 Designing, creating and refining algorithms • 2.2.1 Programming fundamentals • 1.2 Memory and storage Programming Project: • Every half term a small programming project will be completed by students, complete with documentation	Component 2: • 2.2.1 Programming fundamentals • 2.2.3 Additional programming techniques • 2.3 Producing robust programs • Practical Programming Skills			

	- o Iteration (count- and condition- controlled loops) • The common arithmetic operators • The common Boolean operators AND, OR, NOT • The use of data types: - o Integer - o Real - o Boolean - o Character and string - o Casting		
Assessment	End of topic test for each unit covered during each half term.		June PPEs
How can students prepare beyond the classroom?	Students should: • Watch Craig and Dave videos for the topics given - https://student.craigndave.org/gcse-videos • Revise programming skills especially file handling and use of different programming constructs in combination https://www.101computing.net/category/python-challenges/ website can be a good resource to challenge themselves and learn programming /problem solving. Start at beginner level	Students should: • Work through their CGP revision guide for each topic • Use the <i>Teach ICT</i> website to go over topics again that we have covered in class: http://www.teach-ict.com/2016/GCSE_Computing/OCR_J276/OCR_J276_home.html • Work through Python booklets and log on to Grok learning to practise skills in Python; • Familiarise themselves with real world scenarios involving technology. We suggest they watch episodes of: <i>The Gadget show</i>: http://www.channel5.com/show/the-gadget-show/	Students should: • Use OCR programming challenges booklet to develop independent programming skills • Code daily at home to develop Python skills • Do flipped learning of topics from CGP revision guide • Use Craig and Dave videos for flipped learning of topics

		Click http://www.bbc.co.uk/programmes/b006m9ry and also keep in touch with the RSS feed on BBC Technology website http://www.bbc.co.uk/news/technology	
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Year 11	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
What students are learning	Networks and protocols. LANs, WANs and wireless networks Revision of Year 10 topics	Network security threats and solutions Revision of Year 10 topics	Translators and IDEs. Revision of programming concepts	Revision of all components	Revision of all components	Revision of all components
Key Content and Skills	Component 1: 1.4 Wired and wireless networks 1.5 Network protocols and layers 1.6 System security Component 2: 2.3 Robust Programs		Component 1 (50% of final GCSE): - System security - Revision and exam practice of all topics covered to date Component 2 (50% of final GCSE): - Producing Robust programs - Translators and facilities of languages - Data representation -Images and Sounds - Revision and exam practice of all topics covered to date Programming Project - not assessed but useful for Paper 2: - Students should continue to practise their skills in Python (programming language)			

Assessment	End of topic test for each unit covered during the half term	November PPEs	End of topic test for each unit covered during each half term.	
How can students prepare beyond the classroom?	Students should: - Continue to revise all the topics covered and solve the exam-style questions uploaded on Google Classroom - Use PIXL revision booklets and their own notes to revise - Use CGP textbook and Teach ICT website to read through the above topics. They MUST take notes in their books (summarised) as evidence of learning		Students should: - Work through their CGP revision guide for each topic - Students can also use the <i>Teach ICT</i> website to go over topics again that we have covered in class: http://www.teach-ict.com/2016/GCSE_Computing/OCR_J276/OCR_J276_home.html - Students should be working through their Python booklets and log on to W3 Schools to practise Python programming - Students should familiarise themselves with real world scenarios involving technology. We suggest they watch episodes of: <i>The Gadget show</i>: http://www.channel5.com/show/the-gadget-show/ Click http://www.bbc.co.uk/programmes/b006m9ry and also keep in touch with the RSS feed on BBC Technology website http://www.bbc.co.uk/news/technology	Students should: Revise and prepare for exams

Year 12	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
What students are learning	Revisit GCSE Programming skills Networks Learn about the concepts of databases	NEA Elements of computational thinking	Data Structures Algorithms Software development NEA	Algorithms NEA	Data structures and programming	Data structures and programming continues
Key Content and Skills	Component 1: • Networks • Types of Programming Language • Introduction to Programming • Databases Component 2: • Programming Techniques • Elements of computational thinking. • NEA- Students will start with project Introduction		Component 1: • Structure and Function of Processor • Types of Processor • Input, Output and storage • Software Development • Data Structures Component 2: • Computational methods • Programming Techniques • Algorithms- Data Structures • NEA- Students will start with project Analysis		• 1.4.2- Data Structures • 1.4.1- Data Types • 2.2.1- Programming Techniques • 2.3.1- Algorithms	
Assessment	Settling in assessment	End of topic test for each unit covered during each half term.				June PPEs
How can	Students should:		Students should:		Students should:	

students prepare beyond the classroom?	• Complete flipped learning using PG Online book for the relevant chapters • Watch the relevant videos in Craig and Dave : https://student.craigndave.org/a-level-videos • Make notes / mindmaps / flashcards about keywords in their books • Practice programming at home using the OCR Coding challenges booklet	• Complete flipped learning using PG Online book for the relevant chapters • Watch the relevant videos in Craig and Dave : https://student.craigndave.org/a-level-videos • Make notes / mindmaps / flashcards about keywords in their books • Practice programming at home using the OCR Coding challenges booklet	• Read the textbook chapters on the topics to be covered • Complete end-of-chapter questions • Complete exams questions given to them • Complete all homework to the best of ability • Go through the Logicly website for hands-on practise of logic gates • Solving OCR Programming Tasks/Challenges • Watch Craig and Dave videos for flipped learning of topics
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Year 13	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
What students are learning	System software and software generation . Operating system Ethical legal and cultural issues in computer science Revision	Ethical legal and cultural issues in computer science NEA	NEA Revision of Algorithms Boolean algebra	NEA Revision	Revision	Revision
Key Content and Skills	Component 1: • Operating Systems • Applications Generation		Component 1: • Computing related legislation • Ethical, moral and cultural issues			

	• Systems Software • Ethical legal cultural issues Component 2: • Thinking Abstractly • Thinking Ahead • Thinking Procedurally • Students should continue working in their projects and act on feedback from the teacher		• Revision of all topics • Boolean Algebra Component 2: • Thinking Logically • Thinking Concurrently • Practice programming skills specially coding the data structures (queues, stacks , circular queues, linked lists etc) • Students should continue working in their projects and act on feedback from the teacher		
Assessment	October PPEs	End of topic test for each unit covered during this half term.	January PPEs	End of topic test for each unit covered during each half term.	
How can students prepare beyond the classroom?	Students should: • Watch Craig and Dave videos for the topics given https://student.craigndave.org/a-level-videos • Practise advanced programming skills like file handling, 2D arrays, functions and procedures. • Visit the website: https://www.101computing.net/category/python-challenges/ to practise the above skills on mini projects as given in the Python programming challenges (Intermediate)		Students should: • Complete flipped learning using PG Online book for the relevant chapters • Watch the relevant videos in Craig and Dave : https://student.craigndave.org/a-level-videos • Make notes / mindmaps / flashcards about keywords in their books • Practice programming at home using the OCR Coding challenges booklet • Complete all exam style questions given to them during the lessons		Students should: • Revise and prepare for exams

