Ruislip High School

Subject: Computer Science

Year 7	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
What students are learning	Introduction to Google workspace+ Introduction to Flowol	Using computers safely, responsibly and effectively	Microbit- Physical Computing	Spreadsheets	Python Turtle/Basics continued	Introduction logic gates
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 workspace (slides,docs, classroom) • Solving problems with flowcharts • Sequencing • Sensors • Subroutines		• Physical computing • Sequencing • Sensors • Subroutines • Variables • Students will learn about modelling and analysing data using spreadsheets.		• Sequence, selection, iteration, variables and algorithms through python turtle programming. • Introduction to logic gates AND,OR,NOT . • Introduction to how computers use logic gates.	

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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 are learning	Understanding computers	Python introduction	Python introduction	Website Design	Artificial Intelligence	Computer crime and cyber security
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 • Introduction to Python		• Use Google sites to help understand the principles of website design. • Create and develop a website based on those principles. • Sequence, selection, iteration, variables and algorithms through python programming		• Copyright and Ownership • Privacy and Security • Self Image and Identity • Managing online information • Health, wellbeing and lifestyle • Online Bullying • Online Relationships • Develop an understanding of how Artificial Intelligence works. • Students will also develop a chatbot using the concepts learnt in this unit.	
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 should: • Do wider reading about the hardware		Students should: • Visit Seneca learning, KS3 Computer		Students should: • Research the topic keywords	

students prepare beyond the classroom?	components of computers. The following link is a good start: 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	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 • 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/	• Research how to set a good password • Students should revisit the 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/

Year 9	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
What students are learning	Computational Thinking	Advanced Python	Advanced Python	Ethical , legal , cultural impacts	Data Representation (Image and Sound)	iDEA program (Bronze (all)/Silver)
Key Content and Skills	• Introductions to Flowcharts and pseudocodes. • Use a while loop to repeat a section of		• Use a while loop to repeat a section of code • Use a for loop to repeat a section of		• Learn about the laws governing computers and its use. • Learn the ethical, moral and cultural	

	code ● 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		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		impacts of using computers . ● iDEA program ● Learn how data like images and sound is represented by computers .	
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	All students to earn Bronze certificates with some students earning Silver certificates

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/

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 algorithms	Advanced Programming skills Networks and protocols. LANs, WANs and wireless networks	Practical programming Tasks Network security threats and solutions

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 • o Iteration (count- and condition-controlled loops)	**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 • 1.4 Wired and wireless networks • 1.5 Network protocols and layers • 1.6 System security • Practical Programming Skills

	• 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 *Teach ICT* 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: *The Gadget show:* http://www.channel5.com/show/the-gadget-show/ *Click* *http://www.bbc.co.uk/programmes/b*	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

		006m9ry and also keep in touch with the RSS feed on BBC Technology website http://www.bbc.co.uk/news/technology	

Year 11	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
What students are learning	Testing Robust programs Revision of Year 10 topics	Ethical Legal issues in computer science 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:** ● Ethical , legal and cultural issues in computer science. ● Laws in computer science ● Essay type questions in computer science **Component 2:** ● 2.3 Robust Programs		**Component 1 (50% of final GCSE):** ● 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	November PPEs	End of topic test for each unit covered during each half term.			

	each unit covered during the 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 *Teach ICT* 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: *The Gadget show:* 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 Learn about data structures , computing legislations and boolean algebra.	NEA - Students will start looking and thinking about their A level projects Elements of computational thinking	Students will be introduced to the software development cycle which will help them with their A level project. Students will also learn about compression techniques, databases and types of programming languages	Students will continue on practicing their previous units and learn about computer legislation. They will continue developing their essay writing skills.They will also learn about databases and system software	Students will learn about networks and web technologies.	Continue programming practice and earlier units
Key Content and Skills	**Component 1:** ● Boolean Algebra ● Data Types ● Data Structures ● Computing related legislation **Component 2:** ● Algorithms ● Programming techniques ● NEA- Students will start with project Introduction		**Component 1:** ● Types of programming languages ● Databases ● Computer Legislation ● Compression, encryption and hashing ● System software ● Software development **Component 2:** ● Programming techniques ● NEA- Students will start with project Analysis		**Component 1:** ● Web technologies ● Networks ● Computer Legislation **Component 2:** ● Programming techniques ● NEA- Students will start with project design	

Assessment	Settling in assessment	End of topic test for each unit covered during each half term.				June PPEs
How can students prepare beyond the classroom?	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	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		Students should: ● 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		

Year 13	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
What students are learning	Application generation Operating system Structure and function of a processor Types of processor Input , output and	Elements of computational thinking NEA	NEA Revision of Algorithms	NEA Revision	Revision	Revision

	storage devices Revision					
Key Content and Skills	**Component 1:** ● Operating Systems ● Applications Generation ● Structure and function of a processor ● Types of processors ● Input,output and storage devices. ● 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		**Component 1:** ● Computing related legislation ● Ethical, moral and cultural issues ● Revision of all topics **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	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		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		Students should: ● Revise and prepare for exams	

classroom?	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)	• 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	