



Subject: Computer Science

Overarching Topic 1: How do we communicate safely using technology?

Why is this topic being studied at this time?
Model world systems -Just as we give every student the opportunity to learn the workings of physics, chemistry and biology, because they live in a physical, chemical and biological world. So we should offer every student the opportunity to learn the workings of the digital systems of our modern world and for your son the systems of his modern school.
How does it fit into the wider subject curriculum?
This will allow your son to adapt and thrive across all subjects @RWS in the digital environment that is available to him.

	Critical	Core	Pinnacle
The Big Questions (What questions will students be able to answer upon mastery of the topic?)	Can you access Office 365? Can you ensure that all applications at home are only worked on in an Internet browser? Do you know how to keep yourself whilst on-line?	How can you use the Internet in the most efficient way? Do you know how to spot fake news?	Can you use Office 365 across the whole school? Do you know how to abide by the law when using information found on the Internet?

The Key Skills/ Techniques	The sophistication and application of skills will become more advanced as students' progress through the critical, core and pinnacle knowledge.		
	Skill/Technique	How will this skill be developed?	
	Ability to access the RWS Office 365 Suite	Students will be instructed how to download/access the RWS Office 365 Suite and taken through a series of demonstration and practical lessons in how to make best use of the digital system RWS provides.	
	Ability to protect themselves online and evaluate information they see in our digital world	Students will be shown how to protect themselves and what to do if they need help. They will also undertake a task to enhance their understanding of the potential dangers of the Internet.	

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Overarching Topic 2: Computational thinking			
<p>Why is this topic being studied at this time?</p> <p>How does it fit into the wider subject curriculum?</p>	<p>Decisions, decisions. All humans make decisions, the pursuit of the ideal solution has plagued humanity since time began.</p> <p>Computer Scientists learn by experience. We learn by seeing others solve problems and by solving problems by ourselves. Being exposed to different problem-solving techniques and by seeing how other algorithms are designed helps us to take on the next challenging problem that we are given.</p> <p>Throughout your son's time at RWS, they will be presented with many problems, the skills that will be presented in this topic will prepare them to face and overcome them.</p>		
	Critical	Core	Pinnacle
<p>The Big Questions (What questions will students be able to answer upon mastery of the topic?)</p>	<p>What is an algorithm? What does abstraction mean? What does decomposition mean? Why do we need algorithms? Where do we use algorithms in daily life?</p>	<p>How can I break down problems to enhance problem solving? How do computers make decisions within their programming?</p>	<p>How are the pillars of computational thinking used in your possible future careers?</p>
<p>The Key Skills/ Techniques</p>	<p>The sophistication and application of skills will become more advanced as students' progress through the critical, core and pinnacle knowledge.</p>		
	Skill/Technique	How will this skill be developed?	
	Enhanced vocabulary	Key vocabulary will be provided during the lessons beginning their journey into the realms of Computer Science. The same vocabulary is used throughout the subject right up until A-level.	
	Computational thinking	Students will use real-life examples such as mobile phones, maps, to recognise and understand the purpose and application of decomposition and abstraction.	

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Overarching Topic 3: Hardware and Software of Computers – How do our devices work?			
<p>Why is this topic being studied at this time?</p> <p>How does it fit into the wider subject curriculum?</p>	<p>From input to output - As your son lives and breathes in the natural world, he will be interacting with Hardware and Software in our ever-growing digital world.</p> <p>All digital systems used have an input, process and output (Biometric payment, Oyster fare system, etc.) that we will prepare your son to interact, overcome and benefit from in his everyday life both at RWS and at home.</p>		
	Critical	Core	Pinnacle
<p>The Big Questions (What questions will students be able to answer upon mastery of the topic?)</p>	<p>What is Hardware and Software?</p> <p>What is a computer?</p> <p>Identify the meaning of input and output with an example.</p>	<p>What is the difference between hardware and software?</p> <p>Can I distinguish between input, process and output</p> <p>Can I identify specific computer components and their purpose for a given scenario?</p>	<p>How does hardware work with software? (files/folders)</p> <p>Do you understand how different systems inter-relate?</p> <p>When did convergence happen?</p>
<p>The Key Skills/Techniques</p>	<p>The sophistication and application of skills will become more advanced as students' progress through the critical, core and pinnacle knowledge.</p>		
	Skill/Technique	How will this skill be developed?	
	<p>Identification of software categories</p> <p>Identification of hardware components</p>	<p>Exemplar devices will be shown to students picking apart the device and demonstrating the individual use of each component.</p>	
	<p>Analysis of inter-relating systems of hardware and software.</p>	<p>Students will follow the journey of a program becoming usable. Be it an app on their phone or an internet browser on a computer.</p>	

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Overarching Topic 4: Flowcharts and Task design. How do we design our programs together?			
Why is this topic being studied at this time? How does it fit into the wider subject curriculum?	It's impossible! We've all faced problems that initially believed were either impossible to solve or would take the rest of our lives to champion. All problems no matter how large or small can be broken down and simplified to produce a manageable and accessible solution. The two techniques we will be instilling upon your son will be Decomposition and Abstraction making use of flowcharts. Decomposition, also known as factoring is breaking a complex problem or system into parts that are easier to conceive, understand, develop and maintain. Abstraction, reduces and factors out details, so that your son can focus on a few concepts at a time.		
	Critical	Core	Pinnacle
The Big Questions (What questions will students be able to answer upon mastery of the topic?)	What is a flowchart? What are the key flowchart symbols? What does each symbol represent?	How can we visually approach a task? How can I apply my knowledge to a given scenario?	How do teams work collaboratively to produce programs? How do flowcharts help with collaborative working?
The Key Skills/ Techniques	The sophistication and application of skills will become more advanced as students' progress through the critical, core and pinnacle knowledge.		
	Skill/Technique	How will this skill be developed?	
	Creativity	Students will create a diagrammatic representation of a decomposed problem to show a workable solution. Students will continually use the same key symbols enabling recall.	
	Evaluation	Students will evaluate their own and others work to establish the effectiveness of their solution.	

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Overarching Topic 3: Your first programming language – Python, putting it all together.

<p>Why is this topic being studied at this time?</p> <p>How does it fit into the wider subject curriculum?</p>	<p>Know the code! In a world that is being taken over by the ever encroaching dominance of the coded language. Our students need to become fluent in this language to prepare them for this changing world.</p> <p>Students will be prepared through use of the practical and theoretical aspects of a coded language. This will be broken down into solving logical problems which can be applied to all walks of life.</p>		
	Critical	Core	Pinnacle
<p>The Big Questions (What questions will students be able to answer upon mastery of the topic?)</p>	<p>Can I access Python through an online system? What is syntax?</p>	<p>Where is Python used? How is the syntax of the language structured? Can I use sequence, selection and iteration in a program?</p>	<p>Can I read and understand the purpose of a program? Can I identify and correct errors in code?</p>
<p>The Key Skills/ Techniques</p>	<p>The sophistication and application of skills will become more advanced as students' progress through the critical, core and pinnacle knowledge.</p>		
	Skill/Technique	How will this skill be developed?	
	Use of correct Python Syntax	This will be developed through interactive lesson tutorials using the collaborative coding websites Trinket.io and Repl.it	
	Ability to debug programs	Students will be taken through a series of common errors seen in programming and then through increasingly challenging exemplars, build up the experience of debugging real life programs.	