



Subject: Computer Science

Overarching Topic 1: Building better programs

<p>Why is this topic being studied at this time?</p> <p>How does it fit into the wider subject curriculum?</p>	<p>With technology moving at a rapid pace, there is a need for future generations to become more aware of how to become effective users of programs and programmers themselves.</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, building on the skills learnt in the previous topic of algorithms in year 7 and transferring these into working programs.</p>
----------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

	Essential	Core	Ambitious
--	------------------	-------------	------------------

The Big Questions (What questions will students be able to answer upon mastery of the topic?)	<p>What is syntax?</p> <p>How do flowcharts translate to a working program?</p>	<p>Can I use sequence, selection and iteration in a program?</p> <p>Can I write programs that work efficiently?</p>	<p>Can I read and understand the purpose of a program?</p> <p>Can I explain using terminology what a program is doing?</p>
---------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------

The Key Skills/ Techniques	The sophistication and application of skills will become more advanced as students' progress through the essential, core and ambitious knowledge		
	Skill/Technique	How will this skill be developed?	
	Understanding structure of programs	Students will use a block-based program to understand the structure of programs to provide a firm base knowledge to move forward through their KS3 programming experience.	
	Computational thinking	Students will bring together the skills learnt earlier in the year to produce working programs based on problem solving and computational thinking.	

Subject: Computer Science

Overarching Topic 2: Website Design			
<p>Why is this topic being studied at this time?</p> <p>How does it fit into the wider subject curriculum?</p>	<p>How many times do you access a website and cannot locate what you actually need? Are advertisements annoying or relevant? What makes you want to use that company's website again and again?</p> <p>A website should be able to accomplish one thing: to provide the basic information to the user, with what they want and when they want it. Your son will understand how websites can be created to achieve just that, whilst understanding the impacts of website design on both individuals and organisations. This links to the wider curriculum of Art, Graphic Design and Business Studies providing a range of opportunities to employ knowledge to other subjects.</p>		
	Essential	Core	Ambitious
<p>The Big Questions (What questions will students be able to answer upon mastery of the topic?)</p>	<p>How do websites work?</p> <p>What is HTML?</p>	<p>How can I use HTML to structure components of a website?</p> <p>How can I create my own website?</p>	<p>What are the benefits to companies of using websites?</p> <p>What makes a good website design?</p>
<p>The Key Skills/ Techniques</p>	<p>The sophistication and application of skills will become more advanced as students' progress through the essential, core and ambitious knowledge</p>		
	<p>Skill/Technique</p>	<p>How will this skill be developed?</p>	
	<p>Understand how CSS and HTML affect websites</p>	<p>Students will understand how various components are incorporated into websites can be combined to achieve challenging goals, including meeting the needs of known users.</p>	
	<p>Effective website design</p>	<p>Students will evaluate existing websites for effective design based upon the key fundamentals of good practice. They will then use this, along with their knowledge of HTML and CSS, to create a template to design their own multi-page website with a consistent look and feel.</p>	

Subject: Computer Science

Overarching Topic 3: Cyber Crime and Security			
Why is this topic being studied at this time?	Ransomware, beware! Cybercrime continues to rise in scale and complexity, affecting essential services, businesses and private individuals alike. Cybercrime costs the UK billions of pounds, causes untold damage, and threatens national security. That isn't us stating this, the National Crime Agency take this matter as one of their top priorities.		
How does it fit into the wider subject curriculum?	Your son is now, with their smartphone, laptop, console or other electronic devices, going to be exposed to these ever-increasing threats. We will, through this unit, get them to better understand the threats from Cybercrime and how they can prevent/counter them.		
	Throughout your son's time at RWS they will be using the digital world to access the information they need to grow intellectually. They need to understand that our digital devices need to be respected and in doing so create a safe learning environment.		
	Essential	Core	Ambitious
The Big Questions (What questions will students be able to answer upon mastery of the topic?)	What does a typical scam email look like? What does hacking actually mean? How can I protect myself from electronic scams?	Why do people try to attack systems? What does the law say about illegal activity and protecting data?	What are the ethical considerations of people involved in cybercrime?
The Key Skills/ Techniques	The sophistication and application of skills will become more advanced as students' progress through the essential, core and ambitious knowledge		
	Skill/Technique	How will this skill be developed?	
	Recognising Email Scams	Breaking down typical email hacking types into several key areas, showing why they are used and what the reason was for their use. Then showing exemplars of emails with obvious identifiers for the scam and slowly removing the obvious nature of the identifiers and allowing students to decipher real email scams.	
	Able to distinguish between different types of hacking	Students will be taken through the de facto legislation that defines what hacking is. They will be encouraged to share the thoughts on their views and undertake a variety of activities to make informed decisions.	

Subject: Computer Science

Overarching Topic 4: Cryptography			
<p>Why is this topic being studied at this time?</p> <p>How does it fit into the wider subject curriculum?</p>	<p>Is your data secure? Cryptography dates back to ancient times, where our ancestors needed to send secret messages, like Caesar did to expand his Roman Empire. In modern times, we honour Alan Turing as the forefather of cryptography, as we pay homage to him breaking the famous Enigma code during WW2 at Bletchley Park. Mathematics and Computer Science collide beautifully when cryptography is studied, and students will enjoy making links between these two subjects as well as honing their investigative and problem-solving skills in cracking codes. In modern times, cryptography and encryption is the new buzzword, as GCHQ are actively recruiting for the next generation of cyber security experts who know how to use code to create the strongest ciphers Mankind has known, using the immense power of our supercomputers.</p> <p>Living in the digital age means that we need cryptography more than ever to combat security vulnerabilities online and at home. Students will be well versed in the currency of the future when they study about this exciting part of Computer Science that is only going to grow as we proceed into uncharted territory with computers.</p>		
	Essential	Core	Ambitious
<p>The Big Questions (What questions will students be able to answer upon mastery of the topic?)</p>	<p>What does cryptography mean? Where does cryptography originate from? (Caesar Cipher)</p>	<p>How did the introduction of technology change the way we encrypt messages? What are the types of encryptions are used in today's technology world? How does encryption protect us?</p>	<p>How can encryption work alongside other types of security? Should companies/organisations do more to protect their customers?</p>
<p>The Key Skills/ Techniques</p>	<p>The sophistication and application of skills will become more advanced as students' progress through the essential, core and ambitious knowledge</p>		
	<p>Skill/Technique</p>	<p>How will this skill be developed?</p>	
	<p>Understand encryption and decryption</p>	<p>This skill will be developed through initial use of key vocabulary and enhanced by students encrypting and decrypting a range of messages.</p>	
<p>Encrypting and Decrypting using a Caesar cipher.</p>	<p>Students will be initially shown the process of a Caesar cipher through historical context and then basic shift messages, to the point of being able to translate specific words knowing the shift key. Students will then be shown heuristic methods for deciphering longer messages to look for key syntax correlations with the English languages within the encrypted text.</p>		

Subject: Computer Science

Overarching Topic 5: From blocks to text

<p>Why is this topic being studied at this time?</p> <p>How does it fit into the wider subject curriculum?</p>	<p>Hello World! Building upon the skills learnt earlier in their Computer Science journey, students will now face the prospect of moving from block-based programming into text-based programming. They will use their programs to solve practical problems and gain the base knowledge of a programming language used in industries around the world.</p> <p>This fits into our wider curriculum for Mathematics, Geography and the Sciences. In that, students will be able to utilise Python for what it is used most for worldwide, data analysis and Mathematical calculations.</p>
----------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

	Essential	Core	Ambitious
--	------------------	-------------	------------------

<p>The Big Questions (What questions will students be able to answer upon mastery of the topic?)</p>	<p>What are the key data types used within programming?</p> <p>What do we mean by a sequence, selection and iteration?</p>	<p>Why do we need to convert between data types?</p> <p>How do I control the flow of programs?</p>	<p>How can I create working program for a given scenario using a variety of programming fundamentals?</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>		
	<p>Skill/Technique</p>	<p>How will this skill be developed?</p>	
	<p>Applying techniques to control the flow of a program</p>	<p>Students will convert between block-based programming, learnt earlier in their journey, into a text-based programming environment. They will convert using the correct syntax for sequence, selection and iteration in a high-level language programming environment.</p>	
<p>Recall programming terminology</p>	<p>Key terminology learnt within the block-based programming module will be re-used in their high-level programming environment.</p>		