Ravens Wood School

KS3 Curriculum Plan

Subject: Computer Science

Overarching Topic 1: My Digital World			
Why is this topic being studied at this time? How does it fit into the wider subject curriculum?	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. This will allow your son to adapt and thrive across all subjects @RWS in the digital environment that is available to him.		
	Essential	**Core**	**Ambitious**
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 safe 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 essential, core and ambitious 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			
Why is this topic being studied at this time? How does it fit into the wider subject curriculum?	Decisions, decisions. All humans make decisions; the pursuit of the ideal solution has plagued humanity since time began. 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 seeing how other algorithms are designed helps us to take on the next challenging problem that we are given. 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.		
	Essential	**Core**	**Ambitious**
The Big Questions (What questions will students be able to answer upon mastery of the topic?)	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? How can I break down problems to enhance problem solving? How do computers make decisions within their programming?	How is computational thinking used in your possible future careers?
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?**	
	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: 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 to demonstrate the skills learnt in the computational thinking topic.		
	Essential	**Core**	**Ambitious**
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?	How can we visually approach a task? How can I apply my knowledge to a given scenario?	How can flowcharts link to computational thinking? How can I use computational thinking models with my flowcharts?
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?**	
	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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<table>
<tr><td colspan="4">Overarching Topic 4: Your first programming language – building blocks to programming</td></tr>
<tr><td>Why is this topic being studied at this time?

How does it fit into the wider subject curriculum?</td><td colspan="3">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.

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 and transferring these into working programs.</td></tr>
<tr><td></td><td>Essential</td><td>Core</td><td>Ambitious</td></tr>
<tr><td>The Big Questions
(What questions will students be able to answer upon mastery of the topic?)</td><td>What is syntax?

How do flowcharts translate to a working program?</td><td>Can I use sequence, selection and iteration in a program?

Can I write programs that work efficiently?</td><td>Can I read and understand the purpose of a program?

Can I explain using terminology what a program is doing?</td></tr>
<tr><td rowspan="3">Key Skills/ Techniques</td><td colspan="3">The sophistication and application of skills will become more advanced as students’ progress through the essential, core and ambitious knowledge</td></tr>
<tr><td>Skill/Technique</td><td colspan="2">How will this skill be developed?</td></tr>
<tr><td>Understanding structure of programs</td><td colspan="2">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.</td></tr>
<tr><td></td><td>Computational thinking</td><td colspan="2">Students will bring together the skills learnt earlier in the year to produce working programs based on problem solving and computational thinking.</td></tr>
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Overarching Topic 5: How do our devices work?			
Why is this topic being studied at this time? How does it fit into the wider subject curriculum?	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. 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.		
	Essential	**Core**	**Ambitious**
The Big Questions (What questions will students be able to answer upon mastery of the topic?)	What is Hardware and Software? What is an example of input and output? What are the three main logic gates? What is binary?	What is the difference between hardware and software? How can I convert between denary and binary?	Can I calculate the output for multiple logic circuits based on a set of inputs? What are the future possibilities for technology?
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?**	
	Identification of software categories and hardware components	Exemplar devices will be shown to students picking apart the device and demonstrating the individual use of each component.	
	Understanding logic	Students will investigate the use of logic gates in computer systems to create electronic circuits.	