

# Curriculum Overview – Year 9 Computer Science

Unit Title	Learning	How can parents best support?
<p><b>TERM ONE</b></p> <p><b>HTML</b></p> <p>Programming concepts. Algorithms, Flowcharts and Pseudocode</p>	<ul style="list-style-type: none"> <li>• Understand that tags have different effects on text and be able to identify tags that have these effects.</li> <li>• Use the tags to mark-up a document to specific requirements.</li> <li>• HTML &lt;html&gt;, Head &lt;head&gt;, Title &lt;title&gt;, Body &lt;body&gt;, Headings &lt;h1&gt; - &lt;h6&gt;, Paragraph &lt;p&gt;, Italic &lt;i&gt;, Bold &lt;b&gt;, Centre align &lt;center&gt;, Anchor &lt;a href="URL"&gt;, Unordered List &lt;ul&gt;, List Item &lt;li&gt;, Blockquote &lt;blockquote&gt;, Horizontal Rule &lt;hr&gt;, Image &lt;img&gt;</li> <li>• Use common methods of defining algorithms, including pseudocode and flowcharts.</li> <li>• Identify, explain and use subroutines in algorithms and programs.</li> <li>• Identify, explain and use sequence, selection and iteration in algorithms and programs.</li> <li>• Identify, explain and use counts and rogue values in algorithms and programs.</li> </ul>	<p>Allow students to use the free software provided by Microsoft 'Notepad' to practice typing HTML code using various tags learnt both in lesson and W3 schools online.</p> <p>Students can download an app called SoloLearn. SoloLearn is the a popular app used to to learn C++, Java, Python, SQL, CSS, HTML, C#, and many other languages for free.</p> <p>At first, you must go through the 1st lesson. Once you complete this chapter, the app will display a series of question to test your knowledge. If you don't score well in this test, go through the chapter once again.</p> <p>Providing students with scenarios to create a set of instructions using flowcharts and/or pseudocode. Various examples: making a cup of tea, getting ready for school, logging onto a computer using a username and password.</p> <p><a href="http://www.schooltube.com/video/d4b724178f5b49dabc5f/Algorithms%20in%20pseudocode%20and%20flow%20diagrams">http://www.schooltube.com/video/d4b724178f5b49dabc5f/Algorithms%20in%20pseudocode%20and%20flow%20diagrams</a> – Video presented by Clive Beale of the Raspberry Pi Foundation, looks at good practice in the techniques of writing pseudocode and producing flowcharts.</p>

<p>Introduction to Java Programming using Greenfoot</p>	<p>Design, write, test and refine Java programs within the Greenfoot environment, using the following skills:</p> <ul style="list-style-type: none"> <li>● Create new and extend existing classes</li> <li>● Create new and edit existing objects</li> <li>● Create new and edit existing worlds</li> <li>● Write and invoke methods</li> <li>● Change existing methods</li> <li>● Create new and edit existing properties (including public, private, static, etc.)</li> <li>● Add and remove objects from worlds</li> <li>● Use actors</li> <li>● Move objects around a world</li> <li>● Keyboard input</li> <li>● Add and play sounds</li> <li>● Implement and use parameter passing (by value and by reference)</li> </ul>	<p>Students can use <a href="http://www.codecademy.com">www.codecademy.com</a> to study the Java programming project from home - students can refine their Java programming skills to strengthen knowledge from lessons and further develop skills that are vital for the practical exam paper 2. Example: <a href="https://www.codecademy.com/learn/learn-java">https://www.codecademy.com/learn/learn-java</a></p> <p>Students can download an app called SoloLearn. SoloLearn is the a popular app used to to learn C++, Java, Python, SQL, CSS, HTML, C#, and many other languages for free. At first, you must go through the 1st lesson. Once you complete this chapter, the app will display a series of question to test your knowledge. If you don't score well in this test, go through the chapter once again.</p>
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TERM TWO		
Computer Hardware	<ul style="list-style-type: none"> <li>Describe the characteristics of CPU architecture, including Von Neumann architectures.</li> </ul>	<p>A range of past papers for theory paper 1 are available to download and use from <a href="https://www.wjec.co.uk/qualifications/qualification-resources.html?subject=ComputerScience&amp;level=GCSE&amp;pastpaper=true">https://www.wjec.co.uk/qualifications/qualification-resources.html?subject=ComputerScience&amp;level=GCSE&amp;pastpaper=true</a></p> <p>&amp;</p> <p><a href="https://www.wjec.co.uk/qualifications/qualification-resources.html?subject=ComputerScience&amp;level=gcsefrom2017&amp;pastpaper=true">https://www.wjec.co.uk/qualifications/qualification-resources.html?subject=ComputerScience&amp;level=gcsefrom2017&amp;pastpaper=true</a></p> <p>Term two focuses on paper 1 so students would benefit from practising past paper questions outside of lesson as extra support.</p> <p>This would support all of the topics learnt in term two.</p>
The CPU	<ul style="list-style-type: none"> <li>Identify and explain the role of the components of the CPU in the fetch-decode-execute cycle.</li> <li>Explain how performance is affected by the cache size, clock speed and number of cores.</li> <li>Explain the difference between RISC and CISC types of processors.</li> </ul>	
Input and Output Devices	<ul style="list-style-type: none"> <li>Describe the use and characteristics of input and output devices.</li> </ul>	
Primary Storage	<ul style="list-style-type: none"> <li>Explain the functional characteristics of Random Access Memory (RAM), Read Only Memory (ROM), flash memory and cache memory.</li> </ul>	
Secondary Storage	<ul style="list-style-type: none"> <li>Describe the characteristics of contemporary secondary storage technologies including magnetic, optical and solid state.</li> </ul>	

<p><b>HTML &amp; GREENFOOT RECAP</b></p> <p>Storage requirements</p> <p>Additional hardware components</p> <p>Embedded Systems</p> <p>Logical operators</p>	<ul style="list-style-type: none"> <li>• Explain the functional characteristics of contemporary secondary storage devices in terms of suitability, durability, portability and speed.</li> <li>• Use HTML tags to mark-up a document to specific requirements.</li> <li>• Design, write, test and refine Java programs within the Greenfoot environment.</li> <li>• Describe the relationship between data storage units, including bit, nibble, byte, kilobyte and additional prefix multipliers.</li> <li>• Describe data capacity and calculate data capacity requirements.</li> <li>• Describe the characteristics and role of additional hardware, including GPU, sound cards and motherboards.</li> <li>• Describe the use and give examples of embedded systems.</li> <li>• Use AND, OR, NOT and XOR logical operators, combinations of these, and their application in</li> </ul>	
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<p><b>TERM THREE</b> Boolean Algebra</p> <p>Networks</p>	<p>appropriate truth tables to solve problems.</p> <ul style="list-style-type: none"> <li>• Simplify Boolean expressions using Boolean identities and rules.</li> <li>• Explain the characteristics of networks and the importance of different network types, including LAN and WAN.</li> <li>• Describe the importance of common network topologies, including ring, star, bus and mesh, and their advantages and disadvantages.</li> <li>• Explain the importance of connectivity, both wired and wireless.</li> <li>• Explain and give advantages and disadvantages of circuit switching and packet switching.</li> <li>• Explain the importance and the use of a range of contemporary network protocols, including Ethernet, Wi-Fi, TCP/IP, HTTP, HTTPS, FTP and email protocols.</li> </ul>	<p>A range of past papers for theory paper 1 are available to download and use from <a href="https://www.wjec.co.uk/qualifications/qualification-resources.html?subject=ComputerScience&amp;level=GCSE&amp;pastpaper=true">https://www.wjec.co.uk/qualifications/qualification-resources.html?subject=ComputerScience&amp;level=GCSE&amp;pastpaper=true</a></p> <p>&amp;</p> <p><a href="https://www.wjec.co.uk/qualifications/qualification-resources.html?subject=ComputerScience&amp;level=gcsefrom2017&amp;pastpaper=true">https://www.wjec.co.uk/qualifications/qualification-resources.html?subject=ComputerScience&amp;level=gcsefrom2017&amp;pastpaper=true</a></p> <p>This would support Boolean algebra &amp; networks learnt in term three.</p>
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<p style="text-align: center;"><b>HTML RECAP</b></p> <p style="text-align: center;"><b>Java programming using Greenfoot - RECAP</b></p>	<ul style="list-style-type: none"> <li>• Describe the typical contents of a TCP/IP packet.</li> <li>• Explain the importance of layers and the TCP/IP 5-layer model.</li> <li>• Use HTML tags to mark-up a document to specific requirements.</li> </ul> <p>Design, write, test and refine Java programs within the Greenfoot environment, using the following skills:</p> <ul style="list-style-type: none"> <li>• Create new and extend existing classes</li> <li>• Create new and edit existing objects</li> <li>• Create new and edit existing worlds</li> <li>• Write and invoke methods</li> <li>• Change existing methods</li> <li>• Create new and edit existing properties (including</li> <li>• public, private, static, etc.)</li> <li>• Add and remove objects from worlds</li> <li>• Use actors</li> <li>• Move objects around a world</li> <li>• Keyboard input</li> <li>• Add and play sounds</li> <li>• Implement and use parameter passing (by value and by reference)</li> </ul>	<p>Students can download an app called SoloLearn. SoloLearn is the a popular app used to to learn C++, Java, Python, SQL, CSS, HTML, C#, and many other languages for free. At first, you must go through the 1st lesson. Once you complete this chapter, the app will display a series of question to test your knowledge. If you don't score well in this test, go through the chapter once again.</p> <p>Students can continue to use <a href="http://www.codecademy.com">www.codecademy.com</a> to study the Java programming project from home - students can refine their Java programming skills to strengthen knowledge from lessons and further develop skills that are vital for the practical exam paper 2. One example: <a href="https://www.codecademy.com/learn/learn-java">https://www.codecademy.com/learn/learn-java</a></p>
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<p>Programming concepts - Python Skills</p>	<ul style="list-style-type: none"> <li>● Use common methods of defining algorithms, including pseudocode and flowcharts.</li> <li>● Identify, explain and use subroutines in algorithms and programs.</li> <li>● Identify, explain and use sequence, selection and iteration in algorithms and programs.</li> <li>● Identify, explain and use counts and rogue values in algorithms and programs.</li> </ul>	<p>Students can use <a href="http://www.codecademy.com">www.codecademy.com</a> to study the Python programming project from home - students can refine their Python programming skills to strengthen knowledge from lessons and further develop skills that are vital for the practical exam paper 2.</p> <p>Examples of courses: <a href="https://www.codecademy.com/learn/learn-python">https://www.codecademy.com/learn/learn-python</a></p> <p>Students can download an app called SoloLearn. SoloLearn is the a popular app used to to learn C++, Java, Python, SQL, CSS, HTML, C#, and many other languages for free.</p> <p>At first, you must go through the 1st lesson. Once you complete this chapter, the app will display a series of question to test your knowledge. If you don't score well in this test, go through the chapter once again.</p>
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**HTML & Greenfoot taught in term 1 and then recapped in term 2 & 3.**

**Tracking assessment based on theory topics learnt so far & practical HTML & Greenfoot task**