

# Curriculum Overview – Year 10 Computer Science

Unit Title	Learning	How can parents best support?
<p><b>TERM ONE</b></p> <p>HTML</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> </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>Operating Systems</p>	<ul style="list-style-type: none"> <li>Students will learn the purpose and functionality of the operating system in managing resources, including peripherals, processes, memory and backing store.</li> <li>Purpose and functionality of the operating system in providing a user interface.</li> <li>Explain the purpose and functionality of a range of utility software.</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>Communication</p> <p><b>HTML &amp; GREENFOOT RECAP</b></p>	<ul style="list-style-type: none"> <li>• Explain the characteristics of networks and the importance of different network types, including LAN and WAN.</li> <li>• The importance of common network topologies, including ring, star, bus and mesh, and their advantages and disadvantages.</li> <li>• The importance of wired and wireless connectivity.</li> <li>• Analysing the advantages and disadvantages of circuit switching and packet switching.</li> <li>• Evaluate 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> <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> </ul> <ul style="list-style-type: none"> <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> </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>
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<b>TERM TWO</b>		
<p>Security and Data Management</p>	<ul style="list-style-type: none"> <li>• Describe the dangers that can arise from the use of computers to store personal data.</li> <li>• Describe methods that protect the security of data including access levels, suitable passwords for access and encryption techniques.</li> <li>• Explain the need for file backups and generations of files.</li> <li>• Explain the need for archiving files.</li> <li>• Explain how lossy and lossless data compression algorithms are used.</li> <li>• Calculate compression ratios.</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>Ethical &amp; Legal issues</p>	<ul style="list-style-type: none"> <li>• Describe the ethical impacts of digital technology, including issues of privacy.</li> <li>• Explain the importance of conforming to professional standards, including formal and informal codes of ethical behaviour.</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>

Legislation	<ul style="list-style-type: none"> <li>• Explain how relevant current legislation impacts on security, privacy, data protection and freedom of information.</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>
Environmental issues	<ul style="list-style-type: none"> <li>• Describe the environmental impacts of digital technology on wider society.</li> </ul>	
Data security	<ul style="list-style-type: none"> <li>• Describe the dangers that can arise from the use of computers to store personal data.</li> <li>• Describe methods that protect the security of data including access levels, suitable passwords for access and encryption techniques.</li> </ul>	
Data management	<ul style="list-style-type: none"> <li>• Explain the need for file backups and generations of files. Explain the need for archiving files.</li> </ul>	
Compression	<ul style="list-style-type: none"> <li>• Explain how lossy and lossless data compression algorithms are used. Calculate compression ratios.</li> </ul>	
Network security	<ul style="list-style-type: none"> <li>• Recognise the importance of network security and describe</li> </ul>	

<p>Cybersecurity</p>	<p>knowledge of network security, including the dangers that can arise from the use of networks.</p> <ul style="list-style-type: none"> <li>• Explain the purpose and typical contents of an acceptable use policy and disaster recovery policy.</li> <li>• Describe the characteristics and explain the methods of protection against malware, including viruses, worms and key loggers.</li> <li>• Describe the different forms of attack based on technical weaknesses and/or user behaviour.</li> <li>• Technical weakness: <ul style="list-style-type: none"> <li>• Infection by any of the programs above.</li> <li>• SQL injection</li> <li>• DoS attack</li> <li>• Password-based attack</li> <li>• IP address spoofing</li> </ul> </li> <li>• User behaviour <ul style="list-style-type: none"> <li>• Social engineering</li> </ul> </li> <li>• Phishing</li> <li>• Describe methods of identifying vulnerabilities:</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>
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HTML & GREENFOOT RECAP

- Foot printing: Interrogating resources on the internet for information about systems, looking to discover what a potential attacker can also discover without an organisation's knowledge (can remove 'enticements' or 'low hanging fruit' by this method).
- Penetration testing: Attempting to penetrate a system's security layers in order to demonstrate security risks.
- Explain different ways of protecting software systems during design, creation, testing and use.
- Describe the role of internet cookies.
- Use HTML tags to mark-up a document to specific requirements.
- Design, write, test and refine Java programs within the Greenfoot environment.

Students can continue to use [www.codecademy.com](http://www.codecademy.com) 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: <https://www.codecademy.com/learn/learn-java>

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><b>TERM 3</b></p> <p>Compilers, interpreters and assemblers</p>	<ul style="list-style-type: none"> <li>• Describe the purpose and give examples of the use of compilers, interpreters and assemblers.</li> <li>• Explain the principal stages involved in the compilation process: lexical analysis, symbol table construction, syntax analysis, semantic analysis, code generation and optimisation.</li> <li>• Describe and give examples of programming errors.             <ul style="list-style-type: none"> <li>• Syntax</li> <li>• Runtime/execution</li> <li>• Logical</li> <li>• Linking</li> <li>• Rounding</li> <li>• Truncation.</li> </ul> </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>Software tools</p>	<ul style="list-style-type: none"> <li>• Explain the role of Integrated Development Environment (IDE) tools in developing and debugging programs.</li> <li>• Understand the ways in which the IDE assists in the development and debugging of programs including:             <ul style="list-style-type: none"> <li>• Editor</li> <li>• Compiler</li> <li>• Interpreter</li> <li>• Linker</li> <li>• Loader</li> <li>• Debugger</li> </ul> </li> </ul>	

<p>Levels of computer language</p> <p>HTML RECAP</p> <p>Java Programming using Greenfoot</p>	<ul style="list-style-type: none"> <li>• Trace</li> <li>• Break point</li> <li>• Variable watch</li> <li>• Memory inspector</li> <li>• Error diagnostics</li> </ul> <ul style="list-style-type: none"> <li>• Describe the characteristics and purpose of high-level and low-level languages.</li> <li>• Identify and describe situations that require the use of a high level or a low-level language.</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> </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>
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<p>Python programming skills</p>	<ul style="list-style-type: none"> <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>   <li>● Preparation for the NEA, which is released in September.</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 Y9 and recapped in term 1, 2 & 3 of Y10.**

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