

### Key Stage 3

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the programme of study.

Pupils should be taught to	At Culcheth High School, this is taught
<ul style="list-style-type: none"> <li>design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems</li> </ul>	Year 7 Term 2 – Computational Thinking and Introduction to Algorithms (Constant & Variable values, Mathematical & Relational Operators)  Year 8 Term 2 – Advanced Problem Solving (Selection Statements and Iteration)
<ul style="list-style-type: none"> <li>understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching]; use logical reasoning to compare the utility of alternative algorithms for the same problem</li> </ul>	Year 8 Term 2 – Sorting(Bubble and Merge Sort) and Searching (Binary & Linear) Algorithms
<ul style="list-style-type: none"> <li>use two or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures [for example, lists, tables or arrays]; design and develop modular programs that use procedures or functions</li> </ul>	Year 7 Term 1 – Iteration (Scratch graphic based programming)  Year 7 Term 2 – Computational Thinking and Introduction to Algorithms (Python text based language)  Year 7 Term 2 – Selection Statements (Kodu Graphic based programming language)  Year 7 Term 3 – Database Structures (Top Trumps)  Year 8 Term 2 – Advanced problem Solving (1D & 2D arrays)  Year 8 Term 3 – Advanced Problem Solving and Code Efficiency (Functions and Procedures)
<ul style="list-style-type: none"> <li>understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming; understand how numbers can be represented in binary, and be able to carry out simple operations on binary numbers [for example, binary addition, and conversion between binary and decimal]</li> </ul>	Year 7 Term 1 – Introduction to Binary (Conversions)  Year 8 Term 1 – Binary Development (8 bit conversions and addition)  Year 8 Term 2- Advanced Problem Solving (Boolean Logic application AND/OR/NOT)

## National Curriculum Reference

### Computer Science

<ul style="list-style-type: none"> <li>understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems</li> </ul>	<p>Year 7 Term 1 – Under the Hood of a Computer</p> <p>Year 8 Term 1 – Operating Systems and Machine Code</p>
<ul style="list-style-type: none"> <li>understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits</li> </ul>	<p>Year 7 Term 1 – Binary data structures (images)</p> <p>Year 8 Term 2 – Binary data structures (images, sound, characters)</p>
<ul style="list-style-type: none"> <li>undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users</li> </ul>	<p>Year 7 Term 1 – E-safety</p> <p>Year 7 Term 3 – Software Applications</p> <p>Year 8 Term 1 – Network Structure and Security</p> <p>Year 8 Term 3 – History of Computing and Computer Scientists</p>
<ul style="list-style-type: none"> <li>create, re-use, revise and re-purpose digital artefacts for a given audience, with attention to trustworthiness, design and usability</li> </ul>	<p>Year 7 Term 1 – E-safety</p> <p>Year 7 Term 3 – Software Applications</p> <p>Year 8 Term 3 – History of Computing and Computer Scientists</p>
<ul style="list-style-type: none"> <li>understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct and know how to report concerns.</li> </ul>	<p>Year 7 Term 1 – E-Safety</p> <p>Year 8 Term 1 – Network Structure and Security</p>

**Key Stage 4**

Pupils should be taught to	At Culcheth High School, this is taught
<ul style="list-style-type: none"> <li>develop their capability, creativity and knowledge in computer science, digital media and information technology</li> </ul>	Year 9 Term 1 & 2 – Computational Thinking and Problem Solving  Year 10 Term 1 & 2 – Data, Computer Hardware and Networks
<ul style="list-style-type: none"> <li>develop and apply their analytic, problem-solving, design, and computational thinking skills</li> </ul>	Year 9 Term 1 & 2 – Computational Thinking and Problem Solving  Year 10 Term 3 – NEA Practice Assignment  Year 11 Term 1 – NEA Preparation and Completion
<ul style="list-style-type: none"> <li>understand how changes in technology affect safety, including new ways to protect their online privacy and identity, and how to identify and report a range of concerns.</li> </ul>	Year 11 Term 2 – Computing “The Bigger Picture”