

Term/Focus	Unit 9.1 – Data and Data Representation
<p><b>Key knowledge and skills –</b> What core knowledge and key skills will be acquired and developed by students?</p>	<p><b>Foundation</b></p> <ul style="list-style-type: none"> <li>• State that data is different to information</li> <li>• Explain that binary is used by computers to process and store data</li> <li>• List some of the main types of storage devices</li> <li>• Give some examples of storage sizes</li> <li>• Read a binary number and work out its value</li> <li>• Add two binary numbers together</li> <li>• Explain that a character is represented in a computer as a binary number</li> <li>• Decode a binary image</li> <li>• Create a simple image in binary</li> <li>• State that sound is converted into binary</li> <li>• Plot digital sound graphs</li> <li>• Perform a linear and a binary search</li> <li>• Shows the steps to perform either a linear or a binary search</li> <li>• Perform a bubble sort</li> <li>• Perform a merge sort</li> <li>• Perform an insertion sort</li> <li>• Write the notation for the logic gates AND, OR and NOT</li> <li>• Complete truth tables for the logic gates AND, OR and NOT</li> </ul> <hr/> <p><b>Developing</b></p> <ul style="list-style-type: none"> <li>• State that data is different to information</li> <li>• Explain that binary is used by computers to process and store data</li> <li>• List the main types of storage devices</li> <li>• Give examples of storage sizes</li> <li>• Read a binary number and work out its value</li> <li>• Write a denary number in binary</li> <li>• Add two binary numbers together</li> <li>• Explain that a character is represented in a computer as a binary number</li> <li>• Decode a binary image</li> <li>• Create a simple image in binary</li> <li>• Explain that sound is converted into binary</li> <li>• Plot digital sound graphs</li> <li>• Perform a number of linear and binary searches</li> <li>• Shows the steps to perform a linear search and a binary search</li> <li>• Perform a bubble sort</li> <li>• Perform a merge sort</li> <li>• Perform an insertion sort</li> </ul>

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	<ul style="list-style-type: none"> <li>• Write the notation for the logic gates AND, OR and NOT</li> <li>• Complete truth tables for the logic gates AND, OR and NOT</li> </ul> <p><b>Good</b></p> <ul style="list-style-type: none"> <li>• Explain how data is different to information</li> <li>• Explain why binary is needed in a computer</li> <li>• Explain the main types of storage devices and give examples</li> <li>• List the storage sizes in order</li> <li>• Explain why computers use the binary number system</li> <li>• Read a binary number and work out its value</li> <li>• Write a denary number in binary</li> <li>• Add two binary numbers together</li> <li>• Explain how to add binary numbers together</li> <li>• A detailed explanation is given as to WHY computers can only use the binary number system</li> <li>• Find characters represented by binary numbers in order to crack codes</li> <li>• Translate binary numbers into characters</li> <li>• Decode a binary image</li> <li>• Create a simple image in binary</li> <li>• Describe how images are represented in binary on computer systems</li> <li>• Explain how sound is converted into binary</li> <li>• Plot analogue sound graphs</li> <li>• Explain how to perform a linear search and a binary search</li> <li>• Explain the difference between the two types of search</li> <li>• Explains and shows the steps to perform a linear search and a binary search</li> <li>• Gives some advantages and disadvantages of each</li> <li>• Explain how to perform a bubble sort, a merge sort and an insertion sort</li> <li>• Write the notation for the logic circuits using AND, OR and NOT to two levels</li> <li>• Complete truth tables for the logic circuits using AND, OR and NOT to two levels</li> </ul> <p><b>Exceptional</b></p> <ul style="list-style-type: none"> <li>• Explain the process behind data becoming information</li> <li>• Explain how binary works in a computer</li> <li>• Explain how a range of storage devices work</li> <li>• Explain how the storage sizes are calculated</li> <li>• Explain why computers use the binary number system</li> <li>• Read a binary number and work out its value</li> <li>• Write a denary number in binary</li> <li>• Explain how to convert from binary to denary and denary to binary</li> <li>• Add two binary numbers together</li> </ul>

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	<ul style="list-style-type: none"> <li>• Explain how to add two binary numbers together</li> <li>• Explain errors which may result</li> <li>• A detailed explanation is given as to WHY computers can only use the binary number system</li> <li>• Explain the error that occurs when the result of a binary addition is larger than 8 bits</li> <li>• Find characters represented by binary numbers in order to crack codes</li> <li>• Translate binary numbers into characters</li> <li>• Create their own coded messages</li> <li>• Decode a binary image</li> <li>• Create a simple image in binary</li> <li>• Explain why images are represented in binary on computer systems</li> <li>• Explain how sound is converted into binary</li> <li>• Plot analogue sound graphs</li> <li>• Explain the impact of changing the sample rate and the bit rate</li> <li>• Explain how to perform a linear search and a binary search</li> <li>• Explain the difference between the two types of search</li> <li>• Explain the advantages and disadvantages of each type of search</li> <li>• Explains and shows the steps to perform a linear search and a binary search</li> <li>• Gives a range of advantages and disadvantages of each</li> <li>• Compares the two types of searches for different situations</li> <li>• Explain how to perform a bubble sort, a merge sort and an insertion sort</li> <li>• Explain the advantages and disadvantages of each type of sort</li> <li>• Write the notation for the logic circuits using AND, OR and NOT to more than two levels</li> <li>• Complete truth tables for the logic circuits using AND, OR and NOT to more than two levels</li> </ul>
<b>Links to GCSE</b>	<p>1.2.2 Secondary Storage            1.2.3 Units            1.2.4 Data Storage            2.1.3 Searching and Sorting Algorithms</p>
<b>Homework</b> – Knowledge organiser created and on website?	<p>Yes            H1 Fill the Gaps / Correct the Teacher            H2 Revision Tool            H3 Fill the Gaps / Correct the Teacher            H4 Searches Poster            H5 Question Cards for revision games</p>
<b>Responsive Teaching</b> – how do we assess and feed back to students in this subject (formative and summative)	<p>Two weekly assessment of classwork to identify and correct misconceptions using Feedforward Book Look Record Sheet. Homework reviews to inform planning of next lesson. Revision Tool and Searches Poster to highlight areas for improvement and inform future planning. Test in lesson 12.</p>

<b>Term/Focus</b>	<b>Unit 9.1 – Data and Data Representation</b>
<b>Termly assessment content</b> – what content will be covered in your termly assessments (the two-week assessment window)?	End of Unit Test in Lesson 12 – all of the above.