


Year 8 Computer Science	Curriculum Intent: Computing consists of three stands: Computational Thinking, Computer Science and Digital Literacy. Within the Computer Science and Computational Thinking streams we will develop the student’s knowledge and understanding of what a computer is using the Input/Process/storage/output model of computing. In term one exploring the fundamentals of the model. We will examine the logic behind instructions and how they are processed. We de-mystify a computer by explaining what software is and how it is created, providing opportunities for students to develop their own software using a text-based programming language.			
Computer Science Year 8:	<p style="text-align: center;">Term 1: <i>Data Representation</i></p>	<p style="text-align: center;">Term 2: <i>Algorithms and Boolean Logic</i></p>	<p style="text-align: center;">Term 3</p>	
Topic Titles (in order of delivery)	Why Computers use binary Numbers (0-15) in binary – conversion Text as binary Images as binary Sound as binary Compression	Algorithms: <ul style="list-style-type: none"> • Computational logic • Flow charts • Pseudo Code Boolean Logic <ul style="list-style-type: none"> • Logic Gate / Truth tables • Boolean Operators • Arithmetic Operators 	Introduction to programming <ul style="list-style-type: none"> • Variables • Input, output, storage • Sequence • Selection • Iteration • Operators 	
Key knowledge / Retrieval topics	Computers are a collection of switches Storage units What is a character set? Number of characters in 8 bits Impact of image quality / colours on file size Impact of sound quality / sample rate on file size Why compression is used	Algorithms are a set of instructions to solve a problem / perform a task. How to use flowcharts to describe / define an algorithm Know the main features of a flowchart Boolean Logic / Truth tables <ul style="list-style-type: none"> • Know the three basic logic gates • develop truth tables for the three gates • evaluate simple Boolean operators 	A Variable is a ‘named location in memory’ the contents of which can change while the program is running. How to assign values to variables How to use variables to produce output, store input and perform calculations Sequence is arranging instructions in a logical order Selection is deciding which instructions to execute based on a Boolean decision Iteration is the execution of a set of instruction several times based upon a Boolean decision	
Understanding / Sequence of delivery	How computers process data using switches Bit, nibble, byte, kilobyte, megabyte, gigabyte, terabyte Text can representation as binary <ul style="list-style-type: none"> • 127 chars (7-bit ASCII) • 256 chars (8-bit ASCII) • Other character sets (Unicode) • Why other character sets – non-English, kanji, Cyrillic et al Images as Binary	Algorithms: <ul style="list-style-type: none"> • Computational logic <ul style="list-style-type: none"> ○ Identify the success criteria of a problem • Flow charts <ul style="list-style-type: none"> ○ Produce algorithms using flow charts ○ Use and be familiar with the flow chat shapes <ul style="list-style-type: none"> ▪ Start / Stop (End) ▪ Process ▪ Input / Output ▪ Decision ▪ Flow Lines Boolean Logic	Programming techniques <ul style="list-style-type: none"> • Variables <ul style="list-style-type: none"> ○ State what a variable is (A named location in memory that can change whilst the program is running) ○ Explain what a variable is (to store data while a program is running) ○ Perform basic mathematical or logical functions on variables • Input, output, storage 	

	<ul style="list-style-type: none"> • bitmap of pixels • pixels smallest part of a picture • RGB – colours • colour depth • resolution • lossy / lossless • file sizes • different image formats <p>Sound as Binary</p> <ul style="list-style-type: none"> • bit rate • sample rate • lossy / lossless • file sizes • different sound formats <p>Compression:</p> <ul style="list-style-type: none"> • transmission time • storage 	<ul style="list-style-type: none"> ○ Understand simple binary logic and its use in simple programs ○ Be able to create basic truth tables for the output of the logic gates: <ul style="list-style-type: none"> ▪ AND ▪ OR ▪ NOT • Boolean Operators <ul style="list-style-type: none"> ○ Understand and evaluate the following Boolean operators <ul style="list-style-type: none"> ▪ Equal to (a==b) ▪ Not equal to (a!=b) ▪ Less than (a<b) ▪ Greater than (a>b) • Arithmetic Operators <ul style="list-style-type: none"> ○ Understand and be able to use the following mathematical symbols <ul style="list-style-type: none"> ▪ + (add) ▪ - (subtract) ▪ * (multiply) ▪ / (divide) 	<ul style="list-style-type: none"> ○ Explain and show how input may be captured and assigned to a variable for use / storage within a program ○ Explain and show how to output text or movement on a screen ○ Be able to use a range of data types including: <ul style="list-style-type: none"> ▪ Integers ▪ Real numbers (floats) ▪ Text ▪ Boolean ▪ Lists / arrays (one dimensional) or equivalent • Sequence <ul style="list-style-type: none"> ○ Understand that instructions are executed in the sequence they are written ○ Write programs with instructions in the correct order ○ Be able to identify errors in the order of a sequenced set of steps • Selection <ul style="list-style-type: none"> ○ explain and identify how programs can be made to execute code based on a choice (true or false) ○ Write programs that use selection <ul style="list-style-type: none"> ▪ If ▪ Else ▪ Else it (elif) • Iteration <ul style="list-style-type: none"> ○ Understand what is meant by a loop ○ Use a loop to execute statements multiple types ○ State the difference between a for loop and a while loop • Operators
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Assessments	<p>Cat 1: Basics of binary representation</p> <ul style="list-style-type: none"> • text • images • sound • compression <p>Plus Computer Basics, storage and applications from Year 7</p> <p>Homework</p>	<p>Cat 2: Algorithms and Boolean logic</p> <p>Basics of binary representation</p> <p>Plus Computer Basics, storage and applications from Year 7</p>	Completion of Programming Project