

KEY STAGE THREE CURRICULUM KNOWLEDGE AND SKILLS MAPPING TOOL

SUBJECT: Computing

	KNOWLEDGE	SKILLS
YEAR 7	<p>Data Types: Understanding how computers represent data using Binary and ASCII.</p> <p>Logic: Manipulation of data within a system using individual and sequences of Logic Gates (AND, OR, NOT).</p> <p>Algorithms: Learn about Flow of data through a sequence and processes used for Searching and Sorting data.</p> <p>E-Safety: Data Protection and associated litigation: DPA/GDPR, Hacking and Systems Penetration, Phishing & Social Engineering, Cyber Bullying.</p> <p>Digital Devices: Input, Output, Storage and Processing as well as the uses for each device depending upon the situation/location.</p> <p>Quality of Data: Reliability, Validity and Bias of information, Manipulating data in Graphic & Audio format, Identifying methods of protecting data.</p> <p>Programming: Sequencing of events and storing data in variables, Developing algorithms that respond to user input.</p>	<p>Data Types: Conversion between Denary, Binary and ASCII and performing calculations on data stored in Binary Format.</p> <p>Logic: Creating Sequences of Logic Gates and representing the inputs and outputs using Truth Tables.</p> <p>Algorithms: Inputs, Processes and Output. Arranging data for use through sorting algorithms (Bubble Sort)</p> <p>E-Safety: Identifying Official vs Phishing emails, Identifying laws that affect the way we use Digital Devices.</p> <p>Digital Devices: Selecting the correct device for purpose and being able to adapt current systems to meet the needs of the differently abled.</p> <p>Quality of Data: Develop Investigation & Research skills to improve student's ability to differentiate between different types of information. Students need to demonstrate an understanding of how data is affected by the source, validity and bias.</p> <p>Programming: Create programs that follow specific sequences of events. Use variables to store and retrieve different types of data. Use Sequence, Selection and iteration to create events that create different outputs depending upon the input.</p>

		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
YEAR 7	Content	Data Types & Logic Binary ASCII Logic gates Sorting Algorithms	E-Safety Online Scams Hacking Viruses Social Engineering	Understanding Computers Digital Devices Input Output Storage Processing	Bizarre Facts Data: Validity and Bias Modifying Images and sounds Using Key words and Boolean Operators	Using Logo Sequencing events Creating algorithms Storing Variables Testing Events	Games Programming in Scratch Developing Sprites Using variables Influencing events with inputs Creating procedures and subroutines
	Skills	Comparing data types and understanding how information can be presented in different ways	Investigate the methods used by scammers to harvest information	Build computers using individual components and identify why standards are important	Identifying when data has been modified or influenced in some ways	Create sequences of events that output information based on user input	Create entire systems designed to control events on the screen and store information such as levels and score as variables
	Assessment	Written assessment of skills to identify how students deal with a range of issues that affect their safety when using the Internet. Electronic assessment of overall learning, specifically focussing on data types and logic.		Written assessment of skills developed when manipulating data in text, image and audio formats. Electronic assessment of students' skills with regard to the use of digital devices and the way information is stored and retrieved.		Students are assessed on their ability to create efficient sequences of events using subroutines as demonstrated throughout the project. An electronic assessment will gauge students' understanding of the terminology and key themes used throughout the units of work.	

	KNOWLEDGE	SKILLS
YEAR 8	<p>Hardware and Software: The features and functions of each aspect of the computer system, including Processing devices and Peripherals. The difference between Applications software, Scripts and Utilities.</p> <p>Data Transmission: The Internet, WANs, LANs and PANS, Network technologies such as Wired and Wireless as well as the benefits of their use depending upon the situation.</p> <p>Data Protection and Security: Hacking and defending against it using Firewalls, Antiviruses and Passwords, Social Engineering and how it can be avoided as well as a basic understanding of SQL Injection and how computers can be “tricked” into providing data.</p> <p>Data Modelling: Use of formulae to carry out consistent calculations. Cell referencing and absolute cell referencing to link a formula to specific data. How Functions can be used to display outputs depending on the data that has been entered. Types and uses of Graphs for portraying information.</p> <p>Flow of Data: Flowchart symbols and how they can be used to represent a sequence of events. The way Algorithms can be used to carry out a sequence of steps that can then be reused in similar situations. The way Inputs are processed and will affect the Output.</p> <p>Storage/Retrieval of Data: Database design and the way information can be separated into a table that combines similar information. The way tables are made up of Fields and Records and the use of relationships for linking tables.</p> <p>Graphic Design: Vector and Raster images and the benefits of their use in different situations. The use of Pixels to represent an image and how they can be used to calculate the Resolution of an image. The various file types available and how they can be Lossy or Lossless depending upon use and requirement.</p>	<ul style="list-style-type: none"> • Hardware and Software: Students should be able to identify and explain the uses for each aspect of a computer system. They should be able to select the correct device to be used in a range of situations and look at the advantages and disadvantages. • Data Transmission: Students should be able to draw and label Network Topologies such as Star and Mesh. They should be able to discuss the benefits of Wired vs Wireless networks depending upon the requirement. • Data Protection and Security: Individuals should consider their own Internet security and look at ways they could make improvements. • Data Modelling: identify how real life situations can be modelled and tested to see if the required outcome will occur. • Flow of Data: Students will be able to break tasks down into small components and identify how they can change the progress through a sequence depending upon the input. Generate algorithms that can be reused in similar situations. • Storage/Retrieval of Data: Students should be able to create working solutions that can store data effectively. They should be able to generate queries that can retrieve data based on specific criteria and filter & sort their results. • Graphic Design: Use tools and techniques to manipulate images for particular purposes and be able to identify the correct file types required for storing it depending on the final use.

		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
YEAR 8	Content	Interactive Quiz Hardware Software Data Protection The Internet Hyperlinking Web Design	Cyber Crime and Security Hacking and Phishing The Dangers of the Internet Staying safe online SQL Injection	Spreadsheets Formulas Functions Graphs Presentation of Data	Flowol Sequencing Input and output Algorithms and Procedures Variables	Graphics Vector and Raster Resolution Pixels Tools and Techniques	Databases Tables, Fields, Records Validation and Verification Relationships
	Skills	Creating an interactive quiz using hyperlinks to navigate between questions and testing their knowledge of a range of computer related issues	Investigate the dangers of the Internet and be able to instruct others how to stay safe online in a range of situations	Create useful spreadsheet models that simulate situations in order to test a range of scenarios	Create algorithms that represent sequences of events. Use inputs and outputs to show that changes can be made to each situation	Look at the various types and uses of images as well as the way they are designed using tools and techniques inside graphics packages such as Photoshop or Fireworks	Create tables designed to store different types of data and allow the retrieval of information through queries which can be displayed in reports.
	Assessment	Assessment of the work completed when creating the interactive quiz though testing of the Functionality, Presentation, Layout and fitness for purpose. Electronic assessment of the students' knowledge and understanding of the key themes and terminology used in the unit.			Overall assessment of the development of the spreadsheet, including students' own abilities to reflect upon The functions used, the reasons for their use and their final implementation. Electronic assessment of students' abilities to develop algorithms that fit the criteria specified in the assessment as well as their understanding of the important terminology used when creating programs and algorithms.		Assessment of the skills that are demonstrated when students use the image manipulation abilities developed throughout the course as well as students' own reflection showing the reasons for their use in each situation. An electronic test designed to the skills and abilities that students have developed when creating systems designed to store and retrieve information.