Year 7 COMPUTER SCIENCE Curriculum Map

Term	Topic/Unit title	Essential knowledge (what students should *know and understand* by the end of the unit/topic)	Essential skills (what students should *be able to do* by the end of the unit/topic)
Autumn 1	Introduction to the network and google suite	Students should know: how to access google suite in school and at home How to find your class and any assignments in google classroom How to access PowerPoint in school/ slides at home How to access the master slide how to select complementary colours The effect of being consistent n applying colours, placing images, transitions, and animations.	Students should be able to: Open an assignment and any attached resources Upload work to an assignment Hand in an assignment Set the background colour and font colour apply transitions to a slide and animations to the content objects. Synchronise animations on 2 different objects on a slide

Autumn 2	Computer Systems	Students should know: the definition of an Input Device, an Output Device and how to classify a device by its function the purpose of storage devices, classification of storage devices, how to identify the technology used by a storage device the components that make up a computer system and their function that computers use binary the number system to store all data how the binary number system works how the ASCII text coding system works	Students should be able to: classify an peripheral device as input/output by thinking about the data flow classify a storage device as either internal or external by thinking about where the device is installed and whether it uses magnetic/optical/solid state technology by thinking if the device has moving parts or refracts light or neither. relate the components of a computer system to their human equivalent convert from decimal to binary, binary to decimal convert from ASCII text to decimal ASCII codes and vice versa then apply knowledge about binary to decimal
Spring 1	Podcasting/Esafety	Students should know: How to remove unwanted start and end portions of a clip How to split out part of a clip. The effect of changing distance to the microphone and the microphone sensitivity	Students should be able to: use part of an existing clip use gain to equalise the volume of 2 different clips how to change microphone sensitivity

		how to join 2 or more clips the meaning of the tool symbols in audacity the impact of privacy settings on the reach of a post the risk of sharing too widely the need for a script the content of a script	apply fade in- fade out effects to clips Use the timeshift tool to overlap 2 sounds. create a script for an e safety podcast
Spring 2/Summer 1	Computer Games	Students should know: the features of games that make people want to play them the important features of a plan for a game the definition of sprite use sprites for graphics which move or need to be hidden/shown at different times how to detect key presses in scratch how to control when code executes (selection) how to ensure code executes a number of times (iteration) how to move sprites automatically	Students should be able to: Review a game create a design for a game create sprites using scratch create backgrounds using scratch detect keypresses use if statements to make code execute when a particular key is pressed use of forever to ensure code keeps executing use loops to move sprites detect collisions between sprites change the visibility/position of a sprite

		setting/changing a sprite's state How to detect collisions in scratch How to detect the end of a level	use "touching color" condition, broadcast event and event received to change game background/sprite state
Summer 2	Websites	Students should know: how Navigation Bars, logos and content layout are used consistently in commercial websites how to ensure consistency using a master page Create pages to meet the requirements of a brief Webplus projects need to be published to work with a browser	Students should be able to: setup master page selecting background colour, font colour, navigation bar and logo. Add pages to a project Name pages including filename Add text, images, video, hyperlinks, hotspots to webpages Publish their projects and test them in a browser such as chrome

Year 8 COMPUTER SCIENCE Curriculum Map

Term	Topic/Unit title	Essential knowledge (what students should know and understand by the end of the unit/topic)	Essential skills (what students should be able to do by the end of the unit/topic)
Autumn 1	Spreadsheets	Students should know: definition of a cell reference How to read a location on a spreadsheet, how to decode a cell reference the definition of a formula How to use cell references in a formula How to use functions and cell ranges in formulas How to present results using charts	Students should be able to: Select a location on a spreadsheet from a cell reference perform calculations using formulae perform calculations on ranges of cells using functions select data for use in a chart create an appropriate chart on a new page
Autumn 2	Digital Graphics	Students should know: that a filter can be applied to an image to alter the look of the image how to select portions of an image and use recolourise to add colour to a greyscale image	Students should be able to: use the liquify filter to produce a characture use quick select/magnetic lasso to select parts of an image and colourise using Hue/Saturation (with colorize), Add layers (with images) to make a new scene Alter layer properties e.g. size and position

		Recolouring is a valuable skill in digital imaging which is used in film restoration e.g. "WWI in colour" that an imaging project can use multiple layers to control the order that images appear on screen How to remove the background from an image to make it transparent that layers can contain shapes/text effects can be added to a layer to enhance its impact on the overall project	Alter the order of layers Unlock an image to allow the background to be removed How to create a layer containing a shape or text alter the properties of the shape/text e.g. colour or orientation add blending options to a layer
Spring 1 & 2	HTML/CSS	Students should know: how a web browser is told how to display the content of a webpage that the operating system uses the file extension to select the application to load a file with. "htm" is for webpages. that tags are used to describe the formatting of a webpage's content that tags can be used to control the colours used on a webpage That tags can be used to control the fonts used in a wepage	Students should be able to: create and HTML document (webpage) use tags to identify some text as heading style and some text as a paragraph Save their file as a wepage with htm extension. use properties of the body and font tag to set the background colour and font colour a webpage use other properties of the font tag to control the font style and size use a tag to include an image in a webpage

		That tags can be used to describe the location of an image that text displayed on a webpage can be different from the attached link which makes them unsafe to click on without checking	attach a link to text and an image using tags
Summer 1	Logic Gates and Binary Addition (4 weeks)	Students should know: that switches can be arranged in series and in parallel, exhibiting different behaviour The expected behaviour of AND, OR and NOT logic gates That logic gates can be combined into logical circuits whose behaviour can be predicted by considering the inputs to each logic gate and recording the outputs. Computers used logic circuits to implement the required functionality e.g. add A 1 bit adder is used to add a bit from 2 numbers together. these can be chained together to add 2 binary numbers together how to perform binary addition	Student should be able to: work out the behaviour of a DC circuit use logic.ly to investigate AND, OR, NOT logic gates identify that series switches exhibit AND behaviour and parallel switches exhibit OR behaviour Predict the behaviour logic circuits with upto 3 inputs using truth tables Complete a truth table methodically add together 4 and 8 bit binary numbers
Summer 1/2	Problem solving with Code.org (4 weeks)	Students should know: programs consist of sequences of instructions	use multiple commands chained together to make sequences

		some programs make use of selection (IF)to conditionally execute code some programs make use of iteration to conditionally execute code (WHILE) multiple times or execute code a set number of times (FOR) Complex sequences can be broken down into simpler steps which can be repeated to make the complex output Variables allow programs to access values that have been calculated so far and update them	use the IF block with comparisons to conditionally execute code use the WHILE block with conditions to execute code until the control condition is no longer true use the FOR block to control the number of times a loop executes, access the loop counter from within the looped code solve complex shape problems by breaking down the required moves into a repeatable sequence Use variables to store and retrieve calculated values
Summer 2	Cyber Security (5 weeks)	Understand how technology is relied upon and that technology enhances most industries. Understand the need for digital skills in career roles. Understand the concept of computer networks and common deployments. Understand how firewalls and encryption are used to protect networks and data. Understand the Internet of Things (IoT), risks and uses.	Students should be able to: identify sources of software and risks of using untrusted products Recognise common security settings for browser and mobile apps. Recognise common types of malware and delivery methods Recognise threat groups and their motivations. Recognise types of device/system accounts and the associated risks of using these.

		Understand the role of an Application Security Specialist. Understand the role of Digital Forensics Understand the role and application of physical security measures. Understand authentication methods, including passwords and multi-factor authentication (MFA). Understand the role of Security Testers. Understand the concept of a digital footprint and associated risks. Understand the role of Social Engineers and Open Source Intelligence investigators.	Recognise common characteristics of a phishing message. Recognise social engineering techniques used by cyber-criminals. Recognise fundamental technical skills and knowledge used by cyber security professionals. Recognise fundamental soft skills required in cyber security.

Year 9 COMPUTER SCIENCE Curriculum Map

Term	Topic/Unit title	Essential knowledge (what students should know and understand by the end of the unit/topic)	Essential skills (what students should be able to do by the end of the unit/topic)
Autumn 1	Hexadecimal	Students should know: hexadecimal is a shorthand method for representing binary sequence that each hex digit represents 4 bits of binary All possible 4 bit sequences are represented by a single hexadecimal digit How to convert between 8 bit binary and hexadecimal How to convert between decimal and hexadecimal The ASCII Table can be expressed using hexadecimal codes which makes it much quicker to convert between binary and ASCII	Students should be able to: produce the hexadecimal table which maps the 16 4 bit binary sequences to their corresponding hex digit and their decimal equivalent convert between 4 bit binary to hex split an 8 bit binary sequence into 2 4s and therefore express an 8 bit binary number using 2 hexadecimal digits Convert between decimal and hexadecimal Convert between ASCII and binary (using the hex ASCII Table)

Autumn 2	Digital Graphics	Students should know: that an imaging project can use multiple layers to control the order that images appear on screen Digital Graphics is creating a product using digital imaging techniques for a purpose layers can be made less solid to use as outlines how to hide part of an image how to add effects to layer	Students should be able to: unlock an image for editing use of magic wand/magnetic lasso to select parts of an image for deletion Place images in layers Reorder/resize/move each layer to make a new composition Change font/colour/Add images using layered graphic elements Change opacity (transparency) for a layer Use layer masks to hide parts of a layer Use blending options to add effects to a layer, improving the look of the product

Spring 1	Databases	Students should know: Databases allow us to organise data Data is organised into records and fields Fields contain pieces of data A record contains all the pieces of data about a particular item We can find matching items by matching against 1 or more fields Databases allow records to be changed Databases allow records to be added Databases allow for searches to be created will return the required fields from matching records.	be able to filter fields to identify matching records update the record for a particular suspect in the murder mountain database add records for newly identified suspects in the murder mountain database Write queries using Access to search for records matching 1 field 2 or more fields
Summer 2/Summer 1	Algorithms	Students should know: Computer programs need input so they can process the data and output the results One type of data processed by programs is Text - Strings One type of data processed by programs is numbers - integers Use of the int() function to cover from strings to integers	Students should be able to: get data from a user join strings together present results convert input to integers perform arithmetic calculations: add, subtract, multiply and divide use relational operators

		How to write a program which makes decisions about which code to execute One type of selection is the IF statement Relational operators are used to create conditions which determine when code is to execute How to write a program which makes use of iteration (loops) to repeat code execution a set number of times One type of iteration is the FOR statement Range object used to specify the range of values the FOR loop operates over write a program which makes use of iteration (loops) to repeat code execution until a controlling condition is no longer true One type of iteration is the WHILE statement Random numbers allow for unpredictable events in computer programs Computers can sort and search for data, sorted data can be searched much more efficiently than unsorted data.	use IF statement, ELIF and ELSE to make code which controls which statements to execute depending on conditions use FOR loops to control how many times a block of code is to execute use a Range object to count up to a maximum value use WHILE loops to repeat execution of code until a condition is no longer true use Random numbers to simulate unpredictable events such as dice rolls Be able to create simple programs making use of bubble sort, linear search and binary search to sort and find data in a list. describe how binary search is much more efficient than linear search,

Summer 2	Project	This unit recaps ICT skills from Digital Graphics and Digital Applications	Students should be able to select suitable applications to prepare resources to create advertising material including a poster and website to publicise a music festival.