Half term	Unit title	Key knowledge/ Content to learn and retain	Essential skills to acquire (subject & generic)	Link to subject ethos and driver (rename)	Anticipated misconceptions	Links to previous KS	Links to future KS	Opportunity for stretch for high prior attainers	SMSC & British Values	Cultural Capital	Career Link
HT1	Computing systems	1.Get in gear what sets devices apart from other purpose-built machinery: their ability to execute programs that allows them to modify their operation and perform different tasks compare calculating machines from the past to modern general-purpose computers 2.Under the hood the components that perform the tasks in machines introduce learners to the hardware components, i.e. the actual 'machinery' that allows computing systems to fulfil this purpose how all computing	Look at programs that allow to modify their operation and perform different tasks compare calculating machines from the past to modern hardware components: processor, memory, storage, input and output devices, and communication components and how they work together in order to execute	Students should know what they have done in a context of where that will lead to with high levels of engagement through a passion for learning and a level of challenge. Students are happy and demonstrate a hunger for learning. Misconceptions are corrected and challenged at an appropriate level.	Students may not understand itis programs that allow to modify program's operation and perform different tasks Students may not understand how hardware components work together in order to execute programs	KS2 - Connecting Computers	KS4 - BTEC Tech Award DIT Component 3: Effective Digital Working Practices Create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability Understand a range of ways to use technology safely, respectfully, responsibly, and securely,	Contrast calculating machines from the past to modern general-purpose computers Fully understand and verbalise what 'universal' components do, and how they work together in order to execute programs.	From an environmental standpoint students are encouraged to understand the ways that computer systems and parts can be recycled, reused and have extended lives. The understanding of environmental impacts is taught through lesson themes. Democracy is something students will learn about and will know how to treat others fairly and how to make things	We encourage students to read newspapers We encourage students to watch the news Current affairs are incorporated into lessons Make links to 'real life'	The skills learned from completing KS3 will provide background and knowledge for students to progress into work roles and be computer and software literate. Specialist careers in IT will include: IT teacher Web designer Graphic artist Animator Software Developer Data Analyst

		systems, regardless of form or capabilities, make use of the same components what each of these 'universal' components does, and how they work together in order to execute programs. 3.Orchestra conductor learners look under the surface and gain a further glimpse into what goes on under the hood when they use computing devices the operating system, which is responsible for managing the complexity of modern computing devices an additional bridge between theory and practice. 4.It's only logical uncover the connection between logic and computing hardware bridge the gap between logic and circuits, and make the direct link between them explicit the hierarchy of a computing system, from programs,	programs hardware components: processor, memory, storage, input and output devices, and communicatio n components the operating system connection between logic and computing hardware. logic and circuits hierarchy of a computing system		Students may not understand the operating system, and how it is responsible for managing the complexity of modern computing devices Students may not be able to make the connection between logic and computing hardware		including protecting their online identity and privacy; recognise inappropriate content, contact and conduct and know how to report concerns	Able to verbalise the bridge between theory and practice regarding modern computing devices Fully know and verbalise the hierarchy of a computing system	work for the whole class as well as the individual. Rule of Law is taught through lesson themes as well with school rules also being adhered to and considered at all times. Individual Liberty – It is important to have students understand their freedoms as well as knowing how these fit in with the school ethos. Students will know their rights as individuals and will know both what to expect and what is expected of them.		Systems Analyst Business Analyst IT Support Analyst Network Engineer IT Consultant Technical Sales Rep

		hardware responsible for executing the programs, and the fundamental components that comprise this hardware Thinking machines 5.''Can machines think?'" – definitions of artificial intelligence and machine learning machine learning and investigate its relationship with conventional programming what training a model involves, and the ethical considerations that are tied into building any system that makes decisions 6. sharing Assessment for understanding of computing systems concepts key concepts of open source software	artificial intelligence and machine learning conventional programming ethical considerations open source software		Some students may not be able to define artificial intelligence and machine learning Students may not understand the implications of sharing programs			Fully know and verbalise the ethical considerations that are tied into building any system that makes decisions Search for examples of free, libre, and open source software. and find any familiar programs that is already used	Mutual respect for tolerance of those with different faiths and beliefs, and for those without faith is important Resilience is taught through the lessons when students are pushed to achieve their best, moving out of their perceived limits at times and getting the deserved rewards as a result.		

			Literacy Communication Self management Non-routine problem solving – expert thinking, metacognition, creativity Systems thinking – decision making and reasoning Critical thinking – analysing, synthesising and reasoning skills Evaluation Justification								
HT2	Modelling data - Spreadsheets	1.Getting to know a spreadsheet Introduces learners to the concept of spreadsheets and why	Introduce learners to the concept of spreadsheets and why spreadsheets are useful.		Students may not realise that the way data is presented affects how easy the data	KS2 – The Internet Web page creation	Due to the pandemic and no access to computers/Excel the unit assumes that learners have little to	Formatting cells with borders and shading	From an environmental standpoint students are encouraged to understand the ways that	We encourage students to read newspapers	The skills learned from completing KS3 will provide background and knowledge

		spreadsheets are useful. They will learn how to navigate a spreadsheet via its rows and columns, and become familiar with the cell referencing system. They will locate and select ranges of cells and change cells' background colour and border properties.	Learn how to navigate a spreadsheet via its rows and columns, and become familiar with the cell referencing system. Locate and select ranges of cells and change cells' background colour and border properties. Enter text into cells perform calculations on the data using basic formulas and cell references.		is to analyse		no experience of using spreadsheets KS2 - Flat-file databases Introduction to spreadsheets		computer systems and parts can be recycled, reused and have extended lives. The understanding of environmental impacts is taught through lesson themes. Democracy is something students will learn about and will know how to treat others fairly and how to make things work for the whole class as well as the individual. Rule of Law is taught	We encourage students to watch the news Current affairs are incorporated into lessons Make links to 'real life'	for students to progress into work roles and be computer and software literate. Specialist careers in IT will include: IT teacher Web designer Graphic artist Animator Software Developer

		2. Quick calculations Practise entering text into cells of a spreadsheet and then learn how to perform calculations on the data using basic formulas and cell references. They will learn how to use the autofill tool to duplicate cells and continue a linear pattern, and then combine the autofill tool with basic formulas to quickly populate a results column with calculations.	use the autofill tool to duplicate cells continue a linear pattern, combine the autofill tool with basic formulas Populate a results column with calculations. using formulas Difference between data and information and between		Students might struggle with operators for multiplication * and Division /			Autofill vertically and horizontally to quicken calculations	through lesson themes as well with school rules also being adhered to and considered at all times. Individual Liberty – It is important to have students understand their freedoms as well as knowing how these fit in with the school ethos. Students will know their rights as individuals and will know both what to expect and what is expected of them.		Data Analyst Systems Analyst Business Analyst IT Support Analyst Network Engineer IT Consultant Technical Sales Rep

			primary and secondary sources of data.								
		3. Collecting data Further practise of using formulas. Then learners will discover the difference between data and information, and between primary and secondary sources of data. They will then design a survey to collect some data of their own for use in the next lessons.	design a survey to collect some data of their own use functions to analyse data automatically create charts from data Use SUM, MAX, MIN, and COUNTA		Knowing the difference between data and information			Able to analyse data	Mutual respect for tolerance of those with different faiths and beliefs, and for those without faith is important Resilience is taught through the lessons when students are pushed to achieve their best, moving out of their perceived limits at times and getting the deserved rewards as a result.		
		4. Become a data			Knowing the difference between primary and						

		master Learners will discover how to use functions to analyse data in a spreadsheet. As well as learning how to automatically create charts from data, they will be introduced to four functions: SUM, MAX, MIN, and COUNTA. Functions allow you to very quickly calculate results. The functions covered in this lesson are used to calculate totals, find the maximum and minimum values in a range, and count populated (i.e. non-blank) cells. 5. Level up your data skills Introduce learners to three more functions — COUNTIF, AVERAGE, and IF — and to how they can sort and filter a spreadsheet.	Use COUNTIF, AVERAGE, and IF — and sort and filter a spreadsheet		secondary information/ data Students not being able to locate/use functions SUM, MAX, MIN, and COUNTA in a spreadsheet			seen			

		Learners will work on a larger data set to get a feel for analysing real-world data using spreadsheets. 6. Assessment Learners discover how to use conditional formatting, whereby the appearance of a cell changes automatically depending on the data it contains, according to rules the learners themselves set. They then complete an end-of-unit summative assessment.	conditional formatting assessment		Students may not understand how to locate and use the functions COUNTIF, AVERAGE, and IF or How to sort and filter data			Able to change chart type, if and when appropriate for display			

			Literacy Communication Self management Non-routine problem solving – expert thinking, metacognition, creativity Systems thinking – decision making and reasoning Critical thinking –		Students may have difficulty using conditional formatting in a spreadsheet			Use the IF function to have a cell show different things depending on a criterion Use all of the spreadsheet skills covered in this unit to analyse data			

			analysing, synthesising and reasoning skills Evaluation Justification								

HT3	Intro to Python program ming	1.First steps write and execute first programs in Python. display messages, assigning values to variables, and receiving input from the keyboard what algorithms and programs are, and how	execute first programs in Python display messages, assigning values to variables receive input from the keyboard		Students may not be able to express instructions in a formal language, that can eventually be executed by a machine	KS2 – Events and actions Repetition in shapes Repetition in games		Able to fully express instructions for a program		Make links to ‘real life’	

		they are different. express instructions in a formal language, and how these instructions can eventually be executed by a machine 2.Crunching numbers gain a deeper understanding of assignments, and explicitly address some of the common misconceptions around the semantics of assignment statements arithmetic expressions and receiving numerical input from the keyboard construct their own short programs 3.At a crossroads progress to multi-branch selection Introduce while, the general-purpose iterative structure in Python. introduced to iteration import and use functions from	difference between algorithms and programs express instructions address misconceptions around the semantics of assignment statements arithmetic expressions receiving numerical input Use relational operators to form logical expressions Use binary selection (if, else statements) to control the flow of		Students may not grasp the common misconceptions around the semantics of assignment statements Students may not be able to use relational operators to form logical expressions	Variables in games		Able to construct a program Able to to control the flow of program execution using binary selection			

		‘home-grown’ modules created for the lesson. 4.More branches multi-branch selection introduce while, the general-purpose iterative structure available introduced to iteration build own iterative programs in the next lesson. 5.Round and round Counters used to compute results iteratively with each new value accumulated over the previous ones combine iteration and selection 6.Putting it all together apply and consolidate summative assessment	program execution if, elif, else statements while statements) while loops variables as counters Combine iteration and selection Boolean variables Literacy		Students may not understand concept of iteration Students may not understand that counters used to compute results iteratively Students may not be able to use control structures (sequence, selection, and iteration)			Can build own iterative program Able to combine iteration and selection Students can use boolean variables, operators, and expressions			

			Communication Self management Critical thinking – analysing, synthesising and reasoning skills Evaluation Justification		to build a more complex program						
HT4	Vector graphics	1.Get into shapes examples of vector graphics, to get a sense of what students will be developing draw geometrical shapes and manipulate them 2.Paths united path operations such as union, difference, and intersection to combine simple shapes into more complex ones 3.Icon challenges	basic shapes (fill and stroke, shape-specific attributes) select, move, resize, rotate, duplicate, flip, z-order select, group/ungroup, align, distribute union, difference, intersection		Some students may have difficulty with choosing/using either one or some select, move, resize, rotate, duplicate, flip, z-order Students may not be able to combine simple shapes into more complex ones Some	KS2 - Photo editing Vector drawing		Create a multi-shape object and manipulate/group combine simple shapes into more complex ones Able to use			

		Create elementary shapes and combine them with path operations Simple to more complex ones that require some creative thinking. 4.What will you make? undertake a short, open-ended project out of a range of suggestions and work in pairs to complete it. 5.Under the hood look at and modify an .svg file explore cases where vector graphics are (or aren't) useful. 6.Showcase showcase and peer assessing their projects .	Convert objects to paths Draw paths Edit path nodes multiple tools and techniques to create a vector graphic design what vector graphics are and where using vector graphics is appropriate Peer assess summative assessment		students will have difficulty to create elementary shapes and combine them with path operations Some students may find difficulty in doing a short, open-ended project Students may not be able to explain what vector graphics are Some students may not have completed project			creative thinking for more complex shapes Able to use multiple tools and techniques to create a vector graphic design Able to explore and decide cases where vector graphics are (or aren't) useful Present project to peers and offer peer assessment			

HT5	SWGFL	**1.Online Reputation and Managing Information Online** -Students can explain and give examples of how what anyone writes online can also affect their school, family or social group, or future opportunities. -Students can describe ways that someone can manage what others say and share about them and explain strategies to protect and individuals 'digital personality' -Students can navigate content, websites or social media feeds using more sophisticated tools to get the information they want, e.g. menus, sitemaps, breadcrumb trails, site search functions -Students can refine search phrases with additional functions (e.g. +, AND, "", NOT, *, Wildcard) -Students can explain how search engine rankings are returned and can explain how they can be influenced	Online safety skills - this term will cover 5 of the 8 key strands from the Education for a connected world framework **Note the others are covered in Collective worship and PSCHE* Communication skills - class discussions Literacy skills - literacy tasks in line with school policy	Wisdom to know how to be safe online and to have the courage to ask for help when needed **Online reputation:** Students will explore the concepts of reputation and how others may use online information to make judgements. They will have opportunities to develop strategies to manage personal digital content effectively and capitalise on technology's capacity to create effective positive profiles. **Managing online information :** Students	How search engines are ranked How to tell if a source is valid and reliable That content posted online may be used by others Freedom of speech and moral issues of content posted Fake news - what it is/isn't	Please refer to the "Education for a Connected World" framework which shows progression for all strands from KS1-KS5	Please refer to the "Education for a Connected World" framework which shows progression for all strands from KS1-KS5	The outcomes for the following year will be used as challenge work Real life applications and giving advice to others on topics will form a part of the challenge tasks	From an environmental standpoint students are encouraged to understand the ways that computer systems and parts can be recycled, reused and have extended lives. The understanding of environmental impacts is taught through lesson themes. Democracy is something students will learn about and will know how to treat others fairly and how to make things work for the whole class as well as the individual. Rule of Law is taught through lesson themes as	We encourage students to watch the news Make links to 'real life' examples	The skills learned from completing KS3 will provide background and knowledge for students to progress into work roles and be computer and software literate. Specialist careers in IT will include: IT teacher Web designer Graphic artist Animator Software Developer Data Analyst Systems Analyst Business Analyst IT Support Analyst

		(e.g. commerce, sponsored results). They can use a range of features to quality assure the content they access online (e.g. hits, likes, comments) -They can analyse and evaluate the reliability and validity of online information based on content as well as appearance - They can explain why accurate information can be used in a false context to deliberately be used selectively to disinform -They can explain that whilst everyone is entitled to their opinion, not all opinions are equally credible or morally defensible (and some may be restricted from public expression e.g. those that encourage racial or religious hatred). **2. Online bullying** -Students can explain their own criteria for distinguishing between online bullying and teasing (banter) online. They can offer examples to		will explore how online information is found, viewed and interpreted. They will learn strategies to search effectively, evaluate data, recognise risks and manage content of online threads and challenges. They should understand ethical publishing. **Online bullying:** Students will explore bullying and other online aggression and how technology impacts on these issues. They will learn strategies for effective reporting and intervention and consider					well with school rules also being adhered to and considered at all times. Individual Liberty – It is important to have students understand their freedoms as well as knowing how these fit in with the school ethos. Students will know their rights as individuals and will know both what to expect and what is expected of them. Mutual respect for tolerance of those with different faiths and beliefs, and for those without faith is important		Network Engineer IT Consultant Technical Sales Rep

		differentiate between them. -Students can demonstrate how someone would intervene (and how they would assess if this should be directly or indirectly) to support others who are experiencing difficulties online. -Students can give examples of effective strategies which might help themselves or others **3. Online relationships** - students can describe the benefits of communicating with a partner online - they can explain how relationships can safely begin (online dating), develop, be maintained, changed and end online - they can recognise harmful language of a discriminatory nature and harassment online and can support people if this occurs (e.g. homophobia, name-calling, threatening to 'out'		how bullying and other aggressive behavior relates to legislation. **Online relationships:** Students explore how technology shapes communication styles and identifies strategies for positive relationships in online communities. They are given the opportunity to discuss relationships, respecting, giving and denying consent and behaviours that may lead to harm and how positive interaction online can empower and amplify voice. **Privacy and security:**					Resilience is taught through the lessons when students are pushed to achieve their best, moving out of their perceived limits at times and getting the deserved rewards as a result.		

		someone, threatening violence) - students can describe different ways someone can give, gain or deny consent online and explain why context is important for assessing this - they can explain the differences between active, passive and assumed consent online - they can explain why we have a collective responsibility to gain content before sharing or forwarding information online (e.g. personal details, images etc) -they can give examples of how to make positive contributions to online debates and discussions They can give examples where positive contributions have effected change in an online community **4. Privacy and Security and Copyright** -Students know that accessing some		Students will explore how personal online information can be used, stored, processed and shared. They will learn both behavioural and technical strategies to limit impact on privacy and protect data and systems against compromise. **Copyright and ownership:** Students will explore the concept of ownership of online content and explore strategies for protecting personal content and crediting the rights of others as well as addressing potential consequenc							

		websites or services may increase the risk of encountering viruses and other types of malware - They can demonstrate ways in which someone can change their browser settings to make their online browsing more secure (e.g. cookie permissions, do-not-track-me, password storage, incognito). -They can explain app permissions and analyse them to make informed choices on which apps to use. - They can explain how the security of devices connected to the internet may be compromised, e.g. webcams, monitors, phones or toys. They can demonstrate actions that can be taken to minimise such compromise (e.g. covering cameras on computers when not in use). -Students understand the concept of software and content licensing -They can understand		es of illegal access, download and distribution.							

		and explain the principles of fair dealing and apply this to real case studies from their own research - They can identify the potential consequences of illegal access or downloading and how it may impact them and their immediate peers - They can explain why controlling copyright of their content may be limited when using social media, website and apps **5. Test** Test based around all 5 strands and objectives									
HT6	Mobile app development	1.App for that think of an app that could do good in the world opportunity to decompose the problem sign into code.org to become used to the App Lab environment. 2.Tappy Tap App concept of event-driven programming and applying the paradigm	Know code.org And the App Lab environment. event-driven programming pair programming		Some students may not be able to think of an app that could do good in the world	KS2 – Connecting Computers Events and actions Selection in physical computing Variables in games		Begin creating an app that could do good in the world			

		to the app coding environment and first steps using live coding pair programming to develop the app 3.School Lab Studios spot and fix the errors work on the score screen screen designs to complete 4.User input how user input is captured and processed adding code to a prebuilt app to deal with user input decompose the app into more manageable steps document and reflect on their progress	fix common coding errors value of a variable into an object decomposition to break down a large problem input, create a sequence and variable in block-based programming language		Students may find live coding difficult Some students may find it difficult to spot and fix common coding errors			Programming for app almost completely developed Fully completed screen designs Complete reflection of app after decomposing it			

		5.App development developing the learners' app projects building their apps using pair programming 6. assessment through a multiple-choice test	pair programming building apps multiple-choic e test		Some student not understandin g decompositio n to break down a large problem some students may struggle with pair programming			Fully built and completed app			

Skills developed throughout the programme

Cognitive skills
● Non-routine problem solving – expert thinking, metacognition, creativity.
● Systems thinking – decision making and reasoning.
● Critical thinking – definitions of critical thinking are broad and usually involve general cognitive skills such as analysing, synthesising and reasoning skills.
● ICT literacy – access, manage, integrate, evaluate, construct and communicate.

Interpersonal skills
● Communication – active listening, oral communication, written communication, assertive communication and non-verbal communication.
● Relationship-building skills – teamwork, trust, intercultural sensitivity, service orientation, self-presentation, social influence, conflict resolution and negotiation.
● Collaborative problem solving – establishing and maintaining shared understanding, taking appropriate action, establishing and maintaining team organisation.

Intrapersonal skills
● Adaptability – ability and willingness to cope with the uncertain, handling work stress, adapting to different personalities, communication styles and cultures, and physical adaptability to various indoor and outdoor work environments.
● Self-management and self-development – ability to work remotely in virtual teams, work autonomously, be self-motivating and self-monitoring, willing and able to acquire new information and skills related to work.