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	Cybersecurity	1.You and your data understand the value of data to companies data companies collect from their users and how they use it the law regarding data protection 2.Social engineering how humans can be a weak point in the system consequences of the scams and how to avoid becoming a victim 3.Script kiddies hacking and the techniques used by	Data data privacy DPA human errors' security risks to data strategies to minimise the risk of data being compromised through human error brute force attacks,	Students show respect towards each other, their teacher and the wider community. Students exhibit wisdom when they 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	Some users may not understand the value of data to companies Students may not understand the consequences of Social engineering scams Students may not understand the ethics	KS2 – The Internet Communication	KS4 - BTEC Tech Award DIT Component 3: Effective Digital Working Practices KS4 - BTEC Tech Award DIT Component 3: Effective Digital Working Practices KS4 - BTEC Tech Award DIT	A complete understanding of the law regarding data protection Student can advise consequences of Social engineering scams and how to avoid becoming a victim Student is able to verbalise the Computer	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

		hackers to exploit computer systems ethics behind hackers' actions 4.Rise of the bots malware categories understanding how malware works potential malware damage web bots and what task they perform on the internet how bots are used in conjunction with malware 5.There's no place like 127.0.0.1 risks that cyberthreats pose to a network, common methods of defending a network against attacks	hacktivists, script kiddies, DDoS attacks Computer Misuse Act Consequences of hacking malware malicious bots impact on societal issues firewalls and anti-malware security threats potential impact to organisations	learning and courage to attempt new tasks and complete current ones. Misconceptions are corrected and challenged at an appropriate lev el.	behind hackers' actions Students may not understand how malware works Some students may not grasp the risks that cyberthreats pose to a network		Component 3: Effective Digital Working Practices KS4 - BTEC Tech Award DIT Component 3: Effective Digital Working Practices KS4 - BTEC Tech Award DIT Component 3: Effective Digital	Misuse Act and explain the consequences of hacking Can explain how bots are used in conjunction with malware Full understanding of methods used by network managers to reduce risk	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

		common threats that exist globally methods used by network managers to reduce risk 6.Under Attack plan their defence strategy on a tight budget before cyberattacks start to happen 7.end-of-unit assessment	networks protected from common security threats methods to prevent cyberattacks Literacy Communication Self management Non-routine problem solving – expert thinking, metacognition, creativity Systems thinking – decision making and reasoning Critical thinking –		Students may not understand the methods to prevent cyberattacks		Working Practices KS4 - BTEC Tech Award DIT Component 3: Effective Digital Working Practices	Complete a budget for a cyber-defence strategy	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.		

			analysing, synthesising and reasoning skills Evaluation Justification								
HT2	**Data science**	1.Delving into data science introduce the learners to data science 2.Global data advances in technology to collect, store, and analyse large data sets use global data sets, make predictions, use visualisations of the global data to prove/disprove predictions investigate anomalies and outliers in data. 3.Statistical state of mind	visualise data sets look for patterns or trends advances in technology read global data sets Define ‘correlation’ and ‘outliers’		Students may find it difficult to visualise data sets Students may have difficulty to prove/disprove predictions of global data Students may have difficulty implementing steps of the	KS2 – The Internet Communication Data logging Branching databases	KS4 - BTEC Tech Award DIT Component 2: Collecting, Presenting and Interpreting Data KS4 - BTEC Tech Award DIT Component 2: Collecting, Presenting and Interpreting Data KS4 - BTEC Tech Award DIT	Student can easily find patterns or trends in data Student can locate anomalies and outliers in data Completely and correctly refine a problem into		We encourage students to read newspapers We encourage students to watch the news Current affairs are incorporated into lessons Make links to ‘real life’	

		investigative cycle PPDAC (problem, plan, data, analyse, conclusion highlight correlations in data and investigate outlying data refine a problem into questions they can investigate, visualise data, analyse, and report 4.Data for action first two steps of the cycle (problem and plan) make an electronic data capture form 5.Clean it up the data and analysis steps of the PPDAC cycle problems that inaccurate data can pose for data analysis uploading cleaned data to CODAP	investigative cycle implement steps of the investigative cycle steps of the investigative cycle data capture form need for data cleansing data cleansing technique Visualise a data set		investigative cycle Some students may find difficulty to make an electronic data capture form Some students may not understand the problems that inaccurate data can pose for data analysis Some		Component 2: Collecting, Presenting and Interpreting Data KS4 - BTEC Tech Award DIT Component 2: Collecting, Presenting and Interpreting Data KS4 - BTEC Tech Award DIT Component 2: Collecting, Presenting and Interpreting Data	questions Can complete all steps of the investigative cycle Correct, uploaded cleaned data to CODAP			

		6.Make a change final steps of the PPDAC cycle (analysis and conclusions) 7.end-of-unit assessment	Visualise, Analyse visualisations to identify patterns, trends, and outliers conclusions and report findings Literacy Communication Self management Non-routine problem solving – expert thinking, metacognition, creativity Systems thinking – decision making and reasoning Critical thinking – analysing, synthesising and		students may find it difficult to analyse visualisations to identify patterns, trends, and outliers		KS4 - BTEC Tech Award DIT Component 2: Collecting, Presenting and Interpreting Data	Can complete all steps of the investigative cycle with conclusions and report findings			

			reasoning skills Evaluation Justification								
HT3	Animations	1.Move, rotate, scale, colour impact of 3D animation on the wider world making models in Blender .3D modelling 2.Animation, names, parenting How 3D digital animations are made. explain the differences between keyframing and stop motion animation, reasons for why keyframing might be preferable	deleting and adding objects; moving, rotating, scaling, and colouring naming and reuse of colours, and the computer programming concept of variables Add, move, and delete keyframes to make basic animation Play, pause, and move through the animation using the timeline parenting		Students may not be aware of the impact of 3D animation on the wider world Some students may not be able to explain the differences between keyframing and stop motion animation Some	KS2 – Photo-editing Video-editing 3D Modelling	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, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct and know how to report concerns	Lead explanations of: Photo-editing Video-editing 3D Modelling Can describe and display how 3D digital animations are made. Can use and		We encourage students to read newspapers We encourage students to watch the news Current affairs are incorporated into lessons Make links to ‘real life’	

		3.Complex models and colours more complex modelling techniques to build realistic-looking models. 4..Organic modelling covers modelling techniques that are used to make organic/natural-looking models 5.Lights, camera, render set up a film shot for rendering Range of lights available in Blender, how to set up a camera for a shot, the benefits and drawbacks of using ray tracing in films.	Use edit mode and extrude loop cut and face editig Apply different colours Use proportional editing Use the knife tool Use subdivision Add and edit set lighting Set up the camera Compare different render modes		students may find it difficult to build realistic-looking models Some students may not be able to access modelling techniques that are used to make models Some students may have difficulty setting up a camera for a shot			show tools to build realistic-looking model Can display examples of tools used for modelling techniques Able to state and describe the benefits and drawbacks of using ray tracing in films			

		6.Project create a 3–10 second video self-assess against a set of skills peer to assess work when it is completed Assessment	Create a 3–10 second animation Render out the animation Literacy Communication Self management Critical thinking – analysing, synthesising and reasoning skills Evaluation Justification		Some students may have had difficulty creating a 3–10 second video			Able to assist with knowledge and rendering skills			
HT4	Representations: from clay	1.Across time and space	representations used to store,		Some students may struggle with	KS2 – Communication	Create, reuse, revise	Will already have a grasp of binary			

	to silicon	discuss familiar examples of representations binary representations in the context of computing 2.Lights and drums activity that requires to encode, transmit, and decode short messages using different coding scheme and communication how different symbols are embodied in physical media. 3.Binary digits Bits are familiar sets of symbols such as letters and decimal digits connection between (alphanumeric) information and its binary representation bits used in conjunction with computing systems.	communicate and process information different representations appropriate for different tasks characters as sequences of symbols examples of character coding schemes symbols carried on physical media what binary digits (bits) are length of a sequence of bits equals number of bits that it contains		examples of representations Some students may have difficulty seeing how different symbols are embodied in physical media Students may not fully understand the connection between (alphanumeric) information and its binary representation		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, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct and know how to report concerns	representations in the context of computing Will lead lesson as able to encode, transmit, and decode short messages using different coding schemes Can Explain how bits are used in conjunction with computing systems			

		4.Numbers in binary how numbers can be represented using binary become familiar with binary number representation convert between binary and decimal.	natural numbers represented as sequences of binary digits Convert a decimal number to binary Convert a binary number to decimal		Some students may not be able to convert a decimal number to binary and vice versa			Able to assist others to convert a decimal number to binary and vice versa			
		5.Large quantities bytes and the prefixes used for measuring representation size, such as ‘kilo-’, ‘mega-’, ‘giga-’ and ‘tera-’. conversions between the different units and multiples.	Convert between different units and multiples of representation size represented in digital devices		Some students may have difficulty understanding different units and multiples of representation size			Able to assist others to convert between the different units and multiples.			
		6.Turing’s mug puzzle activity that challenges learners to unchain Alan Turing’s mug.	Literacy Communicati		Some students may struggle with the puzzle activity			Able to assist others to unchain Alan Turing’s mug activity			

		summative assessment quiz	on 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								
HT5	SWGFL	**1 Online reputation and Online relationships* change of theme for Y9 to include sexting** - I can monitor and manage my online reputation and I can describe clear steps to ensure that it promotes a positive image	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*	Wisdom to know how to be safe online and to have the courage to ask for help when needed **Online reputation:** Students will	How to report issues such as sexting That images will not be looked at That the students will never be 'told off' or 'blamed'	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	From an environmental standpoint students are encouraged to understand the ways that computer systems and parts can be recycled, reused and	We encourage students to read newspapers We encourage students to watch the news Current	The skills learned from completing KS3 will provide background and knowledge for students to progress into work roles and be computer

		- I can identify some of the key laws governing online behaviour and reputation and the potential criminal implications of breaking them - I can give examples of how harmful sexual behaviour that can occur and can critically assess the potential harm - I can explain what is meant by making and sharing explicit images and videos (e.g. nudes and upskirting). I can identify different contexts in which this can happen (e.g. consensual, non-consensual), explain a range of possible impacts and identify strategies for seeking help - I can describe the laws that govern online behaviour and how they inform what is acceptable or legal (e.g, sexting,and related terminology, trolling, harassment, stalking) **2 Online Bullying** - I can explain how cruelly and unpleasant comments can escalate	*Collective worship and PSCHE* Communication skills - class discussions Literacy skills - literacy tasks in line with school policy	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. **Online relationships:** Focus on sexting for the Y9 students and the implications of this - discusses consent and positive online relationships and how to report.	Actions that can be taken if laws have been broken (e.g for online bullying) Legal consequences of copyright and hacking			topics will form a par of the challenge tasks	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 well with school rules also being adhered to and considered at all times. Individual Liberty – It is important to have students	affairs are incorporated into lessons Make links to 'real life'	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 Network Engineer IT Consultant Technical Sales Rep

		quickly online - I can explain the concept of dishibilitation online and can explain how this can be problematic - I can explain and assess a variety of routes to report bullying both in school and at home that include social reporting, peer support, anonymous reporting routes and helpline services - I can describe some of the laws that govern online behaviour and bullying and the potential implications of breaking them - I can explain what actions I can take if I believe these laws have been broken **3 Privacy and Security** - I can identify choices and demonstrate strategies to control the personal data online services hold - I can explain why it's important to know how to recover a device or account if it gets compromised/hacked		**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 how bullying and other aggressive behavior relates to legislation. **Privacy and security:** Students will explore how personal online information can be used, stored, processed and shared. They will learn both behavioural and technical strategies to					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 Resilience is taught through the lessons when students are pushed to achieve their best, moving out of their perceived limits at times and		

		- I can explain that hacking can have legal consequences - I know who people can report to if they have experienced a cyber problem (e.g. identity theft, ransomware) **4 Copyright** **-** I understand creative commons licencing protocols - I can demonstrate simple ways in which I can protect my own work from copyright theft - I can evaluate the possible impact of legal and illegal downloading on those people who create online content and the consequences for the wider community **5 Test** Testing on the various outcomes from this term		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 consequences of illegal access, download and distribution.					getting the deserved rewards as a result.		
HT6	Representations: going audiovisual	1.Binary mosaic digital mosaics are aligned in rows and columns, with the colour of each element represented as a sequence of binary digits	colour of each picture element is represented using a sequence of binary digits		Some students may not be able to create digital mosaics pixel by pixel	KS2 - Sequence in music	KS4 - BTEC Tech Award DIT Component 1: Exploring User Interface Design	Able to assist others to create digital mosaics			

		create digital mosaics pixel by pixel how images in daily life translate to nothing more than long strings of bits. 2.A splash of colour colour represented as a mixture of red, green, and blue: the level of each of these colours in the mixture is represented using an 8-bit sequence that produces a total of 24 bits to represent the colour of any single pixel	‘pixels’, ‘resolution’, and ‘colour depth’ image represented as a sequence of bits colour represented as a mixture of red, green, and blue, with a sequence of bits representing each colour’s intensity representation size of a digital image, by multiplying resolution (number of pixels) with colour depth (number of bits used to represent the colour of individual pixels)		Some students may not be able to create digital mosaics pixel by pixel		Principles and Project Planning Techniques 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, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct and know how to report concerns	Able to assist others to create digital mosaics			

		3.Collage use appropriate software to perform a range of image manipulation functions and complete specific tasks and challenges	representation size Vs perceived quality for digital images basic image editing tasks combine them in order to solve more complex problems requiring image manipulation manipulation of digital images = arithmetic operations on their digital representation creative benefits and ethical drawbacks of digital manipulation		Some students may have difficulty using appropriate software to perform a range of image manipulation functions			Can understand and verbalise creative benefits and ethical drawbacks of digital manipulation			

		4.Good vibrations analogue to digital conversion: samples, sampling rate, and sample size how sound is captured, digitised, manipulated, and reproduced in digital devices.	‘sample’, ‘sampling frequency/rate’, ‘sample size’ sounds represented as sequences of bits		Some students may have difficulty with analogue to digital conversion			Understands and can verbalise that sounds are represented as sequences of bits			
		5.Sonic playground digitisation process to understand how the sampling rate and the sample size affect the size and quality of the representation sound editing program	use of sound editing software sampling frequency sample size representation size and perceived quality, basic sound editing tasks		Some students may not understand how the sampling rate and the sample size affect the size and quality of the representation			Can complete and assist others with basic sound editing tasks			
		6.Always another way alternative (symbolic) representations for images and sound, e.g. vector graphics and MIDI music	bitmap images and pulse code sound are not the only binary representations of images and sound available		Some students may not realise there are alternative (symbolic) representations for images and sound			Understands why compression is necessary and can explain process and give examples.			

		summative assessment	Why is ‘compression ’ necessary?								

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.