Computing Curriculum Justification – Year 9

The curriculum is designed to cover 5 topics throughout the year. The topics will cover 7 lessons per topic which is 35 sessions throughout the year. This will allow time to complete end of term Summative Assessments based on learning that has already taken place.

Year 9		Topic 1 ½ Term 1	Topic 2 ½ Term 2 - 3	Topic 3 ½ Term 3-4	Topic 4 ½ Term 4-5	Topic 5 ½ Term 5-6
Computing	**Topic** Big Idea/Question	**Python – Text based coding** **Strands Undertaken:** IT Digital Literacy Computer Science	**Project based learning – KS4 introduction – DIT** **Strands Undertaken:** IT Digital Literacy Computer Science	**Cybersecurity** **Strands Undertaken:** IT Digital Literacy	**Data Science** **Strands Undertaken:** IT Digital Literacy Computer Science	**Data Representations** **Strands Undertaken:** IT Digital Literacy
	Software to be used	PowerPoint Word **Internet** **Trinket** **Code Editor**	PowerPoint Word Adobe **Internet**	PowerPoint Word **Internet**	PowerPoint Word **Internet** **Excel**	PowerPoint Word **Internet**
	Why this and why now? What is the content doing here? How does it integrate to prior learning or prepare students for future learning? Is it an opportunity for cumulative	This is the third programming unit to retrieve and build on prior Year 8 learning. It will introduce students to more advanced python aspects and build on earlier learning. It will give students a broader knowledge of Python programming language which students will need if they are going to	**This unit is to give students an idea of the type of work they will be doing if they pick DIT / CS at KS4.** **It will develop skills needed to be successful in those subjects and it is also designed to encourage students to take those subjects.** **This unit has lijnks to Digital Literacy and**	This unit takes the learners on an eye-opening journey of discovery about techniques used by cybercriminals to steal data, disrupt systems, and infiltrate networks. **This unit develops skills from previous units:** o **Y7 – Networks** o **Y8 – Representations**	This unit of work introduces learners to how computing can be used to analyse data, the different methods of analysing data. **This unit develops skills from previous units:** o **Y7 – Data Modelling** o **Y8 – Computing Systems** o **Y8 – Representations**	In this unit, learners will focus on digital media such as images and sounds, and discover the binary digits that lie beneath these types of media. Just like in the previous unit, where learners examined characters and numbers, the ideas that learners need to understand are not really new to them.

learning or to achieve proficiencies? Does it provide a step to collective sufficiency?	choose to do Computer Science in KS4. **This unit develops skills from previous units:** ○ **Y7 – Networks** ○ **Y7 – Data Modelling** ○ **Y8 – Computing Systems** ○ **Y8 – Representations** ○ **Y8 - Python** **This unit develops skills and knowledge that will be used in the following topics:** **NA**	**application of software to be used at KS4**	**This unit develops skills and knowledge that will be used in the following topics:** ○ **Y9 – Data Science** ○ **Y9 - AI** ○ **Y9 – Representations**	**This unit develops skills and knowledge that will be used in the following topics:** ○ **Y9 - AI** ○ **Y9 – Representations**	The unit clearly links with the representations unit covered in Y8. **This unit develops skills from previous units:** ○ **Y8 – Representations** ○ **Y8 – Animations** ○ **Y8 – Vector Graphics** **This unit develops skills and knowledge that will be used in the following topics:** **NA**
What is the essential knowledge that needs to be remembered? What are the key facts, skills, and experiences that you want students to remember? What are the substantive and disciplinary concepts? Does the knowledge selected mean students leave with a good understanding?	**Learners will be able to:** • Identify the list operations and apply them to perform tasks. • Use iteration using while loops. • Know and understand the similarities between lists and strings. • Apply string operations in an iterative context. • Know and understand how to use a for loop. • Use a for-loop to iterate over list items. • Know about operations relating	**Learners will be able to**: assess user interfaces and identify key aspects: • Is intuitive and could be improved • Uses efficient interaction techniques (e.g., keyboard shortcuts, large buttons) • Learners must design at least four screens that: • Meet all user, input/output, and accessibility requirements • Include visualisation methods (e.g., sketches, wireframes)	**Learners will be able to:** identify many aspects of a Cyber Security. This will include: • Methods to access personal data • Methods to prevent access eg. Firewall, anti-malware software. • Privacy and privacy laws • Global cyber threats Learners will be able to explain each aspect and give examples of how to protect themselves against cyber threats.	**Learners will be able to:** • Visualising data in different formats. • Understand the difference between data and information. • Make predictions from a data set. • Create a data set. • Analyse a data set. • Use the Investigative Cycle PPDAC (problem, plan, data, analyse, conclusion) to analyse a data set. • Identify trends in data, including global trends.	**Learners will be able to:** • Explain how digital images and sounds can be represented using binary. • Identify how each pixel in an image has a binary code and be able to identify how colour depth can affect the quality of the image. • Calculate the size of images based on the number of bits • Understanding analogue to digital conversion: samples, sampling rate, and sample size.

Substantive – key facts Disciplinary- Methods of subjects Procedural- Skills	to length, membership, and access to individual characters. • Apply these string operations in an iterative context	• Specify hardware / software requirements • Create a fully functional interface tailored to user and device needs • Show how users input, receive output, and navigate • Gather user feedback and make iterative improvements with clear documentation			• Understand the digitisation process • Modify a sound sample
What is the assessment intent and how will you assess? What types of assessments and question stems are being used to demonstrate students are learning and progressing to produce ever higher standards of work? What formative assessment is there for component learning and summative for	Ongoing formative assessment to include questioning, peer and self-assessment, mini quizzes plenaries and use of mini WB etc to check for misconceptions and inform learning. Summative assessment will take place at the end of the unit of work based on topics learned. Assessments will be holistic to include learning from previous components to interrupt the forgetting curve as well as provide opportunities for development feedback.	Assessment will take the form of a fully completed PowerPoint product that meets the criteria set out. The interactive powerpoint will have the following aspects: • 4 slides • Navigation • Images • Animation / video • Information • Consistency : o Fonts o Background o Colours o House style	Ongoing formative assessment to include questioning, peer and self-assessment, mini quizzes plenaries and use of mini WB etc to check for misconceptions and inform learning. Summative assessment will take place at the end of the unit of work based on topics learned. Assessments will be holistic to include learning from previous components to interrupt the forgetting curve as well as provide opportunities for development feedback.	Ongoing formative assessment to include questioning, peer and self-assessment, mini quizzes plenaries and use of mini WB etc to check for misconceptions and inform learning. Summative assessment will take place at the end of the unit of work based on topics learned. Assessments will be holistic to include learning from previous components to interrupt the forgetting curve as well as provide opportunities for development feedback.	Ongoing formative assessment to include questioning, peer and self-assessment, mini quizzes plenaries and use of mini WB etc to check for misconceptions and inform learning. Summative assessment will take place at the end of the unit of work based on topics learned. Assessments will be holistic to include learning from previous components to interrupt the forgetting curve as well as provide opportunities for development feedback.

composite learning?	There will be a Termly Summative Assessment in line with school policy.		There will be a Termly Summative Assessment in line with school policy.	There will be a Termly Summative Assessment in line with school policy.	There will be a Termly Summative Assessment in line with school policy.

What does the end point look like?
 	
What is the impact of this component on the student's learning? What should the learning now look like via the assessment? Is disciplinary language used?
	Learners will be able to:
	• Write programs that display messages, receive keyboard input, and use simple arithmetic expressions in assignment statements.
	• Use selection (if-elif-else statements) to control the flow of program execution.
	• Locate and correct common syntax errors.
	• Create lists and access individual list items.
	• Perform common operations on lists or individual items.
	• Use iteration (while statements) to control the flow of program execution.
	• Perform common operations on lists or individual **items.**
	• Perform common operations on **strings or individual characters**
		Learners will be able to:
		• Identify what an interface is
		• Identify what an interface should contain
		• Identify the features of an interface that make it appropriate for the project
		• Create an interface that is intuitive
		• Create an interface that includes:
		A. 4 slides (minimum)
		B. Navigation
		C. Images
		D. Information
		E. Consistency :
		  o Fonts
		  o Background
		  o Colours
		  o House style
		• Identify the strengths and weakness of their product and the products of other students
			Learners will be able to:
			
			• Explain the difference between data and information.
			• Critique online services in relation to data privacy.
			• Identify what happens to data entered online.
			• Explain the need for the Data Protection Act.
			• Recognise how human errors pose security risks to data.
			• Identify strategies to be implemented to minimise the risk of data being compromised through human error.
			• Define hacking in the context of cyber security.
			• Explain how a ddos attack can impact users of online services.
			• Identify strategies to reduce the chance of a brute force
				Learners will be able to:
				• Define data science.
				• Explain how visualising data can help identify patterns and trends in order to help us gain insights.
				• Use an appropriate software tool to visualise data sets and look for patterns or trends.
				• Recognise examples of where large data sets are used in daily life.
				• Select criteria and use data set to investigate predictions.
				• Evaluate findings to support arguments for or against a prediction.
				• Define the terms 'correlation' and 'outliers' in relation to data trends.
				• Identify the steps of the investigative cycle.
				• Identify the steps of the investigative cycle.
				• Identify the data needed to answer a question defined by the learner.
					Learners will be able to:
					• Describe how digital images are composed of individual elements.
					• Recall that the colour of each picture element is represented using a sequence of binary digits.
					• Define key terms such as 'pixels', 'resolution', and 'colour depth'.
					• Describe how colour can be represented as a mixture of red, green, and blue, with a sequence of bits representing each colour's intensity.
					• Compute the representation size of a digital image.
					• Describe the trade-off between representation size and perceived quality for digital images.
					• Perform basic image editing tasks using appropriate software.
					• Describe and assess the creative benefits and ethical

	• Use iteration (for statements) to iterate over list items. • Use iteration (for loops) to iterate over lists and strings. • Use variables to keep track of counts and sums. • Combine key programming language features to develop solutions to meaningful problems		attack being successful. • Explain the need for the Computer Misuse Act. • List the common malware threats. • Examine how different types of malware causes problems for computer systems. • Question how malicious bots can have an impact on societal issues. • Compare security threats against probability and the potential impact to organisations. • Explain how networks can be protected from common security threats. Identify the most effective methods to prevent cyberattacks	• Create a data capture form. • Describe the need for data cleansing. • Apply data cleansing techniques to a data set. • Visualise a data set. • Analyse visualisations to identify patterns, trends, and outliers. • Draw conclusions and report findings	drawbacks of digital manipulation. • Recall that sound is a wave. • Define key terms such as 'sample', 'sampling frequency/rate', 'sample size. • Describe how sounds are represented as sequences of bits. • Calculate representation size for a given digital sound, given its attributes. • Explain how attributes such as sampling frequency and sample size affect characteristics such as representation. • Perform basic sound editing tasks. • Recall that bitmap images and pulse code sound are not the only binary representations of images and sound available. • Define 'compression', and describe why it is necessary
How does it cover the NC? Refer explicitly to the NC or KS4	The topic meets the NC statement requirements for strands 3.1/3.2/3.3/3.6	The topic meets the NC statement requirements for strands 3.1/3.5/3.8	The topic meets the NC statement requirements for strands 3.9	The topic meets the NC statement requirements for strands 3.7	The topic meets the NC statement requirements for strands 3.6

	Assessment Objectives.				