St Helena's Church of England Primary School Computing Long Term Plan (Purple Mash and BBC MircoBit)

KS2: Curriculum Coverage Key

Computer Science	Information Technology	Digital Literacy

	KS1		LKS2		UKS2	
	Year A	**Year B**	**Year A**	**Year B**	**Year A**	**Year B**
Term 1 A	Unit 1.4: Lego Builders. 3 x Lessons. Unit 1.8: Spread Sheets. 3 x Lessons.	Unit 1.6: Animated Stories. 5 x Lessons	Unit 3.3: Spreadsheets: 3 x Lessons (over 6 lessons)	Unit 4.6: Animation 3 x Lessons (over 6 lessons).	Unit 4.7 Effective Searching: 3 x Lessons Unit 5.4: Databases 3 x Lessons	Unit 5.3: 3D Modelling: 4 x Lessons
Term 1 B	Unit 2.7: Making Music. 3 x Lessons Unit 1.9: Tech Outside School. 2 x lessons.	Unit 2.6: Creating Pictures. 5 x lessons.	Unit 3.6 Branching Databases: 3x Lessons (over 6 lessons)	Unit 3.4: Typing: 4x Lessons (over 6)	Unit 5.5: Game Creator 5 x Lessons	Unit 6.6: Networks: 3 x Lessons Over whole term
Term 2 A	Unit 1.1 Online Safety OR Unit 2.2 Online Safety (4 lessons over the full half term)	Unit 1.1 Online Safety OR Unit 2.2 Online Safety (4 lessons over the full half term)	Unit 3.2 Online Safety OR Unit 4.2 Online Safety (over the full half term)	Unit 3.2 Online Safety OR Unit 4.2 Online Safety (over the full half term)	Unit 5.2 Online Safety OR Unit 6.2 Online Safety Over whole term	Unit 5.2 Online Safety OR Unit 6.2 Online Safety Over whole term
Term 2 B	Unit 1.5 Maze Explorers: 4 x lessons. (over 6 lessons)	Unit 1.3 Pictograms 3 lessons over whole term	Unit 3.5: Email: 6 x Lessons	Unit 4.9: Making Music 4 x Lessons (over 6 lessons)	Unit 5.3 Spreadsheets: 5 x Lessons	Unit 5.8 Word Processing 8 x lessons. Continue into Term 3 A and extend with publishing school work to apply knowledge.
Term 3 A	Unit 2.8 Presenting Ideas 4xlessons over whole term	Unit 2.5 Effective Searching 3xlessons over whole half term.	Unit 4.10 Artificial Intelligence 4xlessons over whole term.	Unit 3.7 Simulations 3x lessons over whole term.	Unit 6.4 Blogging 4 lessons over half term.	
Term 3 B	Unit 1.7 Coding: 6 x lessons. OR Unit 2.1 Coding 6x lessons (see year group)	Unit 1.7 Coding: 6 x lessons. OR Unit 2.1 Coding 6x lessons (see year group)	BBC Microbit Introduction to coding or BBC Microbit Challenge	BBC Microbit Introduction to coding or BBC Microbit Challenge	BBC Microbit Challenge	BBC Microbit Challenge

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Year A	KS1	LKS2	UKS2
Term 1A Unit 1	Unit 1.4 Lego Builders	Unit 3.3 Spreadsheets	Unit 4.7 Effective Searching
Substantive Knowledge	• To know that to achieve a specific effect when building something, accurate instructions must be followed. • To know that computer programs need precise instructions to follow and these are called algorithms. If instructions are vague, outcomes will vary for any given task. • To know the order of instructions for a task affects the results. • To know that correcting errors in a set of instructions is called debugging.	• To know graphs can be generated from data within a sheet. If data is changed on the sheet, then the graph automatically updates to recognise these amendments. • To know cells all have their own individual address. They are referenced using letters and numbers. • To know that formulas can be added to a spreadsheet to speed up calculations when data is changed.	• To know information can be located on a search engine page. • To know there are different skills needed to research effectively. • To know that web pages need to be evaluated to see if the information contained is true and reliable.
Disciplinary Knowledge	• To know how to recognise whether instructions have been followed correctly when comparing two Lego models. • To know how to give clear, precise and concise building instructions for someone to follow. • To know how important it is to have clear, precise and concise instructions and the implications of this. • To know how to test that instructions have been followed by comparing the results of something built with the instructions. • To know how to open a painting activity on Purple Mash. • To know how to correct a simple algorithm by changing the order.	• To know how to recall the different range of graphs and charts they have come across in other subjects as well as computing including pie and bar; enter data into a table format in a spreadsheet; select all the data in the table; select the chart tool; give the table a title; label the chart axis; add a title to the chart; edit data in a table and see how the chart changes automatically; interpret the data contained within the graph including estimating values between given data sets. • To know how to read and manipulate cell addresses. • To know how to find and use the formula wizard box in 2Calculate.	• To know how to load up a search engine on their device and give the name of a well-known search engine. • To know how to enter a search enquiry and correctly interpret the information outputted. • To know how to enter more advanced and effective search enquires without the need for full sentences. • To know how to analyse the contents of a webpage for clues about the reliability of information.
Term 1A Unit 2	Unit 2.3 Spreadsheets		Unit 5.4 Databases

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Substantive Knowledge	• To know there are specific features and purposes of a spreadsheet, and they can navigate around and enter data. • To know there are specific features in spreadsheets such as 2Calculate allow user to insert content such as images into a cell. The cells content can be locked or moved using additional features. • To know that spreadsheets can be used for calculations.		• To know that a database can be used to search for information. • To know that users can contribute to a collaborative database. • To know databases can be created to cover a range of topics or themes.
Disciplinary Knowledge	• To know how to talk about the function of a spreadsheet and give examples. • To know how to enter numbers and words into a sheet. • To know how to navigate from cell to cell using the arrows or by clicking in the cell. • To know how to add background colour to cells. • To know how to add a given image to a sheet or draw their own. • To know how to select a cell where an image will be inserted and select an image to insert. • To know how to use the + and – to create simple formulas to calculate an amount.		• To know how to: Open an existing database in 2Investigate; click on a record and see how the information is entered; enter data using words and numbers as well as drop down menus; use drop down menus to make the data entry more efficient; sort, group and arrange information in a database; search for information in a database; display information in tabular format and chart form; answer questions involving the interrogation of a database.
Term 1B Unit 1	Unit 2.7 – Making Music	Unit 3.6 Branching Databases	Unit 5.5 Game Creator
Substantive Knowledge	• To know that music can be made digitally using a computer programme. • To know that sounds can be incorporated into music programs to make a melody.	• To know a database is a collection of data organised in a way that can be searched. • To know that objects can be sorted using yes/no questions.	• To know it is important to plan a game before commencing work. • To know a game design programme has specific features for the designer to use.

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	• To know that the speed of digital musical composition (tempo) can be altered.	• To know databases can be created using computer programmes. • To know the importance of testing and debugging a database for/with errors.	• To know the design of characters and quest items is a key aspect of game creation. • To know a finished game must be possible for the player to complete.
Disciplinary Knowledge	• To know how to open 2Sequence. • To know where to locate and volume of a sound or composition. • To know how to manipulate a composition to affect its sound. • To know how to play the sounds from different instruments and layer them in a composition.	• To be able to explain what a database is. • To know how to identify questions that can be used to sort physical objects. • To know how to sort objects using yes/no questions. • To know how to use the 2Question programme to insert question text with choice buttons and include an image of the object.	• To know how to evaluate other games against criteria before beginning the creative process. • To know how to use the key features of the game creator tool. • To know how to design an effective game that fits a brief. • To know how to incorporate images and sounds into their games. • To know how to evaluate their own game and evaluate those of others against technical criteria.
Term 1B Unit 2	Unit 1.9 Technology outside the classroom.		
Substantive Knowledge	• To know technology is scientific knowledge put into practical use to solve problems. • To know that technology is used in school. • To know technology is used out of school.		
Disciplinary Knowledge	• To know how some common types of technology function. • To know how to identify common types of technology.		
Term 2A Unit 1	Unit 1.1 or 2.2 Online Safety	Unit 3.2 or 4.2 Online Safety	Unit 5.2 or 6.2 Online Safety
Substantive Knowledge	• To know the importance of keeping passwords safe • To know many online platforms have a space for their work to be accessible	• To know everything put online leaves a trail known as a digital footprint. • To know safe protocols can be developed when using email.	• To know the SMART rules that are designed to keep children safe online. • To know passwords need to be kept secure and what makes a secure password.

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	• To know an avatar is a virtual representation of them to use online. • To know different icons in a tools bar carry out different functions. • To know a digital footprint is the information an individual puts online.	• To know there are risks and benefits with installing software including apps. • To know some of the positive and negative impacts of technology on health and the environment. • To know copying the work of others is plagiarism.	• To know care needs to be given when sharing content online. • To know there are different forms of communication with different uses. • To know sources should be referenced in work (including images).
Disciplinary Knowledge	• To know how to access Purple Mash at home and at school safely. • To know how to save and access their work. • To know why an avatar is safer for an online account. • To know how to locate and use the search bar. • To know how to use a variety of tools including writing frames. • To know and be able to discuss what a digital footprint is.	• To be able to identify emails that may be spam. • To know how to use the padlock on a web address bar to indicate a safe website. • To recognise that everything posted online remains online. • To be able top identify plagiarism in text and discuss.	• To know how following SMART rules can keep users safe when online. • To know how to create a strong password involving letters, numbers and special characters. • To know how to assess what information should be shared online. • To know how to reference sources in their work to avoid plagiarism.
Term 2 B Unit 1	Unit 1.5 Maze Explorers	Unit 3.5 Email	Unit 5.3 Spreadsheets
Substantive Knowledge	• To know you can move a character within specific computer programmes by using direction keys (and know this is a command/instruction) • To know number keys can be combined with direction keys to give more accurate instructions. • To know lists can be made with directional instructions and these are known as algorithms.	• To know there are different methods of communication and they each have strengths and weaknesses. • To know that emails are electronic versions of letters and can be sent and received almost instantly to others with an email address. • To know to use email systems safely. • To know pictures, documents and other file types can be attached to emails.	• To know a formula can be written in a sheet to convert units of length and distance. • To know a spreadsheet can be used to model a real-life problem. • To know a spreadsheet can be used to investigate a problem. • To know spreadsheets can be created to support the organisation of real-life events.
Disciplinary Knowledge	• To know how to open the 2Go app and be familiar with its environment. • To know how to use the direction keys on an iPad to manipulate a character.	• To know how to identify the attachment icon, attach files and send these in an email to another user. • To know to be cautious about a received email with an attachment.	• To know how to write simple formula for converting cm to m using cell references. • To know how to drag formula from one cell to adjoining cells.

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	• To know how to drag instructions into the algorithm box and run a test on these instructions. • To know how to use the undo button to help with changes to commands.	• To know how to recognise a concerning email/contact. • To know how to report a concern to a trusted adult. • To know some potential purposes and audiences of an email.	• To use written formula (such as for calculating area/perimeter) to solve a problem. • To know how to use the count tool to count the number of rolled dice. • To know how to use the graphing functionality to display results on screen. • To know how to use formulae to analyse simple sets of data.
Term 3 A Unit 1	Unit 2.8 – Presenting Ideas	Unit 4.10 – Artificial Intelligence	Unit 6.4 Blogging
Substantive Knowledge	• To know that digital content can be presented in many forms. • To know that quizzes can be made using programmes such as 2Quiz. • To know that digital content should be presented using a suitable format.	• To know that artificial intelligence is having an impact on day-to-day life. • To know artificial intelligence can assist and benefit us in every day life. • To know the potential of artificial intelligence is limitless. • To know artificial intelligence is already being used to create music and art.	• To know that a blog is an online vehicle for displaying thoughts and ideas. • To know it is important to plan a theme and content for a blog before writing it. • To know people can contribute to blogs by adding their own posts.
Disciplinary Knowledge	• To know how to compare a traditional book with an eBook and talk about the difference. • To know how to open and identify the key areas (including introductory screen, delete, clone and add question icons) of 2Quiz. • To know how to compare a digital mind map in 2Connect and a digital fact file in 2Publish.	• To know how to define artificial intelligence in their own words. • To know how to think critically about artificial intelligence and consider its future. • To know how to discuss the advantages and disadvantages of artificial intelligence.	• To know how to plan out a blog post on a given theme using a concept map. • To know how to open the blogging tool and create their own blog. • To know how to add a comment to a blog post written by another person.
Term 3B Unit 1	Unit 1.7/2.7 Coding	BBC Micro bit introduction.	BBC Micro bit Challenges
Substantive Knowledge	• To know tasks can be given to people and computers using instructions, known as algorithms.	• To know the micro:bit is a tiny computer which needs instructions in code to make it work.	In successive years, children build their substantive knowledge about the practical ways the devices can be used. Challenges from the BBC Micro bit platform have been designed for

	• To know there are objects and action code blocks in the 2Code app that can be used to make a simple programme. • To know an event is something that makes a block of code run. • To know that debugging is when a code is fixed if it is not working in the way it was designed.	• To know that sets of instructions for computers in a sequence are also called algorithms or programs. • To know the micro:bit has an LED display output which it can use to show words (as well as numbers and pictures). • To know that sequence and timing is important when making an animation. • To know that animations create an illusion of movement by showing a sequence of still images. • To know how sensor inputs from the accelerometer can be used to detect movement, such as when a step is taken. • To know that variables are used to keep track of the current step count. • To know how inputs, outputs, and computer code work together to make control systems. • To know how logic (conditional 'if… then… else' instructions) is used to make different outputs happen depending on changes in data from a sensor.	different levels of challenge and application, and so as a school, each class teacher should chose projects based on the needs of their class, and differentiate these within a lesson for specific computing partners who need to be stretched or supported.
Disciplinary Knowledge	• To know how to give clear instructions others can follow. • To know how to draw symbols that represent instructions. • To know how to recognise an object and an action in a printed code block. • To know how to make a command in 2Code by using an object and action together.	• To know how to connect the Micro:bit to a device such as an iPad or Laptop. • To know how to use the MakeCode editor to create instructions in code that the micro:bit can understand and then transfer them to the micro:bit. • To know how the micro:bit has an LED display output which it can use to show	In successive years, children build their substantive knowledge about the practical ways the devices can be used. Challenges from the BBC Micro bit platform have been designed for different levels of challenge and application, and so as a school, each class teacher should chose projects based on the needs of their class, and differentiate these within a lesson

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	• To recognise "when clicked", "before" and "after" within a code and the affect they have on the output. • To know how to delete lines of code that do not work or have been mis-used.	words (as well as numbers and pictures). • To know how to code the micro:bit to show simple animations on its LED display output. • To know how to use loops to make animations run longer using fewer instructions. • To know how to use 'forever' infinite loops to keep control systems responding to changes in the environment.	for specific computing partners who need to be stretched or supported.
Year B	KS1	LKS2	UKS2
Term 1A Unit 1	Unit 1.6 Animated Stories	Unit 4.6 Animation	Unit 5.3 Digital 3D Modelling
Substantive Knowledge	• To know there a difference between traditional books and eBooks. • To know that images can be created within eBook software. • To know animations can be included in eBooks. • To know audio files can be added to an eBook. • To know that backgrounds can engage and audience. • To know text fonts and sizes can be changed in an eBook to suit an audience.	• To know some animations are created by hand and others with the help of technology. • To know "onion skinning" is a term used in animation and can make the animation process more efficient. • To know sound can be added to animation to enhance the finished product. • To know the term "stop frame animation" refers to animation where the stopping and stating of a camera gives an object the impression of movement.	•
Disciplinary Knowledge	• To know how 2CreateAStory can be used to create an eBook. • To know how to use digital textured pens to create images.	• To know how to make a simple flip animation book. • To know how to create a simple moving object o Purple Mash using 2Animate. To know how to use the onion skinning tool and discuss why an animator might use it.	

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	• To know how to use the eraser, undo/redo buttons when creating images. • To know how to save and retrieve their work. • To know how to identify and test the animation tools. • To know how to apply a simple animation effect. To know how to add and delete pages in a file. • To know how to locate, record and inset a sound file from the gallery. • To know how to locate the camera icon and use this to apply an image taken from a camera.		
Term 1B Unit 1	Unit 2.6 Creating Pictures	Unit 3.4 Typing	Unit 6.6 Networks
Substantive Knowledge	• To know computer drawing programmes contain colour pallets. • To know the size of an on screen painting tool brush stroke can be manipulated. • To know the intensity of colours can be manipulated. • To know fill tool speed up the process of colouring enclosed areas. • To know the pattern tool can be used to create repeating patterns and manipulate how a pattern is arranged.		
Disciplinary Knowledge	• To know how to open 2Paint and select a painting effect. • To know how to use the colour palette to select different colours. • To know how to produce a range of paintings formed from different effects.		

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	• To know how to use to tool slider to manipulate the sizes of brush strokes. • To know how to locate the fill tool. • To know how to change the arrangement of the pattern using 2Paint's options.		
Term 2A Unit 1	Online Safety	Online Safety	Online Safety
Substantive Knowledge	• To know the importance of keeping passwords safe • To know many online platforms have a space for their work to be accessible • To know an avatar is a virtual representation of them to use online. • To know different icons in a tools bar carry out different functions. • To know a digital footprint is the information an individual puts online.	• To know everything put online leaves a trail known as a digital footprint. • To know safe protocols can be developed when using email. • To know there are risks and benefits with installing software including apps. • To know some of the positive and negative impacts of technology on health and the environment. • To know copying the work of others is plagiarism.	• To know the SMART rules that are designed to keep children safe online. • To know passwords need to be kept secure and what makes a secure password. • To know care needs to be given when sharing content online. • To know there are different forms of communication with different uses. • To know sources should be referenced in work (including images).
Disciplinary Knowledge	• To know how to access Purple Mash at home and at school safely. • To know how to save and access their work. • To know why an avatar is safer for an online account. • To know how to locate and use the search bar. • To know how to use a variety of tools including writing frames. • To know and be able to discuss what a digital footprint is.	• To be able to identify emails that may be spam. • To know how to use the padlock on a web address bar to indicate a safe website. • To recognise that everything posted online remains online. • To be able top identify plagiarism in text and discuss.	• To know how following SMART rules can keep users safe when online. • To know how to create a strong password involving letters, numbers and special characters. • To know how to assess what information should be shared online. • To know how to reference sources in their work to avoid plagiarism.
Term 2 B Unit 1	Unit 1.3 Pictograms	Unit 4.9 Making Music	Unit 5.8 Word Processing
Substantive Knowledge	• To know that data is a collection of information used to help answer questions.	• To know there are some main elements of music including rhythm, tempo, pitch and texture.	

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	• To know a pictogram is a visual way of representing date. • To know computer programmes can be used to create pictograms.	• To know a piece of music can be altered by changing the rhythm and tempo. • To know a melodic phrase can be created using music software.	
Disciplinary Knowledge	• To know how to collect data on a common theme. • To know how to represent data using 2Count. • To know how to interpret data in a pictogram. • To know how to identify the totals and compare across categories. • To know how to create a suitable title for a pictogram and save their work.	• To know how to access Busy Beats on Purple Mash. • To know how to create their own music using the programme, with a focus on tempo and rhythm. • To know how to create a simple melodic pattern. • To know how to create a simple piece of electronic music.	
Term 3 A Unit 1	Unit 2.5 Effective Searching	Unit 3.7 Simulations	Crossover from previous term. Extension of knowledge into wider curriculum.
Substantive Knowledge	• To know the internet is a global network of connected computers around the world. • To know the world wide web refers to pages that can be seen in a browser, such as safari. • To know to find results we want within a search engine, we need to search effectively and precisely.	• To know computer simulations are programmes that model real life situations. • To know computer simulations can be realistic or unrealistic, depending on their design. • To know it is important to analyse and evaluate simulations. • To know simple simulations can be created using computer software.	Crossover from previous term. Extension of knowledge into wider curriculum.
Disciplinary Knowledge	• To know how to explain the difference between the WWW and the internet. • To know how to recognise a web browser. • To know how to recognise a search engine and its key features. • To use some search tools in a search engine (such as images), with guidance. • To know how to search using words.	• To know how to make a decision based on the options a simulation has given. • To know how to find solutions to problems encountered when exploring a simulation. • To know how to evaluate a simulation to determine its usefulness and purpose.	Crossover from previous term. Extension of knowledge into wider curriculum.

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		• To know how to plan and create a simple simulation using Purple Mash software.	
Term 3B Unit 1	Unit 1.7/2.7 Coding	BBC Micro bit introduction.	BBC Micro bit Challenges
Substantive Knowledge	• To know tasks can be given to people and computers using instructions, known as algorithms. • To know there are objects and action code blocks in the 2Code app that can be used to make a simple programme. • To know an event is something that makes a block of code run. • To know that debugging is when a code is fixed if it is not working in the way it was designed.	• To know the micro:bit is a tiny computer which needs instructions in code to make it work. • To know that sets of instructions for computers in a sequence are also called algorithms or programs. • To know the micro:bit has an LED display output which it can use to show words (as well as numbers and pictures). • To know that sequence and timing is important when making an animation. • To know that animations create an illusion of movement by showing a sequence of still images. • To know how sensor inputs from the accelerometer can be used to detect movement, such as when a step is taken. • To know that variables are used to keep track of the current step count. • To know how inputs, outputs, and computer code work together to make control systems. • To know how logic (conditional 'if… then… else' instructions) is used to make different outputs happen depending on changes in data from a sensor.	In successive years, children build their substantive knowledge about the practical ways the devices can be used. Challenges from the BBC Micro bit platform have been designed for different levels of challenge and application, and so as a school, each class teacher should chose projects based on the needs of their class, and differentiate these within a lesson for specific computing partners who need to be stretched or supported.

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Disciplinary Knowledge	• To know how to give clear instructions others can follow. • To know how to draw symbols that represent instructions. • To know how to recognise an object and an action in a printed code block. • To know how to make a command in 2Code by using an object and action together. • To recognise "when clicked", "before" and "after" within a code and the affect they have on the output. • To know how to delete lines of code that do not work or have been mis-used.	• To know how to connect the Micro:bit to a device such as an iPad or Laptop. • To know how to use the MakeCode editor to create instructions in code that the micro:bit can understand and then transfer them to the micro:bit. • To know how the micro:bit has an LED display output which it can use to show words (as well as numbers and pictures). • To know how to code the micro:bit to show simple animations on its LED display output. • To know how to use loops to make animations run longer using fewer instructions. • To know how to use 'forever' infinite loops to keep control systems responding to changes in the environment.	In successive years, children build their substantive knowledge about the practical ways the devices can be used. Challenges from the BBC Micro bit platform have been designed for different levels of challenge and application, and so as a school, each class teacher should chose projects based on the needs of their class, and differentiate these within a lesson for specific computing partners who need to be stretched or supported.