

St. Mary's and St. Benedict's RC Primary Curriculum Map -Computing



National Curriculum Key Stage 1

Pupils should be taught to:

- understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions,
- create and debug simple programs,
- use logical reasoning to predict the behaviour of simple programs,
- use technology purposefully to create,
- organise, store, manipulate and retrieve digital content,
- recognise common uses of information technology beyond school,
- use technology safely and respectfully, keeping personal information private;
- identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.

Declarative Knowledge sets out what children will know. This includes facts, concepts, definitions, and key ideas that form the foundation of the unit.

Procedural Knowledge sets out what children will be able to do. This focuses on the skills and processes children should develop and apply when using technology.

Cycle A

KS1

Aut 1 Self-image and identity Online relationships	Aut 2 Online Reputation Online Bullying	Spr 1 Health, Wellbeing and Lifestyle
Creative computing NC links: Use technology purposefully to create, organise, store, manipulate and retrieve digital content.	Data Explorers NC links: Use technology purposefully to create, organise, store, manipulate and retrieve digital content.	Creating and following instructions NC links: Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.
Declarative Knowledge ○ Art can be created using digital tools. ○ Digital tools can be used to play and make simple games. ○ Purple Mash allows a user to share work for others to use on digital display boards.	Declarative Knowledge ○ Items can be grouped using a range of criteria, and a logical process should be used when doing so. ○ Digital tools can be used to group images of items. ○ Sorting is a way to organise items. ○ Sorting and grouping have different meanings. ○ Data is information that can be collected and used. ○ Data can be represented digitally using pictures. ○ Before collecting data, you must think about how it can be ○ Before collecting data, consider how it will be used and what information you need to collect.	Declarative Knowledge To achieve a specific effect when building something, accurate instructions must be followed. Computer programs need precise instructions to follow, and these are called algorithms. • If instructions are vague, outcomes will vary for a given task. The order of instructions for a task affects the results. Correcting errors in an algorithm or program is called debugging.

Procedural Knowledge ○ Select colours and painting effects in 2Paint. ○ Control a computer mouse. ○ Use a mouse or finger (device dependent) to perform tasks. ○ Use drag and drop methods to complete games, including 2DIY jigsaws and placing activities. ○ Use the image gallery to create jigsaw images. ○ Use hotspots in 2DIY placing games. ○ Share work to a Purple Mash Display Board. ○ Access shared work on a Purple Mash Display Board.	Procedural Knowledge ○ Identify criteria that can be used to sort items into groups. Sort items using criteria. Logically sort items into groups. ○ Identify criteria that can be used to sort items into groups. ○ Sort items logically using chosen criteria (including using digital tools to group images). Complete grouping questions in 2Question. ○ Decide whether it is better to sort or group items to organise them. ○ Identify items to be grouped or sorted as examples of data and use grouping/sorting to answer questions. ○ Create a pictogram in 2Count using class data, and answer questions using the pictogram. ○ Collect and record data. Input the data into the 2Count tool. Make a pictogram using 2Count. Answer questions using the pictogram.	Procedural Knowledge ○ Think carefully about how to word oral instructions to achieve a desired outcome. Give clear, precise and concise instructions for someone to follow. Test whether instructions have been followed by comparing the outcome to the instructions. Examine instructions to see where confusion might have arisen. ○ Use a computing device to follow simple instructions in a painting project. Examine the outcomes of following instructions to check for differences in interpretation. Decide whether any differences were due to the clarity of the instructions or the end user. ○ Find errors in a simple algorithm. Correct an algorithm sequence by re-ordering it. Recognise when an algorithm has been debugged. Apply learning about debugging an algorithm to other incorrectly sequenced instructions, such as baking cakes.
<u>Key Vocab</u> Digital art, drag and drop, Arrow keys, touch screen gestures, hotspot,	<u>Key Vocab</u> Group criteria, data, sort, pictogram	<u>Key Vocab</u> Instructions, algorithm, program, coding, computer bug, debugging,
Spr 2 Privacy and Security	Sum 1 Managing Online Information	Sum 2 Copyright and Ownership
Animated stories NC links: Use technology purposefully to create, organise, store, manipulate and retrieve digital content.	Coding NC links: Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. Create and debug simple programs. Use logical reasoning to predict the behaviour of simple programs.	Technology around us NC links: Recognise common uses of information technology beyond school. Use technology safely and respectfully.
Declarative Knowledge ○ There are differences between traditional books and digital books. ○ Images can be created within digital book software. ○ Digital books can have animations. ○ Copying and pasting is a term used in computing when things are copied from one place to another. ○ Audio such as sound effects, voice recordings and music can be included within digital books. ○ Backgrounds are static images in contrast to the animated foreground.	Declarative Knowledge ○ Computer programs work by following instructions called algorithms. These are written as computer code that the computer can interpret. ○ In 2Code, code is created using coloured code blocks. ○ Code view is the place in 2Code where you see and use the blocks of code. ○ Each single instruction such as 'Object Right' is called a command. ○ To make an algorithm happen, you must execute, or run, the code. ○ An event is something that makes a block of code run in	Declarative Knowledge ○ Technology is something that uses scientific knowledge to solve problems or invent useful tools. ○ Technology is used within many environments. ○ Not all technology is digital technology. Digital Technology subset of technology for sharing information. ○ The word hardware is used to describe the physical parts of a digital technology device. ○ It is important to use technology safely and that there are some risks associated with the use of technology.

○ The style of digital text is called the font. This can be changed after typing the text.	○ response to an action such as a user pressing a key or clicking a screen. ○ Debugging is the name for fixing code that isn't working how it was designed to work. ○ The look of a program in 2Code is created in the Design View using backgrounds and objects. ○ Program design is the first stage to making a well thought out program	
Procedural Knowledge ○ Identify differences and similarities between traditional books and digital books. ○ Use the painting tools within 2Create a Story. Use picture editing tools such as 'undo' and the 'eraser' to improve created images ○ Apply animation effects to images in 2Create a Story. Choose effects that make characters appear to interact. ○ Copy and paste in 2Create a Story. Organise and copy pages in a digital book. ○ Record sound for 2Create a Story pages. Insert sound effects and music into a 2Create a Story book. ○ Add backgrounds to 2Create a Story pages. Change the font and size of typed text	Procedural Knowledge ○ Create instructions in the form of simple algorithms with attention to the order and the level of detail. Interpret what a piece of code means. ○ Recognise object code blocks in 2Code are light blue. Recognise action code blocks in 2Code are dark blue. Recognise event code blocks in 2Code are green. Recognise output code blocks in 2Code are purple. ○ Switch to code view. Code blocks are dragged into the coding area to create commands. ○ Understand how code blocks fit together to create a command. Make a simple command in 2Code by using an object and action together. ○ Execute the code to see the effect by clicking Run. ○ Use the 'When Clicked' event code block. Position a command inside a 'When Clicked' event code block. Give an object an action that occurs when it is clicked. Test 'When Clicked' events. ○ Begin to use logical reasoning to find where bugs in the code are. Fix bugs in code. ○ Switch to design view. Choose background images. Add objects and modify some attributes such as scale. ○ Plan what objects in a scene will do. Debug the program against the design specifications. Recognise that this is the algorithm for the program. Use own design to code a program.	Procedural Knowledge ○ Recognise examples of technology. Describe the purpose of common types of technology. ○ Identify technology within school, at home and in the wider world. Explain how this technology is helpful. ○ Give examples of digital technology and contrast this with technology. ○ Name examples of technology hardware including peripheral devices. ○ Use devices safely. Point out the risks of situations involving technology.

<u>Key Vocab</u> Digital book, eraser, undo, animation background, copy and paste, Font, text, sound effect	<u>Key Vocab</u> "Instruction, Algorithm (r), Program, Programmer, Code, Coding Code blocks", "Object, Action, Debugging, Design view Code view, "Event, When clicked, Command", Output, "Attribute Scale, Program design	<u>Key Vocab</u> "Technology Device Electronic" Digital technology Hardware
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Cycle B

KS1

To Be Safe units

Autumn 1 Self-image and identity Online relationships	Autumn 2 Online Reputation Online Bullying	Spring 1 Health, Wellbeing and Lifestyle
Route Explorers/ The Internet NC Link: Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. Create and debug simple programs. Use logical reasoning to predict the behaviour of simple programs. Use technology purposefully to create, organise, store, manipulate and retrieve digital content. Recognise common uses of information technology beyond school.	Creating Pictures NC Link: Use technology purposefully to create, organise, store, manipulate and retrieve digital content.	Spreadsheets NC Link: Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. Create and debug simple programs. Use logical reasoning to predict the behaviour of simple programs.
Declarative Knowledge - The combination of a direction and a distance is known as a command in 2Go. - Commands can be input into 2Go to control the movement of a screen turtle in four directions. - Planning a route is important in order to input the correct commands. - Routes can be programmed to perform more than one command in a sequence. - A list of instructions for a route is the algorithm. - Errors (bugs) occur because commands may have been input incorrectly. Fixing the errors is called debugging. - The Internet is a global network of connected computers around the world.	Declarative Knowledge - Digital art tools usually have a choice of painting effects. Painting effects can be combined to help a user make pictures of various styles. - The size of an onscreen painting tool brush stroke can be manipulated. - Intensity of colours can be manipulated digitally. - Outline features in a digital art program can help a user compose an image.	Declarative Knowledge - A spreadsheet is a program that organises data in rows and columns. 2Calculate is a type of spreadsheet program. Each box in a spreadsheet is called a cell, and every cell has a unique name. Rows run horizontally, and columns run vertically. - Formatting tools can be used to change the way data looks (e.g. size, colour, wrap text). It is important to consider clarity of a spreadsheet and what can be done to improve this. - Images and numbers can be used in spreadsheets, and values can be assigned to images. - Spreadsheets can use a range of mathematical operations to carry out calculations automatically.

○ An internet connection allows people to communicate with others over the internet and that this is commonly known as being online. An internet connection can be made using wires wirelessly. ○ A browser is used to access websites and webpages of the World Wide Web. ○ The World Wide Web refers to the documents and pages someone sees when using a browser. ○ Smart devices are those that can connect to the internet to do more than a basic function. ○ The 'front page' of a website is known as the home page. ○ Webpages have links that, when clicked, display other webpages. ○ Websites can be found using a browser that contains a search engine.		○ 2Calculate contains various tools that can be used for different reasons. The 'Is Equals' tool can check if a calculation is correct. The 'Quiz' tool can be used to make interactive questions inside a spreadsheet. The 'Count' tool can show how many of something there are in a spreadsheet. ○ Block diagrams are a way of presenting data to make it easier to understand. Two sets of data are needed to create a block diagram (one for the category, one for the amount).
Procedural Knowledge ○ Input commands in 2Go. ○ Input purposeful commands in 2Go to move the turtle in a specific direction towards a goal. ○ Use techniques such as finger movements to plan route. ○ Input several commands into a sequential algorithm layout and run this code to move the turtle along a programmed route. Reset the turtle to the starting position to re-run the code. ○ Plan the route by writing the algorithm first and then inputting the commands. ○ Make logical attempts to debug code for routes. Reset, debug and re-run the code to test routes. ○ Explain the difference between the Internet and the World Wide Web, recognising that they describe different things. ○ Explain that Wi-Fi describes a wireless internet connection. ○ Recognise a web browser. ○ Find information on a school's website by viewing different webpages. ○ Decide whether a device is a smart device. • Give examples of smart devices. ○ Navigate to the Purple Mash homepage and to a school's website homepage.	Procedural Knowledge ○ Explore the range of painting effects in 2Paint. ○ Produce digital images in traditional art styles using digital painting effects. ○ Observe how the painting effects give different results. ○ Use the brush tool slider to change the size of brush strokes to achieve the desired effects. ○ Use the dilute tool to manipulate the intensity of any selected colour. ○ Make use of outline features, such as selecting, resizing, and editing outlines, to enhance their digital art.	Procedural Knowledge ○ Identify a cell by its name. ○ Enter data into a cell and move between cells with ease. ○ Explain the difference between a row and column. ○ Resize rows and columns to make data clearer. ○ Use formatting tools such as colour, wrap text, and alignment to improve clarity and organisation of data. ○ Check and improve their spreadsheet to ensure it is neat, accurate, and easy to understand. ○ Insert images and assign them numerical values. ○ Apply calculation tools (add, subtract, multiply, divide) to carry out operations in a spreadsheet. ○ Use the 'Is Equals' tool to check whether a calculation is correct. • ○ Use the 'Quiz' tool to create an interactive calculation. ○ Use the 'Count' tool to total how many of an item appear in the spreadsheet. ○ Create block diagrams in 2Calculate to present data visually.

Use a link on a webpage of a school's website. Use keywords to search for information using a search engine.		
<u>Key Vocab</u> "Direction, Command, Instructions", Route, "Algorithm Coding", "Computer bug, Debugging", "Internet World Wide Web , Browser", "Modem, Router, Wi-Fi Smart Device", "Website Webpage, Home Page, Link", "Search Engine, Search Bar, Keywords"	<u>Key Vocab</u> "Impressionism*", Palette, Style*", "Pointillism*", Outline*", "De Stijl*", Fill Tool, Horizontal*, Vertical*", "Arts & Crafts*", Repeating Pattern*, Rotated Pattern*, Symmetry*", "Digital Portfolio, Import, Image Picker, Resize"	<u>Key Vocab</u> "Spreadsheet, Cell, Row, Column, Click & Drag", "Resize Format, Edit, Delete, Wrap text", "Automatically Apparatus, Value", "Controls Toolbar, Count Tool Is Equals Tool, Quiz Tool", "Block Diagram Axis/Axes, Data, Title, Labels"
Spring 2 Privacy and Security	Summer 1 Managing Online Information	Summer 2 Copyright and Ownership
Questioning NC Links Use technology purposefully to create, organise, store, manipulate and retrieve digital content.	Coding NC link Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. Create and debug simple programs. Use logical reasoning to predict the behaviour of simple programs.	Making Music NC Link Use technology purposefully to create, organise, store, manipulate and retrieve digital content.
Declarative Knowledge - Data is information that can be collected, recorded, and presented in different ways. - A tally chart is a method of counting and recording data - Pictograms and bar charts are ways of presenting data visually. - Closed questions can limit responses, while open questions allow more detailed answers. - Yes/No questions can be use to help sort and classify information. - A branching database uses Yes/No questions to organise and identify information.	Declarative Knowledge - In computing, a set of instructions is known as an algorithm. Steps in an algorithm must be followed to achieve the intended outcome. - The collision detection event is a way to cause an action when two objects collide with each other. - Programs follow a sequence of instructions (commands) in order. - Timer commands can be used to make parts of the program run after a set time. - Different object types in 2Code have different attributes that can be changed. - Event commands in 2Code are used to create block code that are run when an event happens. There are different event command blocks in 2Code. - Debugging is the process of testing that a program works as intended, looking for any bugs and fixing the problems when found.	Declarative Knowledge - Live, instrumental music is created by real instruments, and digital music is created by using a computer. - Music can be made digitally using programs like 2Sequence. - Sounds can be incorporated into music programs to make a tune. - Notes that are the same colour on 2Sequence represent the same note tone. - The speed of a digital musical, known as tempo, can be altered by changing the BPM (beats per minute). - The volume of instruments/sounds on a track can be changed when using music programs. - Looping a track means that it continues to play on repeat. - Music programs let users incorporate their own sounds into a composition

Procedural Knowledge ○ Collect simple data by asking questions and recording answers. ○ Use tally charts to organise collected data.	Procedural Knowledge ○ Follow a written algorithm. Identify required events, objects and actions from a program algorithm. ○ Identify the collision detection block within the event category blocks. Use a collision detection block in a program. Assign two objects within the collision detection command. Assign an event for when the two objects collide. ○ Run code and see the sequential effect that occurs. ○ Identify the timer command within the control category blocks. Use the time after command and set a specified number of seconds. Nest actions within the timer command to delay their running. ○ Use a variety of object types. Identify attributes which appear under some objects and not in others e.g. a turtle type and a character type. Alter attributes of an object, such as the image and scale within Design View. ○ Recognise the event command blocks – When Key Event, When Swiped Event, When Clicked Event and Collision Detection. Use a variety of event blocks in different circumstances. Use specific event commands specific objects, such as a click event for a button object. ○ Use logical reasoning to identify the source of bugs and attempt to fix them. Test and debug code in a systematic way.	Procedural Knowledge ○ Identify if sounds are made by real instruments or made by a computer. Identify the sound of different instruments, whether live or digitally made. ○ Open 2Sequence. Listen to a premade composition by pressing the play button. Observe what happens on the screen when composition is playing including the placement of sounds. ○ Explore the sounds and instruments category. Drag sounds into the playable area. Play and experiment with the organisation of sounds on each track. ○ Compare the sounds of different notes. Recognise that some notes sound the same. Recognise that some notes sound better together than others. Compare the sounds of different notes. Recognise that some notes sound the same. Recognise that some notes sound better together than others. Compare the sounds of different notes. Recognise that some notes sound the same. Recognise that some notes sound better together than others. ○ Locate the beats per minute slider. Experiment with changing the slider's position. Listen in play mode to how changing the position of the slider affects a composition. ○ Locate the different rows of music. Locate the volume sliders at the end of each row of music (tracks). Adjust the volume on individual rows of music (tracks). Play the music and test the effect of altering the volume individual tracks. ○ Experiment with the looping feature. Identify how this affects a tune. Manipulate a piece of music so that it sounds correct when looping and doesn't have a noticeable jump when it restarts each repeat. ○ Locate the My Sounds section. Click on the record icon. Use the record button to incorporate own sound from a microphone. Test the recording back by pressing play. Click done when happy with recording.
<u>Key Vocabulary</u> Data, Primary data, Pictogram, Tally chart, Open question	<u>Key Vocabulary</u> Algorithm Event	<u>Key Vocabulary</u> Digital Music, Tune, Compose, BPM, Volume Sound Effect (SFX), Looping", Background Music

Closed question, Yes or no question, Grouping, Sorting, Branching database	Object, Action, Debug/debugging, Program design Program, Collision detection, Command, Sequence, Timer Attribute, When swiped event, When key event When clicked, Output, Button object", Bug	
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KS2 Pupils should be taught:

- design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
- understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration
- use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
- select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

Cycle A

LKS 2

Autumn 1 Self-image and identity Online relationships	Autumn 2 Online Reputation Online Bullying	Spring 1 Health, Wellbeing and Lifestyle
Email NC Links Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. Understand computer networks, including the Internet; how they can provide multiple services,	Route Planners NC Links Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.	Spreadsheets NC Links Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.

such as the World Wide Web; and the opportunities they offer for communication and collaboration.	Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.	
Declarative Knowledge - There are different methods of communication, and they each have strengths and weaknesses. - Emails are a form of digital communication. - Emails can be sent and received almost instantly to anyone with an email address. - Common features of email software are the inbox, the 'To' address field, the sender email address, the subject, the message text, and the compose and reply functions. - Alerts can be used to notify a person that they have unread email. - Address books can be saved in the email software. This provides a convenient way to send emails without typing the full email address each time. - Pictures, documents and other file types can be attached to emails. - There are risks related to use of email.	Declarative Knowledge - The combination of a direction and a distance is known as a command in 2Go. - Commands can be input into 2Go to control the movement of a screen turtle in four directions. - The turtle can be set to rotate by angles of 90° or 45° both clockwise and anticlockwise. - Planning a route is important to ensure the correct commands are input. - A list of instructions for a route is called an algorithm. - Routes can be programmed to perform more than one command in a sequence. - Routes can be programmed to repeat a sequence of commands a set number of times. - Errors (bugs) occur because commands may have been input incorrectly. - Fixing the errors is called debugging.	Declarative Knowledge - A spreadsheet is a digital tool used to organise and analyse data. - A sheet is one page within a spreadsheet file and that several sheets can exist in one file. - Cells are the individual boxes where data is entered, arranged in rows and columns. - Advanced Mode provides more tools and features than simple mode. - Copy and total tools allow data to be copied or totalled automatically across rows, columns, and diagonals. - A formula is a set of instructions that tells a spreadsheet what to calculate, starting with an equals sign (=). - The Formula Wizard helps users build formulae without typing them manually. - A function is a built-in formula (e.g. SUM, AVERAGE, MIN, MAX) that performs specific calculations automatically. - A range is a group of selected cells used together in a formula or function. - Formatting tools, such as merge cells, can improve how data looks. - Spreadsheets can be used to solve real-life problems such as comparing values or analysing costs. - Problem solving with data involves choosing the most efficient tool or function for the task.
Procedural Knowledge Explain the advantages and disadvantages of different communication methods.	Procedural Knowledge Input commands in 2Go.	Procedural Knowledge Create and open a spreadsheet to record and organise data effectively. • Add,

○ Choose an appropriate communication method for a task. ○ Make use of 2Email to communicate within school. ○ Recognise the differences between digital and non-digital communication methods. ○ Explain different digital communication methods such as instant messaging, email and video calls. ○ Identify the advantages of instant communication. ○ Explain the differences between email and traditional communication methods which are not instant. ○ Identify the common features of the email screen. ○ Make use of these common features of email software to communicate digitally. ○ Use the address book within 2Email to find contacts. ○ Send emails to multiple contacts using the address book. ○ Identify the attachment icon. ○ Select files to attach to an email and send. ○ Be cautious of emails that have attachments. ○ Discuss the advantages and disadvantages of being able to send attachments with emails. ○ Recognise a concerning email/contact. ○ Identify who a trusted contact is. ○ Report any concern to a trusted adult and use the report to teacher feature in 2Email. ○ Consider consent when sharing content digitally.	○ Input purposeful commands in 2Go to make the turtle move in a particular direction towards a goal. ○ Input commands that rotate the turtle to face the desired direction for movement using both 90° and 45° angles. ○ Use techniques such as finger movements to plan a route. ○ Plan the route by first writing the algorithm and then inputting the code commands. ○ Input several commands into a sequential algorithm layout and run this code to move the turtle along the programmed route. ○ Reset the turtle to the starting position to re-run the code. ○ Use the repeat algorithm layout for 2Go commands. Anticipate the ○ effect of the repeat and use logical reasoning to decide upon when this layout is useful to accomplish a task. ○ Make logical attempts to debug code for routes. ○ Reset, debug and re-run the code to test routes.	○ rename, and organise multiple sheets within a single spreadsheet. ○ Enter, edit, and delete data accurately within cells. ○ Explore and use features available in Advanced Mode of 2Calculate to enhance spreadsheets. ○ Use the copy and total tools to duplicate or total data efficiently in different directions. ○ Enter simple formulae manually or with the Formula Wizard to calculate values. ○ Open and use the Formula Wizard in simple or advanced mode to select operations or functions. ○ Apply built-in functions such as SUM, AVERAGE, MIN, and MAX to sets of data. ○ Select a range of cells when applying formulae or functions. ○ Merge cells to create headings or improve layout and presentation. ○ Use spreadsheet tools to solve real-world problems and explain how solutions were reached. ○ Select and apply appropriate formulae, functions, or tools to answer a given question or scenario.
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Recognise personal and private information and know what is not appropriate to share with a recipient.		
<u>Key Vocab</u> "Communication", "Email, Inbox", "Compose, Address book Recipient", Attachment, "Trusted contact, Personal information, Password", Email simulation	<u>Key Vocab</u> "Command, Route, Algorithm, Turtle object" "Rotation, Angle, Degrees", Debug/Debugging, Repeat	<u>Key Vocab</u> "Advanced Mode, Sheet, Merge Cells", Copy Tools, Total Tools", "Formula, Formula Bar, Formula Wizard", "Function SUM, AVERAGE, MIN, MAX , Range", Operations Problem Solving, Data"
Spring 2 Privacy and Security	Summer 1 Managing Online Information	Summer 2 Copyright and Ownership
Coding NC Link Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.	Presentations NC Link Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.	Micro:bit NC Link Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.
Declarative Knowledge - Flowcharts are a type of diagram that use specifically shaped labelled boxes and arrows to represent an algorithm as a diagram. - Timers can control when a block of commands run. • Timer commands can be run after a timed delay or at regular intervals. • In 2Code there are two timer options, timer every or timer after. These can be altered by changing the number of seconds/quarter seconds.	Declarative Knowledge - You can use Presentation software to create and display information to an audience that is clear and engaging. - There is a range of different presentation software available such as Microsoft PowerPoint, Google Slides and Apple Keynote which share similar layout features. - Simple presentations can be made quickly by using features such as textboxes, word art and images. - Designs of slides can be changed.	Declarative Knowledge - A micro:bit is a tiny computer which needs instructions in code to make it work. - A micro:bit can produce outputs. - A micro:bit can receive inputs. - Code from the coding environment can be transferred onto a micro:bit. - The order (sequence) of instructions is important when coding.

○ Repeat is a control block allowing blocks of commands to repeat a specified number of times. ○ Testing and debugging are an important part of the process of making computer programs. • Understanding what nesting is and the effect it has on a program can help when trying to debug a program.	○ Animations can be applied to images and text to make a presentation more eye-catching. ○ Transitions can be to change the way a slide moves onto the next, in an eye catching way. ○ Slide notes can be added to provide the presenter with prompts of what to say when presenting each slide. ○	
Procedural Knowledge ○ Identify features of a flowchart including the starts, inputs, outputs, delays such as a timer, actions and events. • Follow the flow of the chart and interpret what it is representing. • Use a flowchart as part of a planning process for designing a program. ○ Code the features of timer after command including the interval, action(s), correct nesting of commands. • Distinguish between the use of the timer every and timer after commands. • Use a timer every command to make an event happen repeatedly. ○ Identify situations when a repeat command can make the code more efficient. • Use a repeat command to make other commands repeat. ○ Read the code of example programs with nesting to determine the outcome of running the code. • Test what happens when changing how a program is nested. Examples could include moving a timer so that it is nested within a timer that is currently nested within a when clicked command and comparing how it executes. •	Procedural Knowledge ○ Explain what presentation software is used for. ○ Locate and open appropriate presentation software. • Identify some of the basic layout features of the software. ○ Locate and click on a blank presentation. • Delete existing text boxes on a blank slide. • Insert new text boxes manipulating size and position. • Insert word art into a presentation slide. • Insert images into a presentation slide. • Resize and manipulate images appropriately on a slide. ○ Identify the design area from the menu ribbon. • Explore the different design templates available. • Preview designs and apply one of choice to a presentation. ○ Select an image on a slide. • Identify the animation area from the menu ribbon. • Apply an animation to an image. ○ Select a slide that a transition is to be applied to. • Identify transitions from the menu ribbon. • Select and apply a suitable transition.	Procedural Knowledge ○ Explain that a micro:bit is a piece of hardware that can have code created for it that makes use of its inputs and outputs. • Recognise and locate key hardware components on the micro:bit such as its display, speaker and accelerometer. ○ Identify and use code blocks that produce outputs. • Use display text, show LEDs and play music outputs in program to meet specific intentions. • Code a micro:bit to make different outputs happen depending on different inputs. ○ Identify and use code blocks that are associated with receiving inputs. • Use event commands such as ‘when micro:bit button’ and ‘when gesture’ in programs to meet specific intentions. • Make a program that requires inputs (event commands as above) that produce an output. ○ Use the simulator within the Freecode micro:bit environment to test code before transferring to micro:bit. • Use the transfer feature to move code to a micro:bit. ○ Recognise how the order of code is essential in order to meet a program’s

Use the knowledge of nesting to help debug a program that isn't working as intended. ○ When presenting to an audience, it is important to speak clearly, make good eye contact, use notes to explain things clearly and take your time.	○ Locate the slide notes box. • Type notes that are useful to prompt the presenter with what to say when presenting. ○ Consider the features of an effective presentation when creating one. • Use all taught skills to produce an effective and informative presentation. ○ Rehearse their slideshows before presenting in front of others. • Follow the instructions to present effectively.	intentions. • Use sleep command within a sequence of code to temporarily pause a program e.g. when creating an animation effect using LEDs. ○ Use the repeat forever command within a sequence of code to produce an infinite looping sequencing such as a beating heart animation.
<u>Key Vocab</u> Collision detection, flow chart, procedure, timer, sequence, nested, interval, repeat, button object, turtle object, right angle, degrees, object, action, event, nesting, test, debug, design, algorithm, object, output, attribute, alert	<u>Key Vocab</u> PowerPoint, slides, keynote, format, font, word art, media, image, handles, picture styles, shape styles, animation, transition, speaker, presenter notes,	<u>Key Vocab</u> Hardware, LED, repeat, programme, software, animation, image, infinite loop, output, sequence, data, input, selection, accelerometer, gestures, sound output, speaker
<u>LKS2</u> <u>Cycle B</u>		
Autumn 1 Self-image and identity Online relationships	Autumn 2 Online Reputation Online Bullying	Spring 1 Health, Wellbeing and Lifestyle
Animation NC Link Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.	Unpacking Hardware and Software/ NC Link Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information. Sound Stories Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals,	Logo NC Links Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.

	including collecting, analysing, evaluating and presenting data and information.	
Declarative Knowledge ○ Some animations are created by hand and others with the help of technology. ○ Animation software has specific functions that support the animation of still images such as static backgrounds, onion skinning and copying frames. ○ Choices of sound effects, their timing and frames per second settings can enhance an animation ○ Storyboarding is a process that supports planning an animation.	Declarative Knowledge ○ The word ‘technology’ describes using scientific knowledge to design and make tools, systems or machines that help solve problems or make tasks easier. ○ Electrical, digital and smart technology are sub-sets of technology. ○ Hardware describes the physical parts of a computer. ○ Software describes the programs that instruct a computer to complete computational tasks. ○ Software and hardware operate together to follow processes that assist in completing tasks. ○ An audiobook is a story or book read aloud and recorded for people to listen to. ○ As well as being an enjoyable way to access a story, audiobooks make texts more accessible for a range of people. ○ Audiobooks can be made more interesting by adding expression, different voices, sound effects and background music. ○ An audiobook script may contain notes on the speaker, the text spoken and how the sound effects are created and used. ○ There are specific roles within the group when creating an audiobook with recording software. ○ Exciting audiobook narration will contain clear pronunciation, a range of tone and pitch to show emotion, and pauses to create dramatic effect.	Declarative Knowledge ○ Logo is a text-based coding language in which commands are written to control the movement a screen turtle. ○ Commands in Logo consist of directional or rotational commands that include a direction and a distance in spaces or degrees, and operational commands that alter how the output looks or how the code runs. ○ Spacing of commands in Logo is important. ○ Visual effects can be achieved by using the PU, PD, SETPC and SETPS commands. ○ Logo commands can be repeated a set number of times using the repeat command. ○ A procedure is a named set of Logo commands that will be run in the program when referred to by name. ○ Errors (bugs) occur because commands have been input incorrectly. • Fixing the errors is called debugging.

	○ Editing is the process of polishing and improving an audiobook to ensure it is the best it can be. ○ Reviewing and evaluating is an important step when creating any digital content including audiobooks.	
Procedural Knowledge ○ Describe how hand drawn animation is created. • Make a simple flick animation book. • Contrast the process of animating by hand to the use of animation technology. ○ Use 2Animate to make simple animations using the specific animation functionality. ○ Choose appropriate sound effects and speeds for animations. ○ Use storyboarding to plan an animation.	Procedural Knowledge ○ Identify whether an item is an example of technology. ○ Decide whether an item is an example of electrical, digital or smart technology. ○ Define what is meant by hardware, components and peripherals. • Name hardware components of a computer system. • Describe the function of these different parts. ○ Identify the functions and common components of different software tools and relate them to the tasks those tools perform. ○ Describe a process in terms of inputs, hardware and software processing and outputs. ○ Explain the differences between an audiobook and a physical book. ○ Explain the advantages and disadvantages of an audiobook over a physical book. • Recognise the features that makes an audiobook engaging. ○ Identify where a voice or sound effect might make a recorded story more exciting and engaging. • Create a range of sound effects using everyday items. • Use the library of music and sound effects on 2Cast.	Procedural Knowledge ○ Input commands in the Logo tool to make the turtle move in a particular direction towards a goal. ○ Input directional commands (FD, BK, RT, LT) and more abstract, non-directional commands (such as PU and PD). ○ Space commands correctly and debug with a consideration for spacing when errors occur. ○ Alter line properties to explore visual effects. • Use the line commands to achieve desired visual effects from the code. ○ Identify where the repeat command would be efficient to use. • Create regular shapes using the repeat command. • Anticipate the effect of the repeat when used in example code. ○ Write and save Logo procedures. • Call the procedures within their code. • Consider how best to use procedures to make their code efficient. ○ Make logical attempts to debug Logo code. ○ Make use of multi-line mode for more complex code to enable easier debugging. ○

	○ Read and understand cues on an audiobook script. • Contribute to writing a successful script for an audiobook. ○ Explain the roles of a narrator, a sound technician, an editor and a sound effects manager. • Take a role within the team and contribute to the recording and editing of an audiobook extract. ○ Experiment with a variety of voice tones and effects within the narration of audiobooks, refining the overall effect. ○ Use the editing tools within 2Cast, including cutting, copy and paste, duplication and moving segments on the timeline. ○ Reflect on their work and think about any improvements which could be made using the criteria from the lesson. ○	
<u>Key Vocab</u> Animation, animation software, frame, stop motion, onion skinnin, copy frame, frames per second, background, sound effect, storyboard, copy frame, sound effect, evaluate, sharing controls	<u>Key Vocab</u> Technology, manual technology, electrical technology, digital technology, smart technology, computer system, hardware, peripheral, component, input, output, storage software application (app), programme, process	<u>Key Vocab</u> "Logo , Logo Commands", Pen Up, Pen Down Multi-Line Mode", Repeat, Setps, Setpc", Procedure
Spring 2 Privacy and Security	Summer 1 Managing Online Information	Summer 2 Copyright and Ownership
Effective Searching NC Link Understand computer networks including the interne how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration • Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content • Use technology safely, respectfully a responsibly; recognise acceptable/unacceptable	Coding NC Link Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.	Introduction to AI/ NC Link Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information. Microbit (LO 1&2) Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. • Use

behaviour; identify a range of ways to report concerns about content and contact.		sequence, selection, and repetition in programs; work with variables and various forms of input and output. • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.
Declarative Knowledge ○ A search engine bases its ranking on the relevance of the information, the popularity of the website the information is from and whether the business has paid for the information to rank higher. This means the higher ranked results are not always the best. ○ There are a range of techniques you can use to refine a search query, including using quotes, using the minus sign and using filters. ○ Information can be put online by anyone so we should not take everything we read as fact. ○ A fact is something that is true and provable, an opinion is something that someone feels and a belief is something that someone accepts to be true based on their faith or tradition. ○ Fake news is information that might look real but isn't. Sometimes people make fake news for fun, to make money or try and change the way people think. It is important to evaluate the reliability of any information that we find online.	Declarative Knowledge ○ There are object types in 2Code; these have different attributes (properties) that can be changed in code and design view. ○ Selection in a program means that it has a decision command that will run different procedures dependent on whether a condition is met or not. ○ Co-ordinates are used in computer programming to determine the position of a point, shape or object and that these change according to where they are positioned on the screen. ○ 'If' statements and 'if/else' statements are used to create selection in 2Code. ○ Programs use different commands including repeat, repeat until and timers to make code loop in a program. ○ Variables are a place in computer memory that remains for the length of the program. • Variables have a name and a value. • The values can be changed in the code. • Variables are used in programming to keep track of things.	Declarative Knowledge ○ Artificial Intelligence is a type of technology that can make predictions, take actions, and create content, by learning from data. ○ In order to communicate effectively with AI, it is important to write clear and precise prompts. ○ There are specific behaviours that a user of AI should practise and use to become a good AI digital citizen. ○ AI will continue to evolve. ○ Sensor inputs can be used to detect changes in the environment. ○ Variables are used to keep track of changes in a program and can be used to help with decisions a computer can make. ○ Inputs, outputs and computer code work together to make control systems.

Procedural Knowledge ○ Recognise and find a search engine on the internet. ○ Explain the uses of a search engine. • Recognise and name some popular search engines. ○ Explain the different stages of how a search engine works to find relevant information. ○ Select appropriate key words to use in a search to answer a particular question. • Perform a keyword search when looking for information online. ○ Explain how information on webpages is gathered, copied and stored by a search engine's program known as web crawlers or spiders. ○ Explain that when a search is made, a search engine searches through its index rather than through the pages of the internet. ○ Explain how search results are selected and ranked. • Look through search results and evaluate which could be the most useful. ○ Use techniques such as quotes, the minus sign and filters to refine a search query. ○ Explain the importance of questioning where information online has actually come from. ○ Explain the differences and identify examples of facts, options and beliefs. ○ Identify the difference between real news and 'fake news'. Understand the reasons why someone might want to put fake news online. ○ Check whether information online is reliable and true by checking if it sounds real, checking the source, checking the date and checking if the news is also reported by other sources.	Procedural Knowledge ○ Change object attributes in design view. • Choose object type with an understanding of the possible object attributes and actions. ○ Interpret flowcharts depicting selection and explain what happens if a condition is or isn't met within it. ○ Identify co-ordinates in Design view. • Change the co-ordinates of objects within the code. ○ Identify 'if' and 'if/else' control blocks. • Read code that includes selection to determine what the program will do. • Create selection within 2Code using 'if' and 'if/else' statement blocks. • Debug programs that use selection. • Nest an if/else block inside an if/else block to give a user different validation options. ○ Use the 'Repeat' command to make a looping program. • Use the 'Repeat Until' command to make a looping program. • Make decisions about whether to use repeat or timers depending upon the program requirements. ○ Create number variables and initialise their values. • Change the value of variables within the program by using the 'Change Variable' command. ○ • Use the value of variables within programs. ○ • Use the variable watch to monitor how a variable changes as the program executes code	Procedural Knowledge ○ Explain what AI is and provide some practical example uses of it. • Explain that AI learns from data and therefore more accurate data will lead to better quality outputs. • Explain what generative AI is. • Describe the different actions AI can perform with examples for: Finder, Personaliser, Assistant, Organiser and Maker. ○ Highlight key parts of an effective prompt. • Write an effective prompt. • Refine the prompt for clarity. • Test prompts using AI technology such as Goggles AI. ○ Identify common characteristics of a good citizen and compare these to the digital world. • Follow four rules that make good digital citizens when using AI. • Identify which digital citizen rules are being broken in AI based scenarios. ○ Explain the ways AI may help in the future with regards to education, transport, travel and the environment. • Explain the importance of human oversight when designing AI tools. • Design an AI tool of the future. ○ Explain what the accelerometer is and how it can check for changes in movement. • Explain what the light sensor is and how this can be used to detect light level changes. • Write code that uses light sensors and/or accelerometer inputs. ○ Explain that variables hold a value. • Create a number variable in a program. • Change a number variable in a program when an event happens such as an input being received. • Combine the use of a variable value with If statements to make different outputs happen when a value of a variable matches the value set in an If statement.
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		○ Explain that inputs, outputs and computer code can work together to make simple systems such as a light level detector by using a micro:bit. • Identify the control blocks of code: repeat, if and else. • Identify input code blocks. • Identify output code blocks. • Create a simple piece of code that makes up a control system. ○ Explain that logic is used to make different ○ outputs happen on a micro:bit according to ○ changes from its sensors. This logic is created by coding in Free code micro:bit. • Identify that the IF/Else block of code is used to create a form logic. • Use the IF/Else block of code within a program to create a control system. • Identify that the repeat forever command. • Use the repeat forever command in conjunction with IF/Else block to continually check on a sensors environmental conditions that will change outputs according to environmental changes.
<u>Key Vocab</u> Internet, website, search engine, search bar, keywords, virtual assistant, device, crawl, index, rank, relevance, philtre, refine, snippet, exact match, reliable source, fake news	<u>Key Vocab</u> Action, attribute, event, object, tinker, flow chart, sequence, input, selection, if statement, if/ else statement, timer, coordinates, repeat, repeat until, loop, variable, initialise, alert, tag attribute, random	<u>Key Vocab</u> Artificial intelligence(al), data, generative AI, prediction, refine, format, prompt, digital citizenship, privacy, responsible, behaviour, trustworthy/reliable, future technology, innovation, automation, human oversight

Cycle A

UKS 2

<u>Autumn 1</u> Self-image and identity Online relationships	Autumn 2 Online Reputation Online Bullying	Spring 1 Health, Wellbeing and Lifestyle
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Databases NC Link Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.	Spreadsheets NC Links Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.	Coding NC Links Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.
Declarative Knowledge ○ A database contains a set of data that can be searched and sorted to retrieve information. ○ A table-based database contains records and fields. ○ Database tools support interpreting data using functionality including sorting, filtering, grouping and searching. Database tools support interpreting data using functionality including sorting, filtering, grouping and searching. ○ Collaborative databases allow multiple people to work on one set of data at the same time. ○ A well-designed database has built-in validation to ensure correct data formatting. ○ Queries can be built using the database tools to answer specific questions about the data. ○ Some table-based databases have multiple tables of related data. These can be linked on common fields to build complex queries across multiple tables.	Declarative Knowledge ○ A spreadsheet is a digital tool for storing, organising and analysing data. ○ Cells, rows, columns and cell references provide a structure for organising information. ○ Formulas allow spreadsheets to perform calculations automatically, including addition, subtraction, multiplication, division. ○ Conversions rely on known mathematical relationships (e.g. cm–m, mm–cm, g–kg). ○ Line graphs are used to represent continuous data and show trends over time. ○ Continuous data changes smoothly over time, while discrete data represents separate, countable values. ○ Weather data contains measurable patterns that can be compared and interpreted. ○ Budgets are used to plan money, compare costs and make financial decisions. ○ Spreadsheets help solve real-world problems by presenting information clearly and accurately. ○ A good spreadsheet is clear, well labelled, accurate and structured logically.	Declarative Knowledge ○ The way that code is written and structured can improve the ability to debug it, simplify the code and run it more efficiently. ○ A simulation is a model that represents a real or imaginary situation. ○ Abstraction is a way to think about a situation without unnecessary details, enabling a focus on the function of a program. ○ Decomposition is a method of breaking down a task into manageable components. This makes coding easier as the components can then be coded separately and then brought back together in the program. Each part is known as a sub-routine. ○ A function is a named group of commands that a program can run when called by name; reducing the need to rewrite code repeatedly. ○ A datatype defines the type of data, for example, a number or text, and what operations can be performed with it.

○ Databases support the production of automated reports using fields within the data.		○ It is important to initialize variable values to avoid unanticipated bugs in the program. ○ Concatenation is the name given to the action of linking things together in a series. For example, in programs we might want to link words together to form random phrases that are seen by a user of a program.
Procedural Knowledge ○ Use the functionality of the 2Investigate database tool to work with data. ○ Identify, create and edit records and fields of a database. ○ Sort, group and arrange information in a database. • Search for information in a database. • Answer questions involving the interrogation of a database. ○ Add records to a collaborative database. Interrogate the data of a collaborative database. ○ Design a database with validation included. ○ Use the query builder to specify conditions for the data returned. ○ • Use conditional operators correctly when building a database query. ○ Build complex queries across multiple tables to answer questions about the data. ○ Produce automated reports using fields within the data.	Procedural Knowledge ○ Enter data accurately into cells, using rows, columns and headings appropriately. ○ Select, navigate and reference cells to build formulas and structure spreadsheets clearly. ○ Create and edit formulas (e.g. =A2*B2, =A3+B3) and apply them across cells to update calculations efficiently. ○ Apply conversion formulas within spreadsheets to automate unit changes. ○ Create line graphs in 2Calculate by selecting relevant data, choosing a suitable scale, and labelling axes clearly. ○ Sort data into continuous or discrete categories and choose the correct type of graph or representation for each. ○ Input weather datasets and analyse them to identify trends, make predictions or determine risks. ○ Use totals and calculations to compare event costs and stay within a set budget. ○ Use spreadsheets to plan an event, analyse weather, or cost a holiday, making justified decisions based on evidence. ○ Format spreadsheets with headings, consistent layout, neat tables and correctly labelled graphs to improve readability.	Procedural Knowledge ○ Use tags to write code for several objects in one block of commands facilitated by the computer-generated variables for tagged objects. • Use tabs to organise code. • Use functions to reduce the need to repeat blocks of code and make the program easier to read. ○ Explain what a simulation is and provide examples of physical systems that could be made into a simulation. • Plan an algorithm for a physical system such as traffic light sequences using 2Chart. • Use the

Spring 2 Privacy and Security	Summer 1 Managing Online Information	Summer 2 Copyright and Ownership
Word Processing NC Links Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.	Coding External Devices NC Links Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.	Micro:bit NC Link Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.
Declarative Knowledge ○ A word processing tool can be used to create a range of documents. ○ The layout of a document can be altered. ○ Images can be inserted and edited in a word processor. ○ The look and placement of text within a document can be modified. ○ Tables can be used to present information within a document.	Declarative Knowledge ○ External devices can be used to control a coded program. ○ An external device can be used as a game controller. ○ Text can be outputted to an external device. ○ An external device can be used to model real life situations. ○ A program can be written for the external device to meet a specific design brief.	Declarative Knowledge ○ Inputs from an accelerometer, button, pin or sound can be used to initiate a program. ○ Inputs from the micro:bit can be used by the program to control the output from the micro:bit. This can simulate control systems. ○ External equipment, such as crocodile clips and electronic circuitry can be attached to the micro:bit to initiate actions in the program that can produce outputs. ○ Variables can be used to track changes in a program and help with logic.
Procedural Knowledge ○ Recognise different documents that can be produced using a word processor. • Open new blank documents and existing documents. • Identify a range of templates that can be used to create documents. • Navigate around the main toolbar including sub-toolbars for individual objects. • Expand toolbar categories to show additional options. • Save a document and rename it. • Select specific words	Procedural Knowledge ○ Write if something is an output or an input. • Define what an external device is. • Start coding using external device code blocks. • Use a QR code to connect an external device. • Play their simple code. ○ Talk about the features of a game controller. • Complete a partially made game. • Debug their code if it isn't working.	Procedural Knowledge ○ Identify event blocks. • Code using an event block to initiate a program. • Nest code that is to be run inside an event block. ○ Write code that takes actions dependent upon what is being sensed as an input e.g. the temperature. • Identify input code blocks and use them. • Identify output code blocks and use them. • Create a simple piece of code that

to format. • Type sentences and then format them accordingly. ○ Switch between portrait and landscape mode. Change the margins. ○ Search for images online or using stock images. • Download images to a document. • Edit an image using the image handles. • Crop and resize an image. • Wrap text around an image. • Use the various options to change the appearance of an image. ○ Use appropriate keyboard or touchscreen shortcuts for copy, paste and cut. • Use the text formatting toolbar to change the text within the document. • Add headings and subheadings to a document. • Use a range of bullet points including numbered lists. ○ Use bold, underline, italic formatting options purposefully. • Use a range of font choices to suit a document's purpose. ○ Insert a table. • Add in columns and rows to a table. • Change the background colour of a cell in a table. • Distribute rows and columns in a table. • Choose table borders.	○ Find blocks relating to graphics and text. • Choose blocks to output text to the external device. • Write a program to code text to a device. ○ Recognise when an external device can use sensors and how these can be used in code. • Find blocks relating to sensors in the external device (namely shake, tilt and sound detected). • Plan and code a program using sensors. ○ Plan out a program before they start to code. • Code a program written for a specific purpose. • Debug their code if it isn't working. • Share a program with others. • Evaluate a program and make improvements where needed.	simulates a control system. • Use 'if' statements introduce selection. • Combine events, output and variable code blocks to produce code that makes a micro:bit change its output based on environmental changes. ○ Connect crocodile clips to the micro:bit pins anticipating what action will initiate input to the micro:bit. • Write code that responds to input on the pins. ○ Create a number variable. • Initialise a variable value. • Change a variable value when an event is detected. • Use If statements to check the current value of a variable. • Produce outputs based on the variable value.
<u>Key Vocab</u> "Word Processor, Document, Font, Formatting, Editing Bullet Points, Cut, Copy, Paste", Page Margins, Page Orientation, Text Alignment, Styles, Image ,Handles, Text Wrapping, Picture, StylesImage, Styles", Table, Row, Column, Cell, Border", Formatting, Editing, Page Margins, Page Orientation, Text Alignment, Text Wrapping"	<u>Key Vocab</u> QR Code, Input, Output, External Device, Host Device, Simulator, Algorithm, Event, Debug, Variable, Print to Screen, Alert, Function, If/else, Design, Sensor	<u>Key Vocab</u> "Gestures, If Statement, Logic, Variable, Data, Logic, selection, ,Sleep, Repeat, Logic, Random, Variable, Electrical Circuit, Pins, Variable

Cycle B UKS 2		
Autumn 1 Self-image and identity Online relationships	Autumn 2 Online Reputation Online Bullying	Spring 1 Health, Wellbeing and Lifestyle
Blogging/Networks NC Link Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information. Understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration.	Data Detectives NC Link Select, use and combine a variety of software on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.	Coding NC Link Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.
Declarative Knowledge ○ A blog is a regularly updated webpage, written about a particular topic. ○ Blogs consist of several blog posts. ○ A well written blog post has certain features that make the blog clear and easy to understand and increase reader engagement. ○ The ‘hook’ draws the reader into the blog. ○ The look and feel of a blog post makes it clear for the reader to access the information.	Declarative Knowledge ○ A database contains data organised in such a way that it can be queried to find useful information. ○ Query tools exist to help users of a database find information from data stored within it. ○ Chart tools can be used to make graphs from data contained within a database. ○ Some databases will need multiple tables of data. ○ Queries can be created that query data from multiple tables.	Declarative Knowledge ○ Cloning is a process where additional objects can be created while the program is running. ○ Objects can be draggable in 2Code to provide another way for the user to interact with them. ○ Hotspots can be created in 2Code. These are a type of object that can be used to make a specific area of the screen react to actions such as objects entering or leaving the area.

○ The look and feel of a blog post makes it clear for the reader to access the information. The look and feel of a blog post makes it clear for the reader to access the information. ○ The conclusion of a blog post ties the information in the post together. ○ The process of writing a blog post requires planning, drafting, revising and editing before publication. ○ Engaging with readers is crucial to the success of a blog. ○ Moderation exists to make the blogging environment a safe place for its readership and authors.	○ Bespoke multiple conditions can be made that help a user find the exact information being asked.	○ Using a combination of coding structures and objects allows the design of interactive and creative programs. ○ Variables can have different designated datatypes. The datatype will impact how the value of the variable can be used. ○ There are a variety of ways of receiving input from users and then using this input. ○ A flowchart is a diagram that uses specifically shaped, labelled boxes and arrows to represent an algorithm as a diagram. ○ Using functions helps with making programs more efficient. Instead of writing the same sequence of code repeatedly ○ Design documentation is vital when producing more complex programs. The process of designing supports abstraction and decomposition of the task at hand. ○ Text-based adventures are computer games that have been created using text instead of graphics. Players use text commands to control characters and influence the environment.
Procedural Knowledge ○ Give examples of topics for existing or prospective blogs. ○ Create a blog post. ○ Plan the hook, look and feel, conclusion and reader engagement for a blog post. ○ Use an appropriate hook for a blog post by including either a quote, a story, a question or an observation to grab the reader's interest. ○ Write a blog post that is easy to follow, uses lists or bullets, bolds key information	Procedural Knowledge ○ Identify tables, records and fields. • Explain the data types contained within each field on a record. • Identify any format types applied to fields. • Use query tools to find useful information. ○ Use the filter tool to create conditions. • Use the grouping tool to group related information together as part of a query. • Use the calculate tool to apply calculations to selected data that provides meaningful results. • Use the sort tool to change the order	Procedural Knowledge ○ Write code to clone objects and loop through the clones to change their attributes. ○ Make objects draggable in a program. ○ Create hotspots and write code that controls the flow of the program when objects enter and leave hotspots. ○ Use code to create effects when combining the use of draggable objects, hotspots and cloning in conjunction with sequences, repetition and selection.

and uses an appropriate conversational style. ○ Write a conclusion that summarises the main points of the post and might give the reader advice. ○ Follow the plan, draft, revise and edit process before publishing a blog post. ○ Read and respond to comments on their blog post. • Use commenting to increase engagement and guide future blog posts. ○ Decide whether content conforms to appropriate netiquette guidance. • Report posts or comments that violate community or legal guidelines.	records are presented according the field selected and the value order (increase/decrease). ○ Use the chart tool to select specific fields from a database for the x and y values on a graph. • Select the most appropriate graph type to display selected data so it makes sense in relation to a query given. ○ Identify differences in data held in individual tables that make a complete database. • Explain why the data can't be all held on one table. ○ Link tables together by using a common field. • Produce queries that query data from linked tables. ○ Create multiple condition and can join those using the AND/OR operator. • Use the AND/OR operator correctly and recognise the difference between the two and the impact this has on results when run.	○ Make conscious choices about datatype when creating variables. • Anticipate effects such as calculating using variable values, concatenation of string variables and bugs that could occur due to datatypes when user input is used. ○ Use 'Prompt for input' and 'get input' commands to receive input from the user of a program and write code using variables to work with user input. ○ Use if statements that include checking of a value of a user input and changing a variable if user input has met the if statement condition. ○ Interpret flowcharts and use these as a basis to begin coding or debugging a program. • Create flowcharts to represent algorithms. • Include sub-routines within flowcharts to help with more complex program ideas. ○ Create functions and write code for function calls. • Interpret programs that include functions to explain the purpose of the function. ○ Interpret design documentation, commenting on the level of abstraction and the way that a task has been decomposed. • Use user interface designs to create the look of a program. • Use flowcharts to decide upon the structure of a program and what functions might be required. ○ Review the code of a text-based adventure game and relate this to game play when the code is running. • Identify how variables, functions, selection and repeat loops are used to make the program function. • Adapt
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		the code maintaining the structure but changing the game play.
<u>Key vocab</u> Blog, Blog post, Vlog, Plan, Draft, Revise, Edit, Publish, Hyperlink, Commenting, Approval, Netiquette, Moderation"	<u>Key Vocab</u> Condition, Data, Database, Field, Filter, Record, Sort, Bar Chart, Calculate, Group, Line Graph, Linked Tables, Query, Calculate, Filter, Group, Query, Sort	<u>Key vocab</u> Object, Attribute, Variable, Timer, Co-ordinates, Clone Draggable attribute Repeat Over, Object, Attribute Clone, Repeat Over, Hotspot, Datatype, Variable Input, Concatenation, Tinker, Algorithm Debugging, Function, Flowchart, Simulation Sub-routine, Design, Sub-routine, Function Abstraction, Decomposition, User interface Variable, Selection, Function, Repeat Until Text-based adventure
Spring 2 Privacy and Security	Summer 1 Managing Online Information	Summer 2 Copyright and Ownership
Spreadsheets NC Link Select, use and combine a variety of software on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.	Binary NC Link Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.	Micro:bit NC Link Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.
Declarative Knowledge - There are key features of a spreadsheet, and data can be entered into cells. - Formulae can be entered into a spreadsheet; this can save time and make working more efficient. - Spreadsheet software can make complex data clear by manipulating the way it is presented.	Declarative Knowledge - Binary is a number system using only the integers 1 and 0. It is also known as base 2. - In day-to-day life, we use the decimal system, also known as base-10 and denary. - Binary is how data in a computer is saved and processed to make everything happen.	Declarative Knowledge - A micro:bit has pins that can be used to detect inputs. - Free Code micro:bit can be used in conjunction with the micro:bit's pins to create a range of outputs when a circuit is detected. - A micro:bit has a range of sensors that can be used to collect environmental data.

○ A spreadsheet can be used to model a situation. ○ Functions can be used for calculating averages and maximum and minimum values in spreadsheets. ○ A spreadsheet program can display a variety of graphs and charts. ○ Using sorting and filtering tools can allow you to interrogate large amounts of data quickly and easily. ○ A spreadsheet can be created to model a real-life situation and solve problems.	○ A bit is the most basic unit of information in computing. ○ The sequence of bits doubles each time e.g. 1,2,4,8,16,32 ○ It is possible to count from 0 to infinity using binary. ○ All decimal numbers can be converted into binary. ○ When coding, binary game states are often used to control the flow of the program, these values are stored using variables.	○ 2Graph can be used to program a micro:bit to collect data. ○ Data collected by a micro:bit can be transferred into 2Graph and presented in a table and chart.
Procedural Knowledge ○ Talk about some uses of a spreadsheet. • Navigate around the front screen of their chosen program. • Navigate around a sheet using appropriate cell references. • Enter data into cells of the chosen program. • Recall key vocabulary relating to spreadsheets. ○ Define what is meant by a formula on a sheet. Navigate around a sheet by clicking in a cell or typing cell reference. • Write simple formula related to the rules of calculation. • Use the series fill function. • Use formulae to change calculations automatically when data entered is changed. ○ How to change the height and width of a cell and row. • Enter header titles into a sheet. • Split cells for ease. • Sort data in a sheet using the appropriate feature. ○ Use the sum feature when typing a formula. • Format cells as currency. • Use a computational model in a real-life situation.	Procedural Knowledge ○ Compare the integers used in decimal to those used in binary. ○ Compare the integers used in decimal to those used in binary. ○ Explain that the 0 and 1 integers in binary relate to the millions of switches within the computer being in an off state (0) or an on state (1). • Recognise when information is transferred and turned into action. For example, the letter 'A' appearing on the screen when the user types 'A' on the keyboard. ○ Represent a single bit as a value of either a 0 or 1. ○ Create decimal values by adding bits together. ○ Count in binary using equipment such as binary cards to support them. ○ Convert decimal numbers to binary using the divide-by-two method. ○ Describe where coded programs might have used binary game states to control the flow. • Make a	Procedural Knowledge ○ Connect crocodile clips to a numbered pin and the gnd pin to make an electrical circuit that the micro:bit detects as an input. • Use the 'when pin' command in Free Code micro:bit to create an event that triggers when an input with a pin is detected. ○ Create variables that count the number of times pin input has been detected and use this variable to display as an output. • Use text, image and sound outputs when an input is detected. • Use the sleep command to control when code is executed. ○ Identify the sensors on the micro:bit and explain how these could be used to collect useful information. ○ Connect a micro:bit to 2Graph. • Set up a micro:bit within 2Graph specifying the sensors to be used and the sampling data intervals. • Download the software onto the micro:bit and start data logging

○ Add data to a table format. • Create formulae using cell references. • Use more advanced formula other than SUM ○ Recap the knowledge of the different axis in a graph based on learning in other subjects. • Create a range of graphs and charts depending upon the version being used. ○ Sort data in a sheet by alphabetical or numerical order. • Clear the filters after a search to make the hidden rows visible again. • Use and apply a variety of text and number filters. • Explain that rows that do not meet the criteria are not deleted; they are temporarily hidden from view. ○ Understand the advantages of using formulae when data is liable to change. • Use the skills gathered over the unit to solve a series of problems. • Plan an event using a spreadsheet	simple program that uses variable values of 0 and 1 to control the flow of the program.	○ Upload collected data from a micro:bit into 2Graph. ○ • Modify data to be presented in the most readable way in order to analyse it.
<u>Key Vocab</u> Cell, Row, Column , Workbook, Worksheet, Formatting, Formula, Function, SUM, AVERAGE, MAX/MIN, Chart, Chart Labels, Sort, Filter, COUNTA, COUNT, COUNT IF, IF	<u>Key Vocab</u> Binary, Integer, Transistor, Nanotechnology, Bit, Decimal, Remainder, Game states, Variable, Design, Object, Action	<u>Key Vocab</u> "Conductivity, Electrical Circuit, Pins, Sleep, Variable, Accelerometer, Chart, Data, Data Logging, Sensor Chart, Data, Data Logging, Sensor, Chart, Data Data Logging, LED, Sensor