Computing Knowledge Progression – Declarative Knowledge

Declarative Knowledge – What the children will know….

EYFS – Mousepad and Keyboard Skills	EYFS – Photography and Sounds	EYFS – Robots	EYFS – Hardware
• I know how to use a laptop touchpad. • I know how to find all the letters of the alphabet on a keyboard. • I know how to put spaces between words in my typed work. • I know how to correct typed work without re-doing the work entirely using the delete keys. • I know how to type capital letters and lower case and how to change between these. • I know how to type numbers using a keyboard. • I know how to move to the next line down when typing. • I know how to use the arrow keys to move around the screen. • I know how to use the different inputs of a computer keyboard.	• I know how to make music using a computer. • I know how to add sound effects to my work. • I know how to use a device to record myself speaking and play back the sounds. • I know what photos show. • I know how to take photos using a digital device. • I know how to use the webcam in Mini Mash. • I know how to open photos in Purple Mash. • I know how to open photos that I have taken in Purple Mash.	• I know how to talk about where I am moving a toy vehicle whilst I am moving it. • I know how to describe the route taken by a toy vehicle. • I know how to follow directions to make a route for a toy vehicle. • I know how to plan a route for a toy vehicle. • I know how to follow my own plan for where the toy vehicle should move.	• I know why having clean hands is important when using shared devices. • I know why it is not sensible to eat and drink whilst using a technological device. • I know why I need to take care with electronic devices and their plugs and wires. • I know what appropriate actions to take when I need to carry a device to a different location. • I know how to use devices with care. • I know how to identify the technology used around me. • I know how to identify the parts of a computer and what they are for.

Year 1 – Animated Stories	Year 1 – Data Explorers	Year 1 - Technology around us	Year 1 – Creating and Following Instructions	Year 1 – Coding
• Images can be created within the software. • Digital books can have animations. • Know what animation means. • Audio such as sound effects and music can be included. • The style of text is called the font. The font can be changed.	• To know items can be grouped together in lots of different ways. • Digital Tools (Computers) can group images of items. • To know that sorting is a way to organise items. • To know sorting and grouping having different meanings. • To know data is information that can be collected and used. • To know data can be represented digitally.	• Technology is something that is used to solve problems or make things easier. • Technology is used almost everywhere. • Not all technology is digital i.e. • Hard is used to describe physical parts of a device i.e. keyboard. We must technology safely.	• To achieve a specific effect, accurate instructions must be followed. • Computer Programs need precise instructions called algorithms • Instructions must be specific. • The order of instructions for a task affects the results. • Correcting errors in an algorithm or program is called debugging.	• To know computer programs work by following instructions called algorithms. • Code is created using coloured blocks. • Each instruction is called a command. • An event is something that makes a block of code run in response to an action. Debugging is the name for fixing code that isn't working.

Year 2 –Creating Pictures	Year 2 - Spreadsheets	Year 2 – The Internet	Year 2 - Route Explorers	Year 2 - Coding
• Digital art tools usually have a choice of painting effects. • Painting effects can be combined to help a user make pictures of varying 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.	• To know what a Spreadsheet is. • To know what columns and rows are. • To know what a cell is. • To know that spreadsheets can carry out calculations automatically.	• The Internet is a connected computers around the world. • The Internet allows people to communicate with others. (Being Online) • An Internet connection can be made using wires or wirelessly. • What a browser is. • What the World Wide Web is. • Smart devices can connect to the internet. • What a homepage is. • Webpages have links to other webpages. • Websites can be found using a search engine.	• What a command is in 2Go. • Commands can be input into 2Go to control the movement of a screen turtle. • Planning a route is important 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 called an algorithm, • Mistakes/Errors are called bugs. • Fixing the errors is called debugging.	• To know a set of instructions is known as an algorithm. • To know collision detective is a way to cause an action when two objects collide. • Programs follow a sequence of instructions (commands) in order. • To know timer commands can be used to make parts of the program run after a set time. • To know what execute and interaction means. • To know event commands are used to create blocks of code that are run when an event happens. • To know what debugging is the process of testing that a program and looking for and fixing any problems.

Year 2/3 – Spreadsheets	Year 2/ 3 – The Internet	Year 2/3 – Route Explorers & Planners	Year 2 /3 – Coding and Introduction to Repetition.
• To know what a Spreadsheet is. • To know what columns and rows are. • To know what a cell is. • To know that spreadsheets can carry out calculations automatically.	• The Internet is a connected computers around the world. • The Internet allows people to communicate with others. (Being Online) • An Internet connection can be made using wires or wireslessly. • What a browser is. • What the World Wide Web is. • Smart devices can connect to the internet. • What a homepage is. • Webpages have links to other webpages. • Websites can be found using a search engine.	• What a command is in 2Go. • Commands can be input into 2Go to control the movement of a screen turtle. • Planning a route is important 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 called an algorithm, • Mistakes/Errors are called bugs. • Fixing the errors is called debugging. • The turtle can be set to rotate by angles of 90° both clockwise and anticlockwise.	• To know a set of instructions is known as an algorithm. • To know collision detective is a way to cause an action when two objects collide. • Programs follow a sequence of instructions (commands) in order. • To know timer commands can be used to make parts of the program run after a set time. • To know what execute and interaction means. • To know event commands are used to create blocks of code that are run when an event happens. To know what debugging is the process of testing that a program and looking for and fixing any problems.

Year 3 – Unpacking Hardware	Year 3 - Spreadsheets	Year 3 – Route Planners	Year 3 - Coding
• To know technology helps solve problems or makes tasks easier. • To know electrical, digital and smart technology are different forms of technology.	• To know what a spreadsheet is. • To know what rows and columns are. • To know about cell addresses. • To know about the formula bar and its uses.	• What a command is in 2Go. • Commands can be input into 2Go to control the movement of a screen turtle. • The screen turtle can rotate by angles of 90 and 45 angles.	• To know timers can control when a block of commands run. • To know timers can be run after a delay or intervals.

• To know hardware describes the physical parts of a computer. • To know software describes the programs that tell a computer to complete a task. • To know software and hardware operate together.	• To know and explore how tools can be combined in 2 calculate. • To know how to use the line graphing tool.	• Planning a route is important to input the correct commands. • Routes can be programmed to perform more than one command in a sequence. • Routes can be programmed to repeat (repetition) a sequence of commands a set number of times i.e. x4. • A list of instructions for a route is called an algorithm, • Mistakes/Errors are called bugs. • Fixing the errors is called debugging.	• To know repeat is a control block allowing blocks of commands to repeat. • To know testing and debugging are very important. • To know what nesting is.	
Year 4 - Animation	**Year 4 – Composing Beats**	**Year 4 – Logo**	**Year 4 - Microbits**	**Year 4 - Coding**
• Some animations are created by hand and others with the help of technology. • Animation software has specific functions that help the animation of still images. • Sound effects, timings and frames per second setting can improve an animation. • Storyboarding supports planning an animation.	• In digital music, rhythm is made up of sample sounds. • A sample is a short recording of a sound. • In digital music, a melody is made up of synths. • Synths are electronic music instruments sounds. • A piece of music on Busy Beats is created with a range of samples and synths.	• Logo is a text based coding language. • Commands are written to control the movement of the screen turtle. • Spacing of commands in Logo is important. • Logo commands can be repeated a set number of times using the repeat command. • What a procedure is. (A named set of Logo commands) • Errors happen because commands have been input incorrectly. • Fixing errors is called debugging.	• Sensor Inputs can be used to detect changes in the environment. • Variables are used to keep track of changes in a program. • They can be used to help with decisions a computer can make. • Inputs, outputs and computer code work together to make control systems.	• 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. • 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.
Year 5 - Game Creator	**Year 5 - Databases**	**Year 5 - Spreadsheets**	**Year 5 - Microbits**	**Year 5 - Coding**
• There are criteria which determine the playability of a game. • It is important to plan and design a game before making it. • The visual and audio properties of a game should fit with the theme.	• A database contains a set of data than can be sorted and searched. • A table based database contains records and fields. • Database tools support interpreting data. • Queries can be built using the database tools to answer	• A spreadsheet stores, organises and analyses data. • What cells, columns and rows are. • Formulas allow spreadsheets to perform calculations automatically. • Spreadsheets help solve real world problems.	• 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.	• To know the way that code is written and structured can improve the ability to debug it, simplify the code and run it more efficiently. • To know a simulation is a model that represents a real or imaginary situation.

• It is important to give the player good instructions to enable them to enjoy the game. • Evaluation is important so a game can be improved.	specific questions about the data.	• A good spreadsheet is clear, well-labelled, accurate and structured correctly.	• 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	• To know abstraction is a way to think about a situation without unnecessary details, enabling a focus on the function of a program. • To know 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. • To know a function is a named group of commands that a program can run when called by name; reducing the need to rewrite code repeatedly. • To know 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.

Year 6 - Blogging	Year 6 - Networks	Year 6 - Coding
• What a blog is. • Blogs have several blog posts. • Features of a well written blog post. • Engaging with readers is crucial to the success of a blog. • Moderation exists to make the environment a safe place.	• A network is a connected group of computers that can share information and hardware resources. • LAN and WAN are and that they are different kinds of networks. • To know the hardware required to create a network. • Networks can be wired and/or wireless • The difference between the World Wide Web and The Internet. • Filtering and Censorship are used to make parts of the internet less accessible for different reasons.	• Know the cloning process. • Objects can be draggable in 2Code. • Hotspots can be created in 2Code. • Variables can have different designated datatypes. • There are a variety of ways of receiving inputs from users and then using this input. • To know a flowchart in relation to 2Code. • Using functions helps with making programs more efficient. • Designing is vital when producing more complex programs. • To know what text based adventures are.

Computing Knowledge Progression – Procedural Knowledge

Procedural Knowledge – What the children will know how to….

EYFS – Mousepad and Keyboard Skills	EYFS – Photography and Sounds	EYFS – Robots	EYFS – Hardware
• I can use a laptop touchpad. • I can find all the letters of the alphabet on a keyboard. • I can put spaces between words in my typed work. • I know how to correct typed work without re-doing the work entirely using the delete keys. • I can type capital letters and lower case and know how to change between these. • I can type numbers using a keyboard. • I know how to move to the next line down when typing. • I can use the arrow keys to move around the screen. • I can use the different inputs of a computer keyboard.	• I can make music using a computer. • I can add sound effects to my work. • I can use a device to record myself speaking and play back the sounds. • I can talk about what photos show. • I can take photos using a digital device. • I can use the webcam in Mini Mash. • I can open photos in Purple Mash. • I can open photos that I have taken, in Purple Mash.	• I can talk about where I am moving a toy vehicle whilst I am moving it. • I can describe the route taken by a toy vehicle. • I can follow directions to make a route for a toy vehicle. • I can plan a route for a toy vehicle. • I can follow my own plan for where the toy vehicle should move.	• I can understand why having clean hands is important when using shared devices. • I can understand why it is not sensible to eat and drink whilst using a technological device. • I can understand why I need to take care with electronic devices and their plugs and wires. • I can take appropriate actions when I need to carry a device to a different location. • I can use devices with care. • I can identify the technology used around me. • I can identify the parts of a computer and what they are for.

Year 1 – Animated Stories	Year 1 – Data Explorers	Year 1 - Technology around us	Year 1 – Creating and Following Instructions	Year 1 – Coding
• Use painting tools to create a picture. • Apply animation effects to images. • Copy and paste. • Record a sound for the story. • Insert sound effects and music. • Change the font and size of text.	• Sort items using a criteria. • Decide whether it is better to sort or group items to organise them. • Identify items to be grouped or sorted as examples of data. • Use data to answer questions. • Create a pictogram using data collected in class. • Answer questions using a pictogram. • Collect and record data. • Input Data into the 2count tool.	• Recognise examples of technology. • Describe the purpose of common types of tech i.e. traffic lights. • Identify tech in school or at home. • Give examples of digital technology. • Name examples of hardware i.e. screen, mouse, keyboard. Use devices safely.	• To give clear, precise and concise instructions for someone to follow. • Check whether instructions have been followed by comparing the outcome (finished) is the same as the instructions. • Use a computing device to follow simple instructions. (In 2Paint) • Identify when a sequence of instructions is incorrect and why. • Explore possible outcomes of following incorrectly sequenced instructions. • Find errors in a simple algorithm. • Correct an algorithm.	• Create instructions in the form of simple algorithms. • Interpret what a piece of code means. • Recognise the different colour blocks in 2Code and what they are. • Drag code blocks into the coding area to create commands. • Understand how code blocks fit together. • Make a simple command in 2code by using an object and action together. • Excute the corde to see the effect by clicking run. • Test 'When Clicked' events. • Begin to use logical reasoning to find where bugs in the code are. • Fix bugs in code.

			• Recognise when an algorithm has been debugged. Apply learning about debugging.	
Year 2 –Creating Pictures	**Year 2 - Spreadsheets**	**Year 2 – The Internet**	**Year 2 - Route Explorers**	**Year 2 - Coding**
• Explore the range of painting effects in 2Paint. • Observe how the painting effects give different results. • Produce digital images in traditional art styles using digital painting effects. • 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. help a user compose an image. • Make use of outline features, such as selecting, resizing, and editing outlines, to enhance their digital art.	• To be able to navigate around a spreadsheet and enter data. • To be able to enter data into cells. • To be able to identify a cell by its name. • To resize rows and columns to make data clearer. • To inset images and assign them numerical values. • To apply calculations tools in a spreadsheet. • To use the is equals tool to check whether a calculation is correct. • To create block diagrams in 2Calcuate.	• Explain the difference between the Internet and the World Wide Web. • Explain that Wi-Fi describes a wireless internet connection. (Points out a wireless symbol) • Recognises a web browser (Chrome, Safari) • Find information on our school's website. • Gives examples of smart devices. • Navigate to our school's homepage by searching for the school. • Use a link on a webpage of a school's website. • Use keywords to search for information using a search engine.	• Input commands. • Use techniques such as finger movements to plan a route. • Input several commands into a sequential algorithm. • Plan the route by writing an algorithm first. • Make logical attempts to debug code for routes. Reset, debug and re-run the code to test routes.	• Follow a written algorithm. • Identify collision detection. • Use collision detection blocks. • Identify the timer command. • Use the time after command. • Recognise the event command blocks – when key, when swiped, when clicked and collision detection. • Use specific event commands for specific objects. • Use logical reasoning to identify the source of the bugs and attempt to fix them. • Test and debug code.

Year 2/3 – Spreadsheets	**Year 2/ 3 – The Internet**	**Year 2/3 – Route Explorers & Planners**	**Year 2 /3 – Coding and Introduction to Repetition.**
• To be able to navigate around a spreadsheet and enter data. • To be able to enter data into cells. • To be able to identify a cell by its name. • To resize rows and columns to make data clearer. • To inset images and assign them numerical values. • To apply calculations tools in a spreadsheet. • To use the is equals tool to check whether a calculation is correct. • To create block diagrams in 2Calcuate.	• Explain the difference between the Internet and the World Wide Web. • Explain that Wi-Fi describes a wireless internet connection. (Points out a wireless symbol) • Recognises a web browser (Chrome, Safari) • Find information on our school's website. • Gives examples of smart devices. • Navigate to our school's homepage by searching for the school. • Use a link on a webpage of a school's website. • Use keywords to search for information using a search engine.	• Input commands. • Use techniques such as finger movements to plan a route. • Input several commands into a sequential algorithm. • Plan the route by writing an algorithm first. • Make logical attempts to debug code for routes. • Reset, debug and re-run the code to test routes. • Input commands that rotate the turtle to face the desired direction for movement using 90° angles.	• Follow a written algorithm. • Identify collision detection. • Use collision detection blocks. • Identify the timer command. • Use the time after command. • Recognise the event command blocks – when key, when swiped, when clicked and collision detection. • Use specific event commands for specific objects. • Use logical reasoning to identify the source of the bugs and attempt to fix them. • Test and debug code.

Year 3 – Unpacking Hardware	Year 3 - Spreadsheets	Year 3 – Route Planners	Year 3 - Coding
• Identify if an item is an example of technology. • Decide if an item is an example of digital, electronical or smart technology. • Name hardware components of a computer system. • Explain what different software tools are used for, the parts they have in common, and how these help people complete tasks. • Explain how something works by describing what goes in (inputs), what the computer uses to work (hardware and software), and what comes out (outputs).	• To create a table of data on a spreadsheet. • Use the spreadsheet data to create charts and graphs. • To describe a cell location. • To find a specified locations in a spreadsheet. • To enter formulae into the formulae bar. • To create formulae to complete calculations. • To combine tools to make ways to explore numbers. • To use data and create a line graph.	• Input commands. • Use techniques such as finger movements to plan a route. • Input several commands into a sequential algorithm. • Plan the route by writing an algorithm first. • Make logical attempts to debug code for routes. • Reset, debug and re-run the code to test routes. • Input commands that rotate the turtle to face the desired direction for movement using 90° angles. • Use the repeat algorithm layout to use repetition.	• To include a timer within code to make an event happen repeatedly. • To identify when a repeat command would be beneficial. • Use a repeat command. • Read examples of code that includes nesting to predict the outcome. • Test what happens when changing how a program is nested. I.e. moving a timer so that it is nesting within a timer that is currently nested. • Use knowledge of nesting to debug a program.

Year 4 - Animation	Year 4 – Composing Beats	Year 4 – Logo	Year 4 - Microbits	Year 4 - Coding
• Compare the process of animating by hand to the use of animation technology. • Use 2Animate to make simple animations. • Choose appropriate sound effects and speeds for animations. • Use storyboarding to plan an animation.	• Create a beat using samples. • Adjust the tempo of a rhythm by changing the BPM. • Create their own simple melodies using synths. • Adjust the pitch of a note using a synth board. • Experiment with different samples and synths. • Create and record their own piece of music on Busy Beats.	• Input commands to make the turtle move. • Input directional commands and more abstract non-directional commands. • Space commands correctly and debug when errors occurs. • 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. • Make logical attempts to debug Logo code.	• Explain what the accelerometer is. • Explain what the light sensor is. • Write code that uses light sensors and accelerometer inputs. • Explain that variables hold a value. • Create a number variable in a program • Change a number variable in a program. • Explain that inputs and outputs and computer code can worth together to make a simple system. • Identify input and output code blocks. • Identify the control blocks of code: repeat, if and else. • Create a simple piece of code that makes up a control system.	• Change object attributes in design view. • Choose object type with an understanding of the possible object attributes and actions. • 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

		• Make use of multi-line mode for more complex code to enable easier debugging.		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.
Year 5 - Game Creator	**Year 5 - Databases**	**Year 5 - Spreadsheets**	**Year 5 - Microbits**	**Year 5 - Coding**
• Evaluate the playability of a video game. • Make a 3D game using 2DIY 3D • Use a design document to plan and design the game. • Choose appropriate textures and audio for the game. • Design the collectable quest items and add movement, sound effects and actions. • Consider where to place the collectable quest items so it is possible to finish the game. • Place sprites in the game in such a way as to provide challenge but not make it impossible to play. • Select appropriate penalties for encountering an enemy. • Create useful instruction screens for players. • Evaluate games made by their peers using given criteria. • Read evaluations of their game from others. • Make appropriate improvements to their game	• Use the functionality of the 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. • Use the query builder to specify conditions for the data returned. • Use conditional operators correctly when building a database query.	• 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 graph 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,	• 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 simulates a control system. • Use 'if' statements to 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.	• Use tags to write code for several objects. • Use tabs to organise code. • Use functions to reduce the need to repeat blocks of code. • Recognise what abstraction is, why it is important and use abstraction when planning a program. • Use decomposition to break down the plan into key parts and use decomposition to organise code. • Create functions in 2Code and call these functions appropriately instead of repeating code. • Recognise where concatenation can be useful in programs. • Demonstrate concatenation in other programmes such as linking a variable (score) with text (well done) or a game. • Debug programs that involve concatenation errors in strings.

		• making justified decisions based on evidence. • Format spreadsheets with headings, consistent layout, neat tables and correctly labelled graphs to improve readability	• 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.	

Year 6 - Blogging	Year 6 - Networks	Year 6 - Coding
• Create a blog post. • Plan the gook, look and feel, conclusion and reader engagement. • Use an appropriate hook for a blog post. • Write a blog post that is easy to follow. • Write a conclusion that summarises the post. • 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. • Report posts or comments that violate community or legal guidelines.	• Explain the difference between LAN and WAN • Create a network diagram that incudes hardware such as router. • Describe the difference between the Internet and WWB giving examples of the services that both provide. • Explain the differences between internet filtering and censorship and why they are used.	• Write code to clone objects. • Make objects draggable. • Create hotspots in 2Code. • Use code to create effects when combing previous taught skills. • Make choices about datatype when creating variables. • Use prompt for input and get input commands. • Use if statements. • Interpret and create flowcharts. • Create functions and write code for function calls. • Comment on the level of abstraction and the way a task has been decomposed. • 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 the code maintaining the structure but changing the game play.