Year 4 Computing Overview

Key Concepts NC PoS Reference	Vocabulary	Knowledge (specific facts or truth components. A knowledge statement will often contain substantive, declarative or explicit knowledge.) Composite Knowledge	Skills (the use and application of composite knowledge. A skill statement will often contain implicit, procedural and disciplinary knowledge.) Components (small steps)
Unit 4.1 Coding – Design, Code, Test and Debug IF Statements Co-ordinates Repeat Until and IF/ELSE Statements Number Variables Making a Playable Game	Unit 4.1 Coding Action: The way that objects change when programmed to do so. For example, move. • Alert: This is a type of output. It shows a pop up of text on the screen. • Algorithm: a precise, step-by-step set of instructions used to solve a problem or achieve an objective. • Background: In 2Code the background is an image in the design that does not change. • Button: A type of object that responds to being clicked on. • Code blocks: A way to write code using blocks which each have an object or an action. • Command: A single instruction in 2Code. • Co-ordinates: Numbers which determine the position of a point, shape or object in a particular space. • Debug\ Debugging: Fixing code that has errors so that the code will run the way it was designed to. • Design: In coding, this is a plan for the program showing the visual look of the user interface (the screen) with the objects. The algorithm can be represented as part of the design, showing actions and events. • Event: An occurrence that causes a block of code to be run. The event could be the result of user action such as the user pressing a key (when Key) or clicking or swiping the screen (when Clicked, when Swiped). In 2Code, the event commands are used to create blocks of code that are run when events happen. • Execute: This is the proper word for when you run the code. We say, 'the program (or code) executes.' • Flowchart: A diagram that uses specifically shaped, labelled boxes and arrows to represent an algorithm as a diagram. • 'If' statement: A computer uses an IF statement to decide which bit of code to run. IF a condition is true, then the commands inside the block will be run. • 'If/Else' statement: A conditional command. This tests a statement. If the condition is true, then the commands inside the 'if block' will be run. If the condition is not met, then the commands inside the 'else block' are run. • Input: Information going into the computer. This could be the user moving or clicking the mouse, or the user entering	• To review coding vocabulary and knowledge. • To create a simple computer program. • To begin to understand selection in computer programming. • To understand how an IF statement works. • To understand how to use co-ordinates in computer programming. • To understand how an IF statement works. • To understand the Repeat until command. • To begin to understand selection in computer programming. • To understand how an IF/ELSE statement works. • To understand what's variable is in programming. • To use a number variable. • To review vocabulary and concepts learnt in Year 4 Coding. • To create a playable game.	• Children can explore different object types in 2Code. • Children can use a background and objects to create a scene. • Children can plan an algorithm for their screen and use 2Code to program it. • Children can create a program that includes an IF statement • Children can interpret a flowchart that depicts an IF statement. • Children can make use of the X and Y properties of objects in their coding. • Children can relate a program that includes an IF statement.. • Children can read code that includes repeat until and IF/ELSE and explain how it works. • Children can create a program that includes and IF/ELSE statement. • Children can interpret a flowchart that depicts an IF/ELSE statement. • Children can explain what a variable is in programming. • Children can create and use variables when programming. • Children can read code that includes repeat until and IF/ELSE and explain how it works. • Children can create a program that includes and IF/ELSE statement. • Children can interpret a flowchart that depicts an IF/ELSE statement.
Unit 4.2 – Online Safety Going Phishing Beware Malware Plagiarism Healthy Screen-Time		• To understand how children can protect themselves from online identity theft. • To understand that information put online leaves a digital footprint or trail and that this can aid identity theft. • To identify the risks and benefits of installing software including apps. • To understand that copying the work of others and presenting it as their own is called 'plagiarism' and to consider the the consequences of plagiarism. • To identify appropriate behaviour when participating or contributing to collaborative online projects for learning.	• Children know that security symbols such as a padlock protect their identity online. • Children know the meaning of the term 'phishing' and are aware of the existence of scam websites. • Children can explain what a digital footprint is and how it relates to identity theft. • Children can give examples of things that they would not want to be in their digital footprint. • Children can identify possible risks of installing free and paid for software. • Children know that malware is software that is specifically designed to disrupt, damage, or gain access to a computer. • Children know what a computer virus is. • Children can determine whether activities that they undertake online, infringe another's' copyright. They

	characters on the keyboard. On tablets there are other forms such as finger swipes, touch gestures and tilting the device. Nest: When coding commands are put inside other commands. These commands only run when the outer command runs. • Object: Items in a program that can be given instructions to move or change in some way (action). In 2Code Gibbon, these include character, turtle, button, vehicle, animal, food, shape, number, input and label. • Prompt: A question or request asked in coding to obtain information from the user in order to select which code to run.	• To identify the positive and negative influences of technology on health and the environment. • To understand the importance of balancing game and screen time with other parts of their lives.	know the difference between researching and using information and copying it. • Children know about citing sources that they have used. • Children can take more informed ownership of the way that they choose to use their free time. They recognise a need to find a balance between being active and digital actives. • Children can give reasons for limiting screen time.
Unit 4.3 – Spreadsheets Formula Wizard and Formatting Cells Using the Timer and Spin Buttons Line Graphs Using a Spreadsheet for Budgeting Exploring Place Value with a Spreadsheet	• Implement: When a design is turned into a program using coding. • Predict: Use your understanding of a situation to say what will happen in the future or will be a consequence of something. • Repeat: This command can be used to make a block of commands run a set number of times or forever. • Repeat until: In 2Code this command will repeat a block of commands until a condition is met. • Run: Clicking the Play button to make the computer respond to the code. • Properties: These determine the look and size of an object. Each object has properties such as the image, scale and position of the object. • Selection: Selection is a decision command. When selection is used, a program will choose which bit of code to run depending on a condition. • Sequence: This is when a computer program runs commands in order.	• To explore how the numbers entered into cells can be set to either currency or decimal. • To explore the use of the display of decimal places. • To find out how to add formulae to a cell. • To explore how tools can be combined to use 2Calculate to make number games. • To explore the use of the timer, random number and spin button tools. • To use the line graphing tool in 2Calculate with appropriate data. • To interpret a line graph to estimate values between data readings. • To use the currency formatting tool in 2Calculate. • To use 2Calculate to create a model of a real-life situation. • To use the functions of allocating value to images in 2Calculate to make a resource to teach place value.	• Children can use the number formatting tools writhing 2Calculate to appropriately format numbers. • Children can add a formula to a cell to automatically make a calculation in that cell. • Children can use the timer, random number and spin button tools. • Children can combine tools to make fun ways to explore number. • Children can use a series of data in a spreadsheet to create a line graph. • Children can use a line graph to find out when the temperature in the playground will reach 20 degrees C. • Children can make practical use of a spreadsheet to help them plan actions. • Children can use the currency formatting in 2Calculate. • Children can allocate values to images and use these to explore place values. • Children can use a spreadsheet made in 2Calculate to check their understanding of a mathematical concept.
Unit 4.4 – Writing for Different Audiences Font Styles Using a Simulated Scenario to Produce a News Report Writing for a Campaign	• Timer: In coding, use a timer command to run a block of commands after a timed delay or at regular intervals. • Variable: A named area in computer memory. A variable has a name and a value. The program can change this variable value. Variables are used in programming to keep track of things that can change while a program is running. Unit 4.2 – Online Safety AdFly: An online advertising marketplace that allows publishers to monetize their website traffic by placing advertisements on their site. • Attachment: A file, which could be a piece of work or a picture, that is sent with an email. • Citation: Making reference to the original source of a piece of information quotation or image.	• To explore how font size and style can affect the impact of a text. • To use a simulated scenario to produce a news report. • To use a simulated scenario to write for a community campaign.	• Children can look a and discuss a variety of written material where the font size and type are tailored to the purpose of the text. • Children can use text formatting to make a piece of writing fit for its audience and purpose. • Children can role-play the job of a journalist in a newsroom. • Children can interpret a variety of incoming communications and use these to build up the details of a story. • Children can use the incoming information to write their own newspaper report. • Children can use 2Connect to mind-map ideas for a community campaign. • Children can use these ideas to write a persuasive letter or poster as part of the campaign. • Children can assess their texts using criteria to judge their suitability for the intended audience.
Unit 4.5 – Logo Introduction to 2Logo Creating Letter using 2Logo Using the '\Repeat' Command in 2Logo	• Collaborate: To work jointly on an activity or project. • Collaborative database: A collaborative database allows more than one person to access and input data on the database. • Cookies: A small amount of data generated by a website and saved by a web	• To learn the structure of the language of 2Logo • To input simple instructions in 2Logo • To use 2Logo to create letter shapes. • To use the Repeat command in 2Logo to create shapes.	• Children know what the common instructions are in 2Logo and hot to type them. • Children can follow simple 2Logo instructions to create shapes on paper. • Children can follow simple instructions to create shapes in 2Logo.

Using Procedures	browser. Its purpose is to remember information about the user. • Copyright: When the rights to something belong to a specific person. • Data analysis: The process of interpreting and understanding data that has been collected and organised. • Digital footprint: The information about a person that exists on the Internet as a result of their online activity. • Malware: Software that is specifically designed to disrupt, damage, or gain unauthorized access to a computer system. • Phishing: Practice of sending email pretending to be from reputable companies in order to persuade individuals to reveal personal information, such as passwords and credit cards numbers. • Plagiarism: Taking someone else's work or ideas and passing them off as one's own. • Ransomware: A type of malicious software designed to block access to a computer system until a sum of money is paid. • Report: If content or contact online worries someone, they should report it to a trusted adult such as a teacher or parent. • SMART rules: A set of rules based around the word SMART designed to help you stay safe when online. SMART represents the words Safe, Meet, Accept, Reliable, Tell. • Software: The programs and other operating information used by a computer. • Spam: Messages sent over the Internet, typically to many users, for the purposes of advertising, phishing or spreading malware. Virus: A piece of code which can copy itself and typically has a damaging effect on the device, such as corrupting the system or destroying data. • Watermark: Watermarks are used mainly on images or videos to show who the content belongs to. Unit 4.3 – Spreadsheets Average: A number expressing the typical value in a set of data. Also known as the mean. It is calculated by dividing the sum of the values in the set by their number. • Budget: The amount of money available to spend on a project. • Calculations: The process or result of adding, subtracting, multiplying, or dividing or a combination of these operations. • Chart: A diagram that represents data. Charts include graphs and other diagrams such as pie charts or flowcharts. • Column: Boxes running vertically in a spreadsheet.	• To use and build procedures in 2Logo.	• Children can create 2Logo instructions to draw patterns of increasing complexity. • Children understand the pu and pd commands. • Children can write 2Logo instructions for a word of four letters. • Children can follow 2Logo code to predict the outcome. • Children can create shapes using the Repeat command. • Children can find the most efficient way to draw shapes. • Children can use the Procedure feature. • Children can create 'flowers' or 'crystals' using 2Logo.
Unit 4.6 – Animation Animating an Object 2Animate Tools Stop Motion Animation		• To decide what makes a good, animated film or cartoon and discuss favourite animations. • To learn how animations are created by hand. • To find out how 2Animate animations can be created in a similar way using technology. • To learn about onion skinning in animation. • To add backgrounds and sounds to animations. • Introducing 'stop motion' animation. • To share animation the class blog.	• Children have put together a simple animation using paper to create a flick book. • Children understand animation frames. • Children have made a simple animation using 2Animate. • Children know what the Onion Skin tool does in animation. • Children can use the Onion Skin tool to create an animated image. • Children can use backgrounds and sounds to make more complex and imaginative animations. • Children know what 'stop motion' animation is and how it is created. • Children have used ideas from existing 'stop motion' films to recreate their own animation. • Children have shared their animations and commented on each other's work using display boards and blogs in Purple Mash.
Unit 4.7 – Effective Searching Using a Search Engine Use Search Effectively to Answer Questions Reliable Information Sources		• To locate information on the search results page. • To use search effectively to find out information. • To assess whether an information source is true and reliable.	• Children can structure search queries to locate specific information. • Children have used search to answer a series of questions. • Children have written search questions for a friend to solve. • Children can analyse the contents of a web page for clues about the credibility of the information.
Unit 4.8 – Hardware Investigators Hardware Parts of a Computer		• To understand the different parts that make up a desktop computer • To recall the different parts that make up a computer.	• Children can name the different parts of a desktop computer. • Children know what the functions of the different parts of a computer is. • Children have created a leaflet to show the function of computer parts.
Unit 4.9 – Making Music Understanding Music Rhythm and Tempo Melody and Pitch Creating Music		• To identify and discuss the main elements of music: Pulse, Rhythm, Tempo, Pitch, Texture • To understand and experiment with rhythm and tempo. • To create a melodic phrase. • To compose a piece of electronic music.	• Children can use appropriate musical language to discuss a piece of music. • Children can identify sounds in a piece of music. • Children can explain how a piece of music makes them feel. • Children can identify and recall a simple rhythm. • Children can explain what tempo is, and how changing it can change the mood of apiece of music.

• Data: A collection of information, especially facts or numbers, obtained by
observation, questions or measurement to be analysed and used to help
decision-making.
• Decimal place: The position of a digit to the right of a decimal point. In 2Calculate,
the number of decimal places to be displayed can be chosen.
• Equals to tool: This shows if an answer to a calculation is correct or not.
• Format Cell: The way that data is displayed in a cell. For example, using units
such as £ or $.
• Formula: A group of letters, numbers, or other symbols which represents a
scientific or mathematical rule. The plural of formula is formulae.
• Formula Wizard: The formula wizard helps a user create formulas which
perform calculations on selected cells. For example, adding, multiplying,
average, total.
• Line graph: A line graph is used to display information which can change over
time. For example, temperature at different times of the day.
• Percentage: 'per' 'cent' means number of parts per hundred.
• Place value: This is the value of each digit within a number. For example 354,
the 3 = 3 hundreds, the 5 = 5 tens and the 3 = 3 ones.
• Random number tool: This tool, when clicked, will generate a random
number.
• Resize: This is used to reduce or increase the size of a sheet in 2Calculate.
• Row: Boxes running horizontally in a spreadsheet.
• Set image: Images in 2Calculate can be given a value. For example, an apple
1 a pear 2 etc.
Spinner tool: This tool changes a number to the right of it by one each time an arrow is pressed.
• Timer: This tool counts in seconds. If a number is placed to the right of it, it will increase it by 1 each second.
• Totals: This tool will total anything in the cells below, next to or diagonal to it.

Unit 4.4 – Writing for different audiences

Campaign: An organised course of action to achieve a goal.
• Format: The way in which something is arranged or set out.
• Font: A set of type which shows words and numbers in a particular style and
size.
• Genre: The style or category type of a piece of art, music or writing.
• Opinion: A view or judgment someone forms about something, not always
based on fact.

- Children can create their own simple rhythm using Busy Beats.
- Children can show an understanding of melody.
- Children can create a simple melodic pattern using 2Sequence and Busy Beats.
- Children can use a variety of notes, experimenting with pitch.
- Children can explore and understand how music is created.
- Children can experiment with pitch, rhythm and melody to create a piece of house music on Busy Beats.

| | • Reporter: A person who reports news or conducts interviews for the press or broadcasting media.
• Viewpoint: The way someone sees or thinks about something.

Unit 4.5 – Logo

Debugging: The process of identifying and removing errors from computer hardware or software.
• Grid: The template around which the 2Logo turtle moves.
• Logo: A text-based coding language used to control an on-screen turtle to create mathematical patterns.
• Logo Commands (e.g. FD, BK, RT, LT) : A list of commands inputted into 2Logo to move the turtle around the screen.
• Multi Line Mode: Type several lines of commands in the text area.
• Pen Down: Lowers the screen pen so the 2Logo turtle draws a line on the screen.
• Pen Up: Raises the screen pen so the 2Logo turtle doesn't draw on screen.
• Prediction: When you say what is going to happen when you run the instructions.
• Procedure: Pieces of Logo text with a procedure name that can be run by calling them by name. Saves time if you want to print to screen lots of the same shape.
• Repeat: A set of instructions that is run a specified number of times.
• Run Speed: The speed at which the 2Logo turtle moves around the screen.
• SETPC: Set pen colour to a given colour.
• SETPS: Set the thickness of the pen's line.

Unit 4.6 – Animation

Animation: The process of adding movement to still objects.
• FPS (Frame Per Second): The number of frames played per second.
• Frame: A single image in an animation.
• Onion skinning: A process where the shadow image of the previous frame is present to help you line up the objects of the animation correctly.
• Pause: To temporarily stop the animation.
• Stop motion: A technique whereby the camera is repeatedly stopped and started, for example to give animated figures the impression of movement.

Unit 4.7 – Effective searching
Balanced view: Presenting opposing points of view fairly and without bias. | | |

• Easter eggs: An unexpected or undocumented feature in a piece of computer
software or on a DVD, included as a joke or a bonus.
• Internet: A global computer network providing a variety of information and
communication facilities.
• Key words: A word or a group of words an Internet user uses to perform a
search in a search engine.
• Reliability: The degree to which the result of something can be depended on
to be accurate.
• Results page: Where the answers to a search are displayed.
• Search engine: A program that searches for and identifies items in a
database. Used especially for finding sites on the World Wide Web.

Unit 4.8 – Hardware investigators

Components: Parts inside the computer casing.
• CPU: The 'brains' of the computer, where all the calculations take place.
• Graphics Card: Also known as a video card and used for displaying images.
• Hard Drive: Where the computer stores all your documents, pictures, games
and videos.
• Hardware: The physical parts of a computer or device.
• Input: How information enters the computer.
• Motherboard: Main printed circuit board of the computer.
• Network Card: Used to connect the computer to a network such as the
Internet.
• Output: Where information leaves the system.
• Peripherals: Parts that are attached to the computer case.
• RAM: Allows programs to store information to help the computer run quickly.
• Software: The programs that run on the computer.

Unit 4.9 – Making Music

BPM: Beats per Minute. Changing the BPM changes the speed of the music.
• Dynamics: How loud or quiet a sound is.
• Harmonious: Notes which sound tuneful and pleasant together.
• Melody: A sequence of notes which make up a tune.
• Pitch: How high or low a sound is.
• Pulse: The steady beat of a piece of music.
• Rhythm: A pattern of long and short sounds and silences.
• Tempo: How slow or fast a piece of music is.
• Texture: The different sounds you can hear in a piece of music.
• Synths: Short for synthesizer. Electronic musical instrument sounds.