Computing - End Points Planning Document

Our Vision: To be able to use technology to enrich their life and the lives of others. Be equipped with skills to create new and interesting programs, systems and models to improve outcomes for everyone.			
National Curriculum Objectives Substantive Knowledge EYFS ELGs	Disciplinary Knowledge: Progressive skills	Disciplinary Knowledge: Progressive skills	Progressive vocabulary (recorded in red and black) and Resources (recorded in red)
	Progressive skills may be used to support End Points. This will depend on cohort and class needs	End Points are our objectives that all children will work towards to achieve subject outcomes.	
Year R			
Personal, Social and Emotional Development Use voice recording equipment to discuss feelings and relationships **Physical Development** Use a range of input devices, including the keyboard and mouse to develop the required fine motor skills. **Understanding the World** Use control technology within topics being taught Explore and use a range of technology devices within continuous provision **Expressive Arts and Design** Use paint and graphics applications to design and create pictures, cards and other projects	Children are given opportunities to become familiar with a range of input devices, including the keyboard and mouse, in order to develop the required fine motor skills. Children have opportunities for exploration with a range of working and non-functioning technology devices where they can select and use technology for a particular purpose. Children will have an understanding of how they can stay safe online.	Can I use paint and graphic software for projects? Can I learn about e-safety? Can I use control technology? Can I control and complete games? Can I use a range of devices (e.g. cameras, remote control devices, walkie talkies)? Can I use the internet for online learning?	**Smartie the Penguin Story A and B for EYFS:** **https://www.childnet.com/resources/smartie-the-penguin/** **Digiduck Stories** **https://www.childnet.com/resources/digiduck-stories/** **computer, mouse, keyboard, paint, safety, camera, graphics, screen,** **Camera, computer, Beebot, walkie talkie**
Year 1			
PROGRAMMING	Can I understand what an instruction is?	**Can I predict the outcome of a command on a device?**	instruction, command, sequence, order, programmable, computer, series, control

• 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	Can I say a simple set of instructions that make something happen? Can I sequence a simple set of instructions that make something happen?	**Can I run a command on a floor robot?** **Can I choose a command for a given purpose?** **Can I combine commands in a program?** **Can I run a program on a device?**	**Beebots, Scratch**
DATA AND INFORMATION • 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	Can I identify that objects can be counted? Can I recognise that information can be presented and in different ways?	**Can I collect simple data?** **Can I show that collected data can be counted?** **Can I choose an attribute to group objects by?** **Can I group objects to answer questions?** **Can I describe a group of objects?**	data, attribute, group, present, count
CREATING MEDIA • 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	Y1 PROGRESSIVE SKILLS Can I explain what different freehand tools do? Can I recognise that computers can be used to create art? Can I decide when it's appropriate to use each tool? Can I compare painting with painting using brushes? Can I recognise that a keyboard is used to enter text into a computer? Can I recognise that the Shift key changes the output of a key? Can I recognise that text can be changed?	**Can I create a picture using freehand tools?** **Can I use shape and line tools when precision is needed?** **Can I use the fill tool to colour and enclosed area?** **Can I use the undo button to correct a mistake?** **Can I combine a range of tools to create a piece of artwork?** **Can I use a keyboard to enter text into a computer?** **Can I use punctuation and special characters?** **Can I select and change text?**	tool, freehand, shape, line, fill, undo, document, file, folder, save, open, load, find, record, navigate, website, internet, click, sound, photograph, camera **A variety of different IT devices including laptops/iPads.**

COMPUTER SYSTEMS AND NETWORKING • 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 • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact	Can I identify examples of technology? Can I recognise that a computer is an example of technology? Can I recognise that choices are made when using technology? Can I explain why rules are needed when using technology?	**Can I recognise that same technology can be used in different ways?** **Can I identify the main parts of a computer?** **Can I use a mouse and keyboard?** **Can I show how to use technology safely?**	IT, computing, devices, technology, connect, school, home
Year 2			
PROGRAMMING • 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	Can I explain what happens when we change the order of instructions? Can I use logical reasoning to predict the outcome of a program? Can I create a program? Can I debug a program that I have written?	**Can I create a program?** **Can I trace a sequence to make a prediction?** **Can I run a program on a device?** **Can I test a prediction by running the sequence?** **Can I debug a program that I have written?**	instruction, command, sequence, order, programmable, computer, series, control, digital, algorithm, program, precise, test, angle, turn, direction, device, execute, device, debug **Scratch (Laptops/iPads), Beebots**

DATA AND INFORMATION • 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	Can I use a tally chart to collect data? Can I compare objects that have been grouped by attributes? Can I construct a comparison question? Can I suggest appropriate headings for tally charts and pictograms? Can I explain that we can present information using a computer? Can I use a computer program to present information in different ways? Can I give examples of why some information should not be shared?	**Can I input data on to a computer?** **Can I use pictograms to answer single-attribute questions?** **Can I use a computer to view data in different formats?** **Can I use a computer to answer comparison questions?**	data, attribute, group, present, count, pictogram, graph, comparison
CREATING MEDIA • 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	Can I talk about how to take a photograph? Can I make choices when composing my photograph? Can I recognise features of 'good' photographs? Can I identify how a photograph could be improved? Can I recognise that photographs can be changed after they have been taken? Can I recognise that some images are not accurate? Can I identify that computers can be used to play sounds of different instruments? Can I identify that the same pattern can be represented in different ways? Can I compare playing music on instruments with making music on a computer?	**Can I capture a digital image?** **Can I decide which photographs to keep?** **Can I use zoom to change the composition of a photograph?** **Can I improve a photograph by retaking it?** **Can I use filters to edit the appearance of a photograph?** **Can I experiment with different sounds on a computer?** **Can I experiment with musical patterns on a computer?** **Can I use a computer to create a musical pattern?** **Can I use a computer to play the same music in different ways?**	tool, freehand, shape, line, fill, undo, document, file, folder, save, open, load, find, record, navigate, website, internet, click, sound, photograph, camera, keys, space, backspace, text, cursor, shift, special characters, document, file, folder, save, open, load, filter, composition, light, zoom, landscape, portrait
COMPUTER SYSTEMS AND NETWORKING • understand computer networks including the internet; how they can provide multiple services,	Can I recognise different types of computers used within school? Can I recognise the features of information technology?	**Can I describe some uses of computers?** **Can I identify information technology in and beyond school?**	IT, computing, devices, technology, connect, school, home, Email, online, forum, communication

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 and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact	Can I talk about the uses of information technology? Can I explain how information technology benefits us? Can I recognise that choices are made when using information technology?	**Can I show how to use information technology safely?**	

Year 3			
PROGRAMMING • 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	Can I explain what a sequence is? Can I identify that a program includes sequences of commands? Can I identify that the sequence of a program is the process? Can I explain that the order of commands can affect a program's output?	**Can I build a sequence of commands?** **Can I combine commands in a program?** **Can I order commands in a program?** **Can I create a sequence of commands to produce a given outcome?**	instruction, command, sequence, order, programmable, computer, series, control, digital, algorithm, program, precise, test, angle, turn, direction, device, execute, debug, error, fix, improve, change, predict, rotation, angle, input, output, geometric, line, degrees, **Scratch (Laptops/iPads)** https://hourofcode.com/uk/learn
DATA AND INFORMATION • 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,	Can I investigate questions with yes/no answers? Can I identify attributes that you can ask yes/no questions about? Can I explain that a branching database is an identification tool?	**Can I create questions with yes/no answers?** **Can I choose questions that will divide objects into evenly sized subgroups?** **Can I identify an object using a branching database?**	data, attribute, group, present, count, pictogram, graph, comparison, branch, yes/no, identify **Laptops/iPad**

systems and content that accomplish given goals	Can I recognise that a data set can be structured using yes/no questions? Can I suggest real-world applications for branching databases?	**Can I retrieve information from different levels of the branching database?**	
CREATING MEDIA • 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	Can I plan explain that an animation is made up of a sequence of images? Can I recognise that smaller movements create smoother animation? Can I explain the impact of adding other media to an animation? Can I recognise how text and images can be used together to convey information? Can I consider how different layouts can suit different purposes? Can I recognise that DTP pages can be structured with placeholders? Can I consider the benefits of using a DTP application?	**Can I plan an animation using a storyboard?** **Can I capture an image and move a subject between captures?** **Can I review a captured sequence of frames as an animation?** **Can I remove frames to improve an animation?** **Can I add media to enhance an animation?** **Can I organize text and image placeholders in a page layout?** **Can I add, remove and edit images within a placeholder?** **Can I add and edit text within a placeholder?** **Can I choose fonts and apply effects to text?** **Can I review a document?**	tool, freehand, shape, line, fill, undo, document, file, folder, save, open, load, find, record, navigate, website, internet, click, sound, photograph, camera, keys, space, backspace, text, cursor, shift, special characters, document, file, folder, save, open, load, filter, composition, light, zoom, landscape, portrait, enhance, edit, improve, caption, manipulate, sound, audio, waveform, volume, layer, input, output, microphone, speaker **Laptops/iPads, camera**
COMPUTER SYSTEMS AND NETWORKING • 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 • Use technology safely, respectfully and responsibly;	Can I describe what an input is? Can I explain that an output is produced by the process? Can I recognise that computers can be connected to each other? Can I explain how computer systems can change the way that we work? Can I recognise that a network is made up of a number of components? Can I identify the benefits of computer networks?	**Can I identify input and output devices?** **Can I explain how a computer system accepts an input and processes it to produce an output?** **Can I explain how a computer network can be used to share information?** **Can I identify network devices around me?** **Can I explain how networks can be connected to other networks?**	IT, computing, devices, technology, connect, school, home, Email, online, forum, communication, search engine, network, media, navigate, input, process, output

recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact			
Year 4			
PROGRAMMING • 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	Can I explain that we can use a loop command in a program to repeat instructions? Can I identify a loop within a program? Can I explain that there are indefinite loops and count-controlled loops? Can I justify when to use a loop and when not to? Can I explain the importance of instruction order in a loop?	**Can I use an indefinite loop to produce a given outcome?** **Can I use a count-controlled loop to produce a given outcome?** **Can I plan a program that includes appropriate loops to produce a given outcome?** **Can I create two or more sequences that run at the same time?**	instruction, command, sequence, order, programmable, computer, series, control, digital, algorithm, program, precise, test, angle, turn, direction, device, execute, debug, error, fix, improve, change, predict, rotation, angle, input, output, geometric, line, degrees, loop, infinite, count-controlled **Scratch**
DATA AND INFORMATION • 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	Can I suggest questions that can be answered using a table of data? Can I identify data that can be logged over time? Can I recognise that a sensor can be used as an input device for data collection? Can I explain that a data logger captures 'data points' from sensors over time?	**Can I use a digital device to collect data automatically?** **Can I choose how often to automatically collect data from samples?** **Can I use a set of logged data to find information?** **Can I use a computer program to sort data by one attribute?** **Can I export information in different formats?**	data, attribute, group, present, count, pictogram, graph, comparison, branch, yes/no, identify, logging, sensor, data point **Data Loggers**
CREATING MEDIA • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and	Can I identify that sound can be recorded? Can I identify that an input is needed to record audio, and an output required to play audio?	**Can I record sound using a computer?** **Can I play recorded audio?** **Can I delete a section of audio?**	tool, freehand, shape, line, fill, undo, document, file, folder, save, open, load, find, record, navigate, website, internet, click, sound, photograph, camera, keys, space, backspace, text, cursor, shift, special characters, document, file, folder, save, open, load, filter,

create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information	Can I recognise that audio can be edited? Can I recognise that audio can be layered so that multiple sounds can be played at the same time? Can I use an application to change the whole of a digital image? Can I change the composition of a digital image? Can I use an application to add to the composition of a digital image?	**Can I change the volume of tracks in a project?** **Can I consider the results of editing choices made?** **Can I recognise that digital images can be changed for different purposes?** **Can I choose the most appropriate tool for a particular purpose?** **Can I consider the impact of changes made on the quality of the image?**	composition, light, zoom, landscape, portrait, enhance, edit, improve, caption, manipulate, sound, audio, waveform, volume, layer, input, output, microphone, speaker, podcast, audio, sound, layer, iPads
COMPUTER SYSTEMS AND NETWORKING • 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 • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact	Can I outline how information can be shared via the World Wide Web? Can I recognise the need for security on the internet? Can I describe the types of content/media that can be added, created and shared on the World Wide Web?	**Can I explain that the World Wide Web comprises of websites and web pages?** **Can I describe how to access the World Wide Web?** **Can I evaluate the reliability of content and the consequences of unreliable content?** **Can I explain the benefits of the World Wide Web?**	IT, computing, devices, technology, connect, school, home, Email, online, forum, communication, search engine, network, media, navigate, collaborate, hyperlink, multiple
Year 5			
PROGRAMMING • Design, write and debug programs that accomplish specific goals, including controlling or	Can I use external triggers and infinite loops to control sprites? Can I explain the term variables? Can I edit and add variables to a program?	**Can I combine sequences of instructions and procedures to turn devices on and off?** **Can I use technology to control an external device?**	instruction, command, sequence, order, programmable, computer, series, control, controller, digital, algorithm, program, precise, test, angle, turn, direction, device, execute, debug, error, fix, improve, change, predict, rotation, angle, input, output, geometric, line, degrees, variables, prediction, accurate, debug, conditional,

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	Can I use conditional statements (e.g., 'when'…, 'if…then')? Can I use loops and conditions to refine algorithms? Can I use 'Sensing' to add detail to my program? Can I use external inputs to control external outputs?	**Can I design algorithms that use repetition and 2-way selection (if/else statements)?** **Can I test and debug a program that I have created?**	sprite, evaluate, loops, condition-controlled loop, external, internal, triggers, repetition, combine, if, else, selection, condition **Crumble Microcontrollers, Scratch (Laptops/iPads)**
DATA AND INFORMATION • 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	Can I explain ways that a computer program can organise data? Can I use 'AND' and 'OR' to refine data selection? Can I explain that computer programs can be used to compare data visually? Can I show how to present information to communicate a message?	**Can I choose different ways to view data?** **Can I ask questions that need more than one attribute to answer?** **Can I choose multiple criteria to search data to answer a given question (AND/OR)?** **Can I choose suitable ways to present information to other people?**	data, attribute, group, present, count, pictogram, graph, comparison, branch, yes/no, identify, logging, sensor, data point, attribute, sort, filter **Laptops/iPads**
CREATING MEDIA • 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	Can I identify that a vector drawing comprises separate objects? Can I add, select, duplicate and modify objects in a vector drawing? Can I recognise that objects can be modified in groups? Can I present information creatively? Can I trim, arrange and edit audio levels of video to improve the quality of the outcome?	**Can I manipulate objects in a vector drawing?** **Can I combine options to achieve a desired effect?** **Can I create a vector drawing for a given purpose?** **Can I analyse information?** **Can I evaluate information?** **Can I edit a movie?**	tool, freehand, shape, line, fill, undo, document, file, folder, save, open, load, find, record, navigate, website, internet, click, sound, photograph, camera, keys, space, backspace, text, cursor, shift, special characters, document, file, folder, save, open, load, filter, composition, light, zoom, landscape, portrait, enhance, edit, improve, caption, manipulate, sound, audio, waveform, volume, layer, input, output, microphone, speaker, podcast, audio, sound, layer, multimedia, presentation, movie, analyse, evaluate, trim **iPads/Laptops**
COMPUTER SYSTEMS AND NETWORKING • understand computer networks including the internet; how they can provide multiple services, such as the world wide web;	Can I use search technologies effectively? Can I evaluate digital content? Can I explain how results are selected and ranked?	**Can I competently use the internet as a search tool?** **Can I demonstrate that different search terms produce different results?**	IT, computing, devices, technology, connect, school, home, Email, online, forum, communication, search engine, network, media, navigate, collaborate, hyperlink, multiple, evaluate, ranked, validity, function, reference, system

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 and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact	Can I use advanced search functions in Google, e.g. quotations? Can I understand the validity of some websites, especially those that are made by users (Wikipedia - link to E-Safety)?	**Can I evaluate the results of search terms?** **Can I understand how search results are selected and ranked?**	

Year 6			
PROGRAMMING • 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	Can I evaluate analytically to solve problems by breaking them in to parts? Can I find the most efficient solution to a problem with my algorithm? Can I use conditional statements and variables to make something happen in my program? Can I use loops and conditions to refine my algorithms? Can I evaluate the effectiveness of my program and debug if required? Can I predict what will happen if…? Can I combine procedures?	**Can I design a solution by breaking a problem up?** **Can I recognise that different solutions can exist for the same problem?** **Can I use logical reasoning to detect errors in algorithms?** **Can I use selection in programs?** **Can I work with variables?** **Can I explain how an algorithm works?** **Can I explore 'what if' questions by planning different scenarios for controlled devices?** **Can I design, test and debug my projects?**	instruction, command, sequence, order, programmable, computer, series, control, controller, digital, algorithm, program, precise, test, angle, turn, direction, device, execute, debug, error, fix, improve, change, predict, rotation, angle, input, output, geometric, line, degrees, variables, prediction, accurate, de-bug, conditional, sprite, evaluate, loops, sensor, external, internal, triggers, repetition, combine, if, else, selection, condition, what if, predict, refine, efficient, problem, effective **Micro:Bits, laptops, Scratch**
DATA AND INFORMATION • 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,	Can I explain what an item of data is in a spreadsheet? Can I explain how data type determines how a spreadsheet can process the data?	**Can I calculate data using a formula for each operation?** **Can I use functions to create new data?** **Can I use existing cells within a formula?**	data, attribute, group, present, count, pictogram, graph, comparison, branch, yes/no, identify, logging, sensor, data point, attribute, sort, filter, spreadsheet, formula, function, cell, operation

systems and content that accomplish given goals	Can I explain how formulas can be used to produce calculated data? Can I explain why data should be organised in a spreadsheet?	**Can I choose suitable ways to present spreadsheet data?**	
CREATING MEDIA • 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	Can I explain that 3D models can be created on a computer? Can I recognize that a 3D environment can be viewed from different perspectives? Can I recognize that digital tools can be used to manipulate 3D objects? Can I recognize that artefacts can be broken down into a collection of 3D objects? Can I recognize that websites contain different media types? Can I recognize that a website is a set of hyperlinked web pages? Can I recognize the need for a navigation path?	**Can I position 3D shapes relative to one another? Can I use digital tools to modify 3D objects? Can I combine objects to create a 3D digital artefact? Can I construct a 3D model which reflects a real-world object?** **Can I create a new blank web page? Can I add text and embed media in a web page? Can I insert hyperlinks between pages and to other sites?**	tool, freehand, shape, line, fill, undo, document, file, folder, save, open, load, find, record, navigate, website, internet, click, sound, photograph, camera, keys, space, backspace, text, cursor, shift, special characters, document, file, folder, save, open, load, filter, composition, light, zoom, landscape, portrait, enhance, edit, improve, caption, manipulate, sound, audio, waveform, volume, layer, input, output, microphone, speaker, podcast, audio, sound, layer, multimedia, presentation, movie, analyse, evaluate, trim, perspective, artefact, model, CAD (computer-aided design), website, media, webpage **TinkerCAD, laptops.**
COMPUTER SYSTEMS AND NETWORKING • 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 • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact	Can I discuss opportunities that technology offers for communication and collaboration? Can I explain which types of media can be shared through the internet? Can I explain that communicating and collaboration using the internet can be public or private?	**Can I outline methods of communicating and collaborating using the internet? Can I evaluate different methods of online communication and collaboration? Can I decide what I should and should not share online?**	IT, computing, devices, technology, connect, school, home, Email, online, forum, communication, search engine, network, media, navigate, collaborate, hyperlink, multiple, evaluate, ranked, validity, function, reference, system domain, reliability, validation, extensions