Computing curriculum overview and progression of skills/knowledge

EYFS/KS1	Autumn	Spring	Summer
EYFS			
		PSED Safer Internet Day – keeping safe online, stranger danger Exploring sensible amounts of 'screen time' **Literacy** Digital Literacy - Looking at how information can also be found from the computers. – Children will be taught the parts of a computer (monitor, mouse, keyboard) and the purpose of using a computer. – begin to develop the skills are logging on and off. **Understanding of the World** **Computing** – how to log on and log off; parts of a computer, purpose of internet Bee-bots – programming and coding Computer, internet, research	**Understanding of the Wold** **Computing** – purple mash and espresso. Video, program, • Can children recognise that a range of technology is used in places such as homes and schools? • Can they select and use technology for particular purposes?
	Continuous provision – Technology items available in role play areas (cash till, torch)		

Year 1			
	NC objectives 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. **Key Skills and knowledge** **Information Technology** I can complete a simple task on a computer or tablet by following instructions. I know I need to save my work. I can load my digital work (with some help) I can enter text in to my work. I understand that you can enter numbers in to a computer (e.g. to create a pictogram). Digital literacy, introducing children to aspects of computing such as manipulating data, using the computer safely and launching applications. Logging on independently; Numbots; Spelling Shed; Mathletics; Purple Mash; Education City; 2type; 2paint; 2simple. **Keeping Safe** I know some basic internet safety rules. I can follow the school's safer internet rules. I can use passwords for TT Rockstars, Mathletics, Spelling Shed etc. I know that personal information should not be shared online. I can use a password to access a secure network. I know I must tell a trusted adult if anyone tries to talk to me online. Online bullying (Anti-bullying Week).	**NC objectives** Use technology purposefully to create, organise, store, manipulate and retrieve digital content. 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. **Key Skills and knowledge** **Information Technology** I can complete a simple task on a computer or tablet by following instructions I know I need to save my work I can load my digital work (with some help) I can enter text in to my work I understand that you can enter numbers in to a computer (e.g. to create a pictogram) Organise, store, retrieve & manipulate data. • Can they understand the appropriate vocabulary according to equipment available? • Can they develop awareness and use of keyboard layout and use navigation skills appropriately (e.g. backspace, enter, spacebar, mouse)? **Digital Literacy** I can find different types of information from different sources. I can recognise digital technology used in everyday life. I can start to understand that some work is online (internet based) and some offline. Recognise uses of IT outside of school • Do they recognise the different forms of digital communication (e.g., emails address, twitter handle etc)? **Keeping Safe** I know some basic internet safety rules. I can follow the school's safer internet rules.	**C objectives** Use technology purposefully to create, organise, store, manipulate and retrieve digital content. 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. Use logical reasoning to predict the behaviour of simple programs. **Key Skills and knowledge** **Computer Science** I understand and follow instructions to make something happen so it works. I can control the movement of a character using single commands (e.g. forward or turn). I can control the movement of a character using MORE THAN ONE command (forward then turn) to make it work well. Understand use of algorithms and coding. Write & test simple programs. **Keeping Safe** I know some basic internet safety rules. I can follow the school's safer internet rules. I can use passwords for TT Rockstars, Mathletics, Spelling Shed etc. I know that personal information should not be shared online. I can use a password to access a secure network. I know I must tell a trusted adult if anyone tries to talk to me online.

		I can use passwords for TT Rockstars, Mathletics, Spelling Shed etc. I know that personal information should not be shared online. I can use a password to access a secure network. I know I must tell a trusted adult if anyone tries to talk to me online. Communicate online safely and respectfully	

Year 2			
	NC objectives - Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. - Use logical reasoning to predict the behaviour of simple programs. **Key skills and knowledge** *Computer Science* - Predicting outcomes of coding - Repeated instructions to gain desired outcome - Code right angle turns Knowledge; Use Espresso Coding to code repeated instructions and to make things move given an instruction. *IT- Creating content, save and retrieve* - Christmas lists, London pictures (geography link), Christmas cards • Canthey experiment withdrawing tools, text, pictures and animation to create content (e.g., presentation, eBook)? • Can they create content (e.g., presentation, video, animation) in a small group and record the narration? *Digital Literacy* - *Keeping safe* - Internet safety rules	**NC objectives** - Create and debug simple programs. - Use technology purposefully to create, organise, store, manipulate and retrieve digital content. - 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. **Key skills and knowledge** *Computer Science* - Understand that an algorithm is a list of instructions that must be done in the right order. - Create a list of instructions to make things happen consistently (eg on device or App) Knowledge; Use Espresso Coding to ensure instructions are clear and can be repeated. *IT- Creating content, save and retrieve* - Save and load (retrieve) my work on a range of devices (eg laptops and tablets). - Change what is in my work and the look of my work (ie change the format) • Can they communicate safely online (e.g., reply to email, respond to tweet)? Knowledge; Use Microsoft Word to input information, save and retrieve. *Digital Literacy (link to research)* - Select appropriate buttons to navigate web sites or stored information. - Begin to understand that computers use icons, menus, hyperlinks to provide information and instructions. - I can begin to understand that not all the content on web sites is true (eg spoof websites). Knowledge; Navigate websites and copy information to Microsoft Word (link to saving and retrieving above). *Keeping safe* - Use search engine agreed by the school. - Use the internet for learning and retrieving information.	**NC objectives** - 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. **Key skills and knowledge** *Computer Science* - Understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous of instructions. Knowledge; Use the language of algorithm to describe their code in Espresso Coding. *IT - creating content, save and retrieve.* - Save and load (retrieve) my work, linked to Espresso Coding, on a range of devices (eg laptops and tablets). - Change what is in my work and the look of my work Knowledge; Change the format of the created work from last half term by changing the font, size and colour in Microsoft Word. *Digital Literacy (link to research)* - Find information on a website - Click links in a website - Print a web page to use as a resource - Experiment with text, pictures and animation to make a simple slide show - Word process a piece of text - Insert/delete a word using the mouse and arrow keys - Highlight text to change its format (B, U, I)? Knowledge; Use Microsoft PowerPoint to create a simple slideshow. Use bold, italics and underline to create headings and subheadings to slides. *Keeping safe* - Keeping safe online agenda.

	- Use of passwords for TT Rockstars, Mathletics, Spelling Shed etc. - Understand different forms of communication (emails, online forums) - Understanding pop-ups may take them away from a main site. Knowledge; Be able to log on and off using their username and password confidently. Be able to log on and off to school subscription sites such as TT Rockstars, Mathletics and Spelling Shed using their personal username and password. Understand that there are different forms of online communication.	- Know that bookmarking is a way to find safe sites again. - Know it's not always possible to copy pictures and text from protected sites. Knowledge; Use search engines to research countries related to topic. Bookmark www.netgeokids.com/uk/.	- Understand some of the dangers of the online world. - Understand that personal information should not be shared online. - Act if they find or see something inappropriate - Recognise advertising on websites and learn to ignore it. Knowledge: Know why we should never share our username and password with strangers. Know that online profiles are not a try reflection of who a person is.

Year 3/4			
Cycle A	**Digital literacy** **Information technology** **Computer science** **Algorithms and Programs** • Experiment with variables to control models. • Make turns specifying the degrees. • Make accurate predictions about the outcome of a program they have written. **Using the Internet** • Find relevant information by browsing a menu. • Search for an image, then copy and paste it into a document. • Use 'Save picture as to save an image to the computer. • Copy and paste text into a document. • Use note making skills to decide what text to copy. **Communicating** • Know the benefits of ICT to send messages and to communicate. • Use the automatic spell checker to edit spellings. Knowledge: Create code to control models in Espresso Copy, paste and save work..	**Digital literacy** **Information technology Computer science** **Algorithms and programs:** • Experiment with variables to control models • Use 90 degree and 45 degree turns • Give an onscreen robot specific directional instructions that takes them from x to y • Write more complex programs • Can they design and create content on a computer in response to a given goal, paying attention to the needs of a known audience? • Can they can give reasons for errors in programs and explain how they have corrected these? • Can they explain an algorithm using sequence, repetition and selection in their own words? **Presentation:** • Create a presentation that moves from slide to slide and is aimed at a specific audience • Combine text, images and sound and show awareness of audience • Manipulate text, underline text, centre text, change font and size and save text to a folder • Use animation • Can they manipulate sound? • Can they combine text, images and sounds and show awareness of audience? • Can they capture images using a range of devices (e.g. webcams, screen capture, scanning, visualiser and internet)? • Can they select media	**Information technology** **Data Retrieving and Organising:** • Choose images and download into a file • Copy graphics from a range of sources and paste into a desktop publishing program • Use photo editing software to crop photos and add effects **Databases:** • Sort and search a database to answer simple questions • Recognise what a spreadsheet is • Use the terms: cell, rows and columns • Enter data, highlight it and make bar charts Knowledge: Edit photos and add effects. Add data and produce bar charts.

		to download, import or export? • Can they copy graphics from a range of sources and paste into a desktop publishing program? • Can they insert media into a presentation (image, video, audio)? • Do they know how to manipulate text, underline text, centre text, change font and size and save text to afolder? • Can they create a presentation that is aimed at a specific audience? **Communicating:** • Use spell checker **Using the internet:** • Find relevant information by using a menu • Search for image then copy and paste into a document • Use 'Save picture as' to save an image to the computer • Copy and paste text into a document • Use note-making skills to decide that text to copy • Open a link to a new window Open a document/PDF and view it • Can they recognise the impact of keyword choice on search engine results (e.g., results ranked according to relevance)? • Can they evaluate content (created researched) against a given goal? Knowledge: Use coding to move objects Use PowerPoint to present text, images, animation and sound. Copy, paste and save images..	

Cycle B	**Digital literacy** **Information technology** **Computer science** **Information Technology:** ● Use email address book ● Open and send an attachment ● To appreciate the benefits of ICT to send messages and to communicate **Computer science:** ● Experiment with variables to control models ● Use 90 degree and 45 degree turns • Can they design and create content on a computer in response to a given goal, paying attention to the needs of a known audience? • Can they can give reasons for errors in programs and explain how they have corrected these? • Can they explain an algorithm using sequence, repetition and selection in their own words? **Databases:** ● Input data into a prepared database **Using the internet:** ● Use a search engine to find a specific website ● Use tabbed browsing to open 2 or more web pages at the same time Knowledge: explain how to use the internet safely. Send emails. Create a simple algorithm in Espresso Coding.	**Digital literacy** **Information technology** **Computer science** **Algorithms and Programs** ● Give an on-screen robot specific directional instructions that takes them from x to y? ● Make accurate predictions about the outcome of a program they have written. ● Use repeat instructions to draw regular shapes on screen, using commands. **Database** ● Input data into a prepared database. ● Sort and search a database to answer simple questions. ● Recognise what a spread sheet is. ● Use the terms 'cells', 'rows' and 'columns. ● Enter data, highlight it and make bar charts. **Using the Internet** ● Find relevant information by browsing a menu. ● Search for an image, then copy and paste it into a document. ● Use 'Save picture as to save an image to the computer. ● Copy and paste text into a document? Knowledge: Instructions to move objects using coding. Input data and produce bar charts. Copy, paste and save images.	**Digital literacy** **Information technology** **Computer science** **Algorithms and Programs** ● Give an on-screen robot specific directional instructions that takes them from x to y? ● Make accurate predictions about the outcome of a program they have written. ● Use repeat instructions to draw regular shapes on screen, using commands. **Database** ● Input data into a prepared database. ● Sort and search a database to answer simple questions. ● Recognise what a spread sheet is. ● Use the terms 'cells', 'rows' and 'columns. ● Enter data, highlight it and make bar charts. **Using the Internet** ● Find relevant information by browsing a menu. ● Search for an image, then copy and paste it into a document. ● Use 'Save picture as to save an image to the computer. ● Copy and paste text into a document? Knowledge: Instructions to move objects using coding. Input data and produce bar charts. Copy, paste and save images.
E-Safety – By end of LKS2	**<u>NC objectives</u>** - 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, such as the world wide web; and the opportunities they offer for communication and collaboration		

	Key Skills: • Follow the school's safer internet rules • Recognise the difference between the work of others which has been copied (plagiarism) and re-structuring and re-presenting materials in ways which are unique and new • Begin to identify when emails should not be opened and when an attachment may not be safe • Explain how to use email safely • Use different search engines **Key Knowledge and Understanding:** • Understand the need for rules to keep them safe when exchanging learning and ideas online • Recognise that information on the internet may not be accurate or reliable and may be used for bias, manipulation or persuasion • Understand that the internet contains fact, fiction and opinion and begin to distinguish between them • Use strategies to verify information, e.g. cross-checking • Understand the need for caution when using an internet search for images and what to do if they find an unsuitable image • Understand that copyright exists on most digital images, video and recorded music • Understand the need to keep personal information and passwords private • Understand that if they make personal information available online it may be seen and used by others • Respond if asked for personal information or feel unsafe about content of a message • Recognise that cyber bullying is unacceptable and will be sanctioned in line with the school's policy • Know how to report an incident of cyber bullying • Know the difference between online communication tools used in school and those used at home • Understand the need to develop an alias for some public online use • Understand that the outcome of internet searches at home may be different than at school • Do they recognise the difference between the work of others which has been copied (plagiarism) and restructuring and re-presenting materials in ways which are unique and new?

Year 5/6			
Cycle A	**Multimedia** presentation, (WWII PPT) **NC objectives** - 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 **Key skills/knowledge** ● Can they listen to streaming audio such as online radio? ● Can they download and listen to podcasts? ● Can they produce and upload a podcast? ● Can they manipulate sounds using Audacity? ● Can they select music from open sources and incorporate it into multimedia presentations? ● Can they make a home page for a website that contains links to other pages? ● Can they capture sounds, images and video? ● Can they use the word count tool to check the length of a document? ● Can they use bullets and numbering tools? ● Can they present a film for a specific audience and then adapt same film for a different audience? ● Can they create a sophisticated multimedia presentation? ● Can they confidently choose the correct page set up option when creating a document? ● Can they confidently use text formatting tools, including heading and body text? ● Can they use the 'hanging indent' tool to help format work where appropriate (e.g. a play script)? • Can they make a multimedia presentation that contains: sound; animation; video and buttons to navigate?	**Creating own film** for end of year **Movie Trailers –** creating own using software packages **NC objectives** - 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 sequence, selection, and repetition in programs; work with variables and various forms of input and output **Key skills/knowledge** ● Can they work on simple film editing? ● Can they use a range of presentation applications? ● Do they consider audience when editing a simple film? ● Do they know how to prepare and then present a simple film? ● Can they use ICT to record sounds and capture both still and video images? Computer Science (6a More Complex Variables) **Block coding** **Unit 6a Complex variables** **Discovery Education (Espresso)** **In this unit pupils learn to use variables in more complex ways, and to manipulate inputs to create useful outputs.** • Can they explain how an algorithm works? • Can they detect errors in a program and correctthem? • Can they explore 'what if' questions by planning different scenarios for controlled devices? • Can they use input from	**Rainfall** comparisons on Excel – Rivers Database/Excel – World **NC objectives** - 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 - Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts ● Can they create a formula in a spreadsheet and then check for accuracy and plausibility? ● Can they search databases for information using symbols such as = > or <? ● Can they create databases planning the fields, rows and columns? ● Can they create graphs and tables to be copied and pasted into other documents? ● Can they collect live data using data logging equipment? ● Can they identify data error, patterns and sequences? ● Can they use the formulae bar to explore mathematical scenarios? ● Can they create their own database and present information from it? Computer Science (6b object properties) **Block coding** **Unit 6b Object properties** **Discovery Education (Espresso)** **In this unit pupils learn more about how computers use property values and parameters to store information about objects.** IT DL(1 lesson) Blogging (link in social media use)

	Graphs (conversion: imperial & metric) Computer Science **Block coding** **Unit 6 starter Y6** **Discovery Education (Espresso)** **This unit gives an overview or recap of the main concepts in all previous units from 1a to 3b.** • Can they combine sequences of instructions and procedures to turn devices on or off? • Do they understand input and output? • Can they explore 'What is' questions by playing adventure or quest games? • Can they plan a solution to a problem using decomposition (e.g., developing a computer game, creating a website)? • Can they write programs that have sequences, repetitions and variables?	sensors to trigger events? (Science/DT??) • Can design, write and debug their own computer control application? IT DL(1 lesson) – Plus Internet Safety Day)	• Can they conduct a video chat with someone? elsewhere in the school or in another school? • Can they use bullets and numbering tools? • Can they use a search engine using keyword searches? • Can they compare the results of different searches? • Can they download a document and save it to the computer? • Can they decide which sections are appropriate to copy and paste from at least two web pages?
Cycle B	**Researching and producing a PowerPoint presentation using a variety of multimedia sources.** **NC objectives** - 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 sequence, selection, and repetition in programs; work with variables and various forms of input and output **Key skills and knowledge** • Can they use a search engine using keyword searches? • Can they compare the results of different searches?	Research skills Coding **NC objectives** - Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs Computer Science (5a Speed, direction and coordinates) **Block coding** • Can they explain how an algorithm works? • Can they detect errors in a program and correct them? • Can they use an ICT program to control a number of events for an external device?	Coding and gaming Film making – use of iPad and media software (reports) **NC objectives** - 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 sequence, selection, and repetition in programs; work with variables and various forms of input and output • Can they use instant messaging to communicate with class members?

	• Can they decide which sections are appropriate to copy and paste from at least two web pages? • Can they save stored information following simple lines of enquiry? • Can they download a document and save it to the computer? • Can they contribute to discussions online? • Can they use a search engine using keyword searches? • Can they use complex searches using such as '+' 'OR' "Find the phrase in inverted commas"? Key Knowledge: To know how to safely use the internet to research. To know how to use the key features of Microsoft PowerPoint. • Can they evaluate content according to its effectiveness and impact on a target audience? • Can they create a sophisticated multimedia presentation? **Coding** **Can they combine sequences of instructions and procedures to turn devices on or off?** **Do they understand input and output?** • **Can they use an ICT program to control an external device that is electrical and/or mechanical?** • **Can they use ICT to measure sound or light or temperate using sensors?** • **Can they explore 'What is' questions by playing adventure or quest games?** • **Can they write programs that have sequences and repetitions?** Key Knowledge: To understand what an algorithm is. To debug coding when there is a problem. To understand what 'if' statements are and how to use them. **Block coding** **<u>Unit 5 starter Y5</u> Discovery Education (Espresso)** IT	• Can they use ICT to measure sound, light or temperature using sensors and interpret the data? • Can they explore 'what if' questions by planning different scenarios for controlled devices? • Can they use input from sensors to trigger events? • Can they check and refine a series of instructions? **<u>Unit 5a Speed, Direction and co-ordinates</u>** **Discovery Education (Espresso)** **In this unit pupils learn how computers use numbers to represent things such as how fast things are moving, and where they are.** IT DL(1 lesson) – Plus Internet Safety Week) Multimedia project (create a video/ppt/ presentation of the local area) Key Knowledge: To know how computers use numbers to represent how fast things are moving, and where they are.	• Can they conduct a video chat with someone elsewhere in the school or in another school? Can they add special effects to alter the appearance of a graphic? (ART) Can they make an information poster using their graphics skills to good effect? (Campaign poster for RRSA) • Can they explore the menu options and experiment with images? • Can they 'save as' gif or jpeg. Wherever possible to make the file size smaller (for emailing or downloading)? Computer Science 5b Random numbers and simulations) **Block coding** **<u>Unit 5b Random numbers and simulations</u>** **Discovery Education (Espresso)** **In this unit pupils learn how computers can generate random numbers and how these can be used in simulations** Can they write programs that have sequences, repetitions and variables? IT DL(1 lesson) Blogging (link in social media use) Write a blog as Stanley? Key Knowledge: To communicate via instant messaging and video chat successfully.

	Excel – data (Science investigation) Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content (Research Greek Gods) 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 (create powerpoints and leaflets) Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts (Coding) use sequence, selection, and repetition in programs; work with variables and various forms of input and output (Coding)		

Digital Literacy (E-Safety – Focus days or assembly lessons)

NC objectives

- 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, such as the world wide web; and the opportunities they offer for communication and collaboration

Key skills and knowledge

- **Can they discuss the positive and negative impact of the use of ICT in their own lives and those of their peers and family?**
- **Do they understand the potential risk of providing personal information online?**
- **Do they recognise why people may publish content that is not accurate and understand the need to be critical evaluators of content?**
- **Do they understand that some websites and/or pop-ups have commercial interests that may affect the way the information is presented?**
- **Do they recognise the potential risks of using internet communication tools and understand how to minimise those risks (including scams and phishing)?**
- **Do they understand that some material on the internet is copyrighted and may not be copied or downloaded?**
- **Do they understand that some messages may be malicious and know how to deal with this?**
- **Do they understand that online environments have security settings, which can be altered, to protect the user?**
- **Do they understand the benefits of developing a 'nickname' for online use?**
- **Do they understand that some malicious adults may use various techniques to make contact and elicit personal information?**
- **Do they know that it is unsafe to arrange to meet unknown people online?**
- **Do they know how to report any suspicions?**
- **Do they understand they should not publish other people's pictures or tag them on the internet without permission?**
- **Do they know that content put online is extremely difficult to remove?**
- **Do they know what to do if they discover something malicious or inappropriate?**