Whole school computing progression map							
April 2022							
This document aims to give guidance on the progression of computing knowledge, skills and techniques across the year groups. It can also be used to differentiate work, and expectations, appropriately for pupils working above and below age-related expectations (particularly SEND pupils and GD pupils). Linked to the STEM Teach Computing website planning - https://teachcomputing.org/curriculum?_ga=2.98072538.457021367.1662376514-1584900849.1662376514							
	Upper Foundation Stage	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Computing systems and networks	Explore and begin to use ipads, laptops, cameras and interactive whiteboard. Talk about different kinds of technology they have at school and at home.	<u>Technology around us.</u> Develop children's understanding of technology and how it can help them. They will become more familiar with the different components of a computer by developing their keyboard and mouse skills, and also start to consider how to use technology responsibly.	<u>IT around us.</u> Explore how information technology (IT) is being used for good in our lives. With an initial focus on IT in the home, learners explore how IT benefits society in places such as shops, libraries, and hospitals. Whilst discussing the responsible use of technology, and how to make smart choices when using it.	<u>Connecting computers</u> Develop children's understanding of digital devices, focussing on inputs, processes and outputs. They will compare digital and non-digital devices. They will be introduced to computer networks, including devices that make up a network's infrastructure. Discover benefits of connecting devices in a network.	<u>The internet</u> Children apply their knowledge and understanding of networks to appreciate the internet as network of networks. They will explore access and content on the internet. Children will add, edit and evaluate online content, deciding how accurate and reliable online content it. Understanding the consequences of false information.	<u>Sharing information</u> Children develop their understanding of computer systems and how information is transferred between systems and devices. They will consider small and large-scale systems. Children explain input, output and process aspects of different real-world systems. They take part in a collaborative online project with other class members.	<u>Communication</u> Children learn about the World Wide Web as a communication tool. They learn how to find information on search engines, selecting and ranking the results. Children investigate different methods of communication and evaluate which methods of internet communication to use for particular purposes.

	• I can tell you about technology that is used at home and in school. • I can operate simple equipment. • I can use a safe part of the Internet to play and learn.	• I can recognise the ways we use technology in our classroom. • I can recognise ways that technology is used in my home and community. • I can use links to websites to find information. • I can begin to identify some of the benefits of using technology.	• I can tell you why I use technology in the classroom. • I can tell you why I use technology in my home and community. • I am starting to understand that other people have created the information I use. • I can identify benefits of using technology including finding information, creating and communicating. I can talk about the differences between the Internet and things in the physical world.	• I can save and retrieve work on the Internet, the school network or my own device. • I can talk about the parts of a computer. • I can tell you ways to communicate with others online. • I can describe the World Wide Web as the part of the Internet that contains websites. • I can use search tools to find and use an appropriate website. • I think about whether I can use images that I find online in my own work.	• I can tell you whether a resource I am using is on the Internet, the school network or my own device. • I can identify key words to use when searching safely on the World Wide Web. • I think about the reliability of information I read on the World Wide Web. • I can tell you how to check who owns photos, text and clipart. • I can create a hyperlink to a resource on the World Wide Web.	• I can describe different parts of the Internet. • I can use different online communication tools for different purposes. • I can use a search engine to find appropriate information and check its reliability. • I can recognise and evaluate different types of information I find on the World Wide Web. • I can describe the different parts of a webpage. • I can find out who the information on a webpage belongs to.	• I can tell you the Internet services I need to use for different purposes. • I can describe how information is transported on the Internet. • I can select an appropriate tool to communicate and collaborate online. • I can talk about the way search results are selected and ranked. • I can check the reliability of a website. • I can tell you about copyright and acknowledge the sources of information that I find online.
Creating media	Create their own work using the interactive whiteboard, ipads, laptops, green screen and	<u>Digital Painting</u> Explore the world of digital art and its exciting range of creative tools.	<u>Digital photography</u> Children learn to recognise that different devices	<u>Animation</u> Children use a range of techniques to create a stop-frame animation	<u>Audio editing</u> Children identify input and output devices, such as microphone and	<u>Vector drawing</u> Children start to create vector drawing, learning to use different	<u>3D modelling</u> Children develop their knowledge and understanding of using a

	cameras. Paint pictures, take photographs, create sounds and simple text.	Empower children to create their own paintings, while getting inspiration from a range of other artists. Children consider their preferences when painting with, and without, the use of digital devices. <u>Digital writing</u> Develop understanding of the various aspects of using a computer to create and change text. Children will familiarise themselves with typing on a keyboard and begin using tools to change the look of their writing, and then they will consider the differences between using a computer and writing on paper to create text.	can be used to capture photographs and will gain experience capturing, editing, and improving photos. Finally, they will use this knowledge to recognise that images they see may not be real. <u>Making music</u> Children will explore how music can make them think and feel. They will make patterns and use those patterns to make music with both percussion instruments and digital tools. They will also create different rhythms and tunes, using the movement of animals for inspiration. Finally, children will share their creations and compare creating music digitally and non-digitally.	on the ipads. They will then apply these skills to create a story based animation. Children will then add other types of media such as music and text, to their animations. <u>Desktop publishing</u> Children become familiar with the terms 'text' and 'images'. Use desktop publishing software, considering choices of font colour, size and type to edit and improve pre-made documents. They are introduced to templates, orientation and place holders. They will look at a range of page layouts evaluating their effectiveness for real life purpose.	speakers, which are required to work with sound digitally. Discuss ownership and copyright implications. Children use software to produce their own podcast including editing, opening and saving audio files. Evaluate their own work and give feedback to peers. <u>Photo editing</u> Children develop understanding of how digital images can be changed and edited. They will learn how they can be re-saved and re-used. Children will consider the impact that editing images can have, and evaluate the effectiveness of their choices.	drawing tools to create images. Children recognise that vector drawings are created using shapes and lines. They layer objects and begin grouping and duplicating them to create more complex pieces of work. 'Google drawings' app. <u>Video editing</u> Children learn to create short videos in groups. They develop skills of capturing, editing and manipulating video. Children take their ideas from conception to completion. Green screen could be incorporated into this unit. Children have opportunities to reflect on and assess their abilities to create videos.	computer to produce 3D models. They familiarise themselves with working in a 3D space – moving, resizing and duplicating objects. Children create hollow objects using placeholders and combine multiple objects. They examine the benefits of grouping and ungrouping of 3D objects. Plan, develop and evaluate their own 3D model. <u>Web page creation</u> Children are introduced to the creation of websites for chosen purposes. They identify what makes a good site and use this to design and evaluate their own website using 'Google Sites'.

	• I can move objects on a screen. • I can create shapes and text on a screen. • I can use technology to show my learning.	• I can be creative with different technology tools. • I can use technology to create and present my ideas. • I can use the keyboard or a word bank on my device to enter text. • I can save information in a special place and retrieve it again.	• I can use technology to organise and present my ideas in different ways. • I can use the keyboard on my device to add, delete and space text for others to read. • I can tell you about an online tool that will help me to share my ideas with other people. • I can save and open files on the device I use. • I talk about the different ways I use technology to collect information, including a camera, microscope or sound recorder.	• I can create different effects with different technology tools. • I can combine a mixture of text, graphics and sound to share my ideas and learning. • I can use appropriate keyboard commands to amend text on my device, including making use of a spellchecker. • I can evaluate my work and improve its effectiveness. • I can use an appropriate tool to share my work online.	• I can use photos, video and sound to create an atmosphere when presenting to different audiences. • I am confident to explore new media to extend what I can achieve. • I can change the appearance of text to increase its effectiveness. • I can create, modify and present documents for a particular purpose. • I can use a keyboard confidently and make use of a spellchecker to write and review my work. • I can use an appropriate tool to share my work	• I can use text, photo, sound and video editing tools to refine my work. • I can use the skills I have already developed to create content using unfamiliar technology. • I can select, use and combine the appropriate technology tools to create effects that will have an impact on others. • I can select an appropriate online or offline tool to create and share ideas. • I can review and improve my own work and support others to improve their work.	• I can talk about audience, atmosphere and structure when planning a particular outcome. • I can confidently identify the potential of unfamiliar technology to increase my creativity. • I can combine a range of media, recognising the contribution of each to achieve a particular outcome. • I can tell you why I select a particular online tool for a specific purpose. • I can be digitally discerning when evaluating the effectiveness of my own work and the work of others.

					and collaborate online. • I can give constructive feedback to my friends to help them improve their work and refine my own work.		
Data and information	Explore and create photos, videos, simple text and sounds using the ipads, laptops, green screen and cameras.	<u>Grouping data</u> An introduction to data and information**.** Children will begin by using labels to put objects into groups, and labelling these groups. They will then begin to demonstrate their ability to sort objects into different groups, based on the properties they choose. Finally, children will use their ability to sort objects into different groups to answer questions about data.	<u>Pictograms</u> An introduction to the term 'data'. Children will begin to understand what data means and how this can be collected in the form of a tally chart. They will learn the term 'attribute' and use this to help them organise data. They will then progress onto presenting data in the form of pictograms and finally block diagrams. Children will use the data presented to answer questions.	<u>Branching databases</u> Children develop their understanding of what a branching database is and how to create one. They will use yes / no questions to sort groups of objects. Children create physical and on-screen branching databases. They will create an identification tool which they will test out by using it. They will consider real-world uses of branching databases.	<u>Data logging</u> Children consider how and why data is collected over time. They will consider how special input devices called sensors can be used to monitor the environment. They will create data, and access data captured over long periods of time. Children will use computers to review and analyse data. They will pose and answer questions using data loggers.	<u>Flat-file databases</u> Children look at how a flat-file database can be used to organise data. They use tools within a database to order and answer questions about data. Children create graphs and charts from their data to help solve problems and answer questions. They present their work to others.	<u>Spreadsheets</u> Children are introduced to spreadsheets, they are supported in organising data into columns and rows to create their own data set. They are taught the importance of formatting data to support calculations and are introduced to formulas. Children are taught to apply formulas to a range of cells. They use spreadsheets to plan an event and answer questions, creating charts and evaluating results.

	• I can tell you about different kinds of information such as pictures, video, text and sound.	• I can talk about the different ways in which information can be shown. • I can use technology to collect information, including photos, video and sound. • I can sort different kinds of information and present it to others. • I can add information to a pictograph and talk to you about what I have found out.	• I can make and save a chart or graph using the data I collect. • I can talk about the data that is shown in my chart or graph. • I am starting to understand a branching database. • I can tell you what kind of information I could use to help me investigate a question.	• I can talk about the different ways data can be organised. • I can search a ready-made database to answer questions. • I can collect data help me answer a question. • I can add to a database. • I can make a branching database. • I can use a data logger to monitor changes and can talk about the information collected.	• I can organise data in different ways. • I can collect data and identify where it could be inaccurate. • I can plan, create and search a database to answer questions. • I can choose the best way to present data to my friends. • I can use a data logger to record and share my readings with my friends.	• I can use a spreadsheet and database to collect and record data. • I can choose an appropriate tool to help me collect data. • I can present data in an appropriate way. • I can search a database using different operators to refine my search. • I can talk about mistakes in data and suggest how it could be checked.	• I can plan the process needed to investigate the world around me. • I can select the most effective tool to collect data for my investigation. • I can check the data I collect for accuracy and plausibility. • I can interpret the data I collect. • I can present the data I collect in an appropriate way. • I use the skills I have developed to interrogate a database.
Programming	Explore and give simple instructions to a bee-bot to make it move in different ways.	<u>Moving a robot</u> An introduction to early programming concepts. Children will explore using individual commands .They will identify what each floor robot command does	<u>Robot algorithms</u> Developing understanding of instructions in sequences and the use of logical reasoning to predict outcomes. Children will use given commands	<u>Sequence in music</u> Children explore the concept of sequencing in programming through 'Scratch'. Children learn to use motion, sound and event 'blocks' to create their own program featuring	<u>Repetition in shapes</u> Children look at repetition and loops within programming. They create programs by planning, testing and modifying commands to create shapes and	<u>Selection in physical computing</u> Children use physical computing to explore the concept of selection in programming. 'Crumble programming'	<u>Variables in games</u> Children explore the concept of variables in programming through games in 'Scratch'. They find out what variables are and relate them to real-world examples of

		and use that knowledge to start predicting the outcome of programs. Children are also introduced to the early stages of program design through the introduction of algorithms. <u>Introduction to animation</u> Children are introduced to on-screen programming through ScratchJr. Learners will explore the way a project looks by investigating sprites and backgrounds. They will use programming blocks to use, modify, and create programs. Learners will also	in different orders to investigate how the order affects the outcome. Children will also learn about design in programming. They will design algorithms and then test those algorithms as programs and debug them. <u>Introduction to quizzes</u> Recap on learning from the Year 1 ScratchJr. Children begin to understand that sequences of commands have an outcome and make predictions based on their learning. They use and modify designs to create their own quiz questions in ScratchJr and realise these designs in	sequences. They apply stages of program design. <u>Events and actions</u> Children explore links between events and actions, they begin by moving a 'Scratch' sprite in 4 directions. They then explore movement in the context of a maze. Children are introduced to programming extensions, through the use of pen blocks. Children design and code their own maze tracing program.	patterns. They will use 'Logo'. <u>Repetition in games</u> Children explore the concept of repetition in programming using 'Scratch'. They will discover similarities between 'Scratch' and 'Logo'. Children look at the difference between count-controlled and infinite loops. They modify existing animations and games using repetition. Children design and create a game which uses repetition, applying stages of programming design throughout.	environment. They are introduced to a microcontroller and learn how to connect and program components. Children are introduced to conditions as a means of controlling the flow of actions. <u>Selection in quizzes</u> Children develop their knowledge of selection by revisiting how conditions can be used in programs. They represent their understanding in algorithms and by constructing programs using 'Scratch'. Children use their knowledge or writing programs and using selection, to design a quiz in response to a given task and	values that can be set and changed. Children follow the 'Use-Modify-Create model' to experiment with variables in an existing project. They design and improve their games in 'Scratch'. <u>Sensing</u> Children are given the opportunity to use all that they have learnt in programming. They will also utilise a physical device – the 'micro:bit'.

		be introduced to the early stages of program design through the introduction of algorithms.	ScratchJr using blocks of code. Finally, learners evaluate their work and make improvements to their programming projects.			implement it as a program.	
	• I can make a floor robot move. • I can use simple software to make something happen. • I can make choices about the buttons and icons I press, touch or click on.	• I can give instructions to my friend and follow their instructions to move around. • I can describe what happens when I press buttons on a robot. • I can press the buttons in the correct order to make my robot do what I want. • I can describe what actions I will need to do to make something happen and begin to use the word algorithm. • I can begin to predict what will happen for a short sequence of instructions.	• I can give instructions to my friend (using forward, backward and turn) and physically follow their instructions. • I can tell you the order I need to do things to make something happen and talk about this as an algorithm. • I can program a robot or software to do a particular task. • I can look at my friend's program and tell you what will happen. • I can use programming software to make objects move.	• I can break an open-ended problem up into smaller parts. • I can put programming commands into a sequence to achieve a specific outcome. • I keep testing my program and can recognise when I need to debug it. • I can use repeat commands. • I can describe the algorithm I will need for a simple task. • I can detect a problem in an algorithm which could result in unsuccessful programming.	• I can use logical thinking to solve an open-ended problem by breaking it up into smaller parts. • I can use an efficient procedure to simplify a program. • I can use a sensor to detect a change which can select an action within my program. • I know that I need to keep testing my program while I am putting it together. • I can use a variety of tools to create a	• I can decompose a problem into smaller parts to design an algorithm for a specific outcome and use this to write a program. • I can refine a procedure using repeat commands to improve a program. • I can use a variable to increase programming possibilities. • I can change an input to a program to achieve a different output. • I can use 'if' and 'then' commands to select an	• I can deconstruct a problem into smaller steps, recognising similarities to solutions used before. • I can explain and program each of the steps in my algorithm. • I can evaluate the effectiveness and efficiency of my algorithm while I continually test the programming of that algorithm. • I can recognise when I need to use a variable to achieve a required output. • I can use a variable and operators to stop

		• I can begin to use software/apps to create movement and patterns on a screen.	I can watch a program execute and spot where it goes wrong so that I can debug it.		program. • I can recognise an error in a program and debug it. • I recognise that an algorithm will help me to sequence more complex programs. • I recognise that using algorithms will also help solve problems in other learning such as Maths, Science and Design and Technology.	action. • I can talk about how a computer model can provide information about a physical system. • I can use logical reasoning to detect and debug mistakes in a program. • I use logical thinking, imagination and creativity to extend a program.	a program. • I can use different inputs (including sensors) to control a device or onscreen action and predict what will happen. • I can use logical reasoning to detect and correct errors in algorithms and programs.
E-Safety	•I can ask an adult when I want to use the Internet. •I can tell an adult when something worrying or unexpected happens while I am using the Internet. •I can be kind to my friends. •I can talk about the amount of time I spend using a computer / tablet /	•I can keep my password private. •I can tell you what personal information is. •I can tell an adult when I see something unexpected or worrying online. •I can talk about why it's important to be kind and polite. •I can recognise an age appropriate	•I can explain why I need to keep my password and personal information private. •I can describe the things that happen online that I must tell an adult about. •I can talk about why I should go online for a short amount of time. •I can talk about why it is important	•I can talk about what makes a secure password and why they are important. •I can protect my personal information when I do different things online. •I can use the safety features of websites as well as reporting concerns to an adult.	•I choose a secure password when I am using a website. •I can talk about the ways I can protect myself and my friends from harm online. •I use the safety features of websites as well as reporting concerns to an adult. •I know that	•I protect my password and other personal information. •I can explain why I need to protect myself and my friends and the best ways to do this, including reporting concerns to an adult. •I know that anything I post online can be seen, used and	• I protect my password and other personal informatio n. • I can explain the consequen ces of sharing too much about myself online.

	game device. • I am careful with technology devices.	website. • I can agree and follow sensible e-Safety rules.	to be kind and polite online and in real life. • I know that not everyone is who they say they are on the Internet.	• I can recognise websites and games appropriate for my age. • I can make good choices about how long I spend online. • I ask an adult before downloading files and games from the Internet. • I can post positive comments online.	anything I post online can be seen by others. • I choose websites and games that are appropriate for my age. • I can help my friends make good choices about the time they spend online. • I can talk about why I need to ask a trusted adult before downloading files and games from the Internet. • I comment positively and respectfully online.	may affect others. • I can talk about the dangers of spending too long online or playing a game. • I can explain the importance of communicating kindly and respectfully. • I can discuss the importance of choosing an age-appropriate website or game. • I can explain why I need to protect my computer or device from harm. • I know which resources on the Internet I can download and use.	• I support my friends to protect themselves and make good choices online, including reporting concerns to an adult. • I can explain the consequences of spending too much time online or on a game. • I can explain the consequences to myself and others of not communicating kindly and respectfully. • I protect my

							computer or device from harm on the Internet.