St Joseph's RC Primary School, Computing Long Term Plan

Nursery	<u>Knowledge:</u> To know that technology can be used in everyday life. <u>Skills:</u> Use technology in their play. Use technology to create a desired effect. <u>Vocabulary:</u> Computer, technology *How does this prepare them for the following years?* The children become familiar with the use of technology and gain confidence in selecting tools.
Reception	<u>Knowledge:</u> To know that technology can be used in everyday life. To know that technology can be used to create desired effects. <u>Skills:</u> To select tools for a desired effect. To be able to control movements. To use technology in their play. <u>Vocabulary:</u> Computer, technology, mouse, select, mouse *How does this prepare them for the following years?* The children become familiar with the use of technology and gain confidence in selecting tools to create desired effects.

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Years 1 / 2 Cycle A	Autumn 1 and 2 We are Programmers (Course A) https://code.org/educate/curriculum/csf Software: Code.org Knowledge: How to stay safe online, including the internet. How the internet can be explored to find out new things. To know what an algorithm is and they will only follow the instructions given. To know what debugging is and how to debug a simple program. To know what repetition is and how this links to looping. Skills: To use algorithms to program a device to solve a problem or to 'do' something. Write simple programs through being shown how to use the code.org system Recognise errors which must be fixed. Begin to use strategies to debug. Use loops for repetition in their coding. Vocabulary: Algorithms, program, device, instructions, code, internet safety	Spring 1 We are TV chefs Software: iPads, iMovie or Microsoft Movie Maker Knowledge: How to respect others online and show respect for their privacy and content. How to create content, e.g. working with digital photos and video (including some editing e.g. cropping, rotating). To know how to organise their media e.g. sorting files into their own content directory in Children's Work. To understand where something is stored e.g. on the computer, a network or online. To know what retrieval is. Skills: To use devices in a safe and responsible manner. To use an iPad safely to record content. To stop, start and delete content when necessary. To use video editing software to edit footage and create a video. To upload and save their footage, with support. Vocabulary: Video, store, save, edit, upload.	Spring 2 We are collectors Software: Combination of web-browsing software e.g. Chrome, Internet Explorer + PowerPoint/ IWB Software to organise images. Also use image libraries such as: https://pixabay.com/ Knowledge: How to respect others online and show sensitivity for their privacy. Know how to report a worry regarding content online. Know common uses of information technology. To know that the internet allows us to access images store on other computers called web servers, anywhere in the world. Skills: Copy and paste images from the internet into power point or IWB slide. Organise and retrieve image safely on an online image library. Organise picture content on power point or IWB slides in a coherent way under headings. Save and retrieve content when required. Vocabulary:	Summer 1 We are story tellers Software: Book Creator Knowledge: To know how to create content, e.g. a digit story book with text, voice recordings and images (including some editing e.g. cropping, rotating). To know how to organise their media e.g. sorting files into their own content directory in Children's Work. To understand where something is stored e.g. on the computer, a network or online. To know what retrieval is. To understand how a talking book differs from a paper-based book. Skills: Use sound recording equipment to record sounds. Develop collaboration skills as they work together in a group. Talk about and reflect on their use of ICT share recordings with an audience. Vocabulary: Store, retrieve, record, talking book	Summer 2 We are astronauts Software: Sprite Lab on code.org Knowledge: To know what an algorithm is and how to use them. To understand that algorithms will follow the instructions given. To know how to write their own programs. To know what debugging is and how to debug a simple program. To know what persistence and resilience mean. Skills: Convert simple algorithms to programs. Predict what a simple program will do. Spot and fix (debug) errors in their programs. Vocabulary: Algorithm, coding, sprite, persistence and resilience.

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	How does this prepare them for the following years? In lower KS2 the children continue to develop their coding skills. They will continue to write code, debug it, and use loops. Developing early skills in computational thinking and reasoning will help the children as their skillset is further developed.	*How does this prepare them for the following years?* In lower KS2 the children undertake another topic which uses recording devices, where they need to plan, record and edit.	Internet, copy and paste, clipart, web server, save, retrieve *How does this prepare them for the following years?* The children will continue to use the internet safely. In lower KS2 they will continue to use more software to communicate their ideas to other people, in the 'We are Communicators' unit. They will also be presenting data and information on PowerPoint in the unit 'We are Meteorologists'.	*How does this prepare them for the following years?* In lower KS2 the children undertake another topic which uses recording devices, where they need to plan, record and edit.	*How does this prepare them for the following years?* Understanding how to write an algorithm is a recurring element of the computing curriculum and is revisited each year.

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Years	Autumn 1 and 2	Spring 1	Spring 2	Summer 1	Summer 2
1 / 2 Cycle B	We are Programmers (Course B) https://code.org/educate/curriculum/csf Software: Code.org Knowledge: To know what an algorithm is and they will only follow the instructions given. To know what debugging is and how to debug a simple program. To know how to write their own programs. To know what repetition is and how this links to looping. Skills: To use algorithms to program a device to solve a problem or to 'do' something. Write simple programs through being shown how to use the code.org system Recognise errors which must be fixed. Begin to use strategies to debug. Use loops for repetition in their coding. Use logical reasoning to predict the behaviour of simple programs. Vocabulary: Algorithms, program, device, instructions, code, internet safety	We are photographers Hardware: digit camera devices/iPads Software: Picasa /Pixelr /Picasa Web/ Photoshop Elements Knowledge: How to respect others online and show respect for their privacy and content. How to create content, e.g. working with digital photos and video (including some editing e.g. cropping, rotating). To know how to organise their media e.g. sorting files into their own content directory in Children's Work. To understand where something is stored e.g. on the computer, a network or online. To know what retrieval is. Skills: Use a digital camera or camera app to take digital photographs. Review and reject or pick the images they take. Edit and enhance their photographs. Select their best images to include in a shared portfolio. Vocabulary: Digital photo, photography, edit, save, store, online portfolio *How does this prepare them for the following years?*	We are researchers Software: Freemind / Linkbunch / PowerPoint- Smart NoteBook Knowledge: How to respect others online and show sensitivity for their privacy. Know how to report a worry regarding content online and who to go to / how to get support. Know common uses of information technology, beyond school. To know how to use search engine safely to find information on a topic. Skills: Use collaboration skills through working as part of a group. Develop research skills through searching for information on the internet. Improve note-taking skills through the use of mind mapping. Develop presentation skills through creating and delivering a short multimedia presentation. Vocabulary: Research, online safety, search engines *How does this prepare them for the following years?*	We are zoologist Software: Excel Knowledge: To know how to create content, e.g. input data into Excel and use this to create graphs and charts. To know how to organise their media e.g. sorting files into their own content directory in Children's Work. To understand where something is stored e.g. on the computer, a network or online. To know what retrieval is. Skills: Collect data using tick charts or tally charts. Use simple charting software to produce pictograms and other basic charts. Take, edit and enhance photographs. Record information on a digital map. Vocabulary: Excel, save, retrieve, tally, charts, graphs. *How does this prepare them for the following years?*	We are painters Knowledge: Know how to create content on paint and similar apps. To understand how this use of ICT differs from using paint and paper. To know how to organise their media e.g. sorting files into their own content directory in Children's Work. To understand where something is stored e.g. on the computer, a network or online. To know what retrieval is. Skills: Select and use appropriate painting tools to create and change images on the computer. Create an illustration for a particular purpose. Reflect on their work and act on feedback received. Vocabulary: Paint, portrait, save, retrieve. *How does this prepare them for the following years?*

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	How does this prepare them for the following years? In lower KS2 the children continue to develop their coding skills. They will continue to write code, debug it, and use loops. Developing early skills in computational thinking and reasoning will help the children as their skillset is further developed in KS2.	In lower KS2 the children undertake another topic which uses recording devices, where they need to plan, record and edit.	The children will continue to use the internet safely. In lower KS2 they will continue to use more software to communicate their ideas to other people, in the 'We are Communicators' unit. They will also be presenting data and information on PowerPoint in the unit 'We are Meteorologists'.	In lower KS2 the children will use Excel and similar programs again, developing skills further in the 'We are Opinion Pollsters' and 'We are Meteorologists' units.	In upper KS2 the children embark on another art unit called 'We are Artists', in which the children to make artwork using a wider range of software.

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Years 3/4 Cycle A	Autumn 1 We are Programmers (Course C Part 1) https://code.org/educate/curriculum/csf Software: Code.org Knowledge: To know what sequencing in programming refers to. To know what repetition is. To be able to explain the thinking behind their algorithms. To develop a more considered approach, planning code rather than using trial and error approach. Skills: To write simple algorithms which have been planned and considered. To be able to explain choices made when coding. To debug coding when necessary. Vocabulary: Sequencing, programming, repetition, looping, algorithm	Autumn 2 We are Programmers (Course D Part 2) https://code.org/educate/curriculum/csf Software: Code.org Knowledge: To know what sequencing in programming refers to. To know what repetition is. To know what selection and variables refer to in advanced coding. To be able to explain the thinking behind their algorithms. To develop a more considered approach, planning code rather than using trial and error approach. Skills: To write simple algorithms which have been planned and considered. To be able to explain choices made when coding. To debug coding when necessary. Vocabulary: Sequencing, programming,	Spring 1 We are musicians Software: Isle of Tune (Web-based) Knowledge: To know how to 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. Collect, analyse, evaluate and present data and information. Skills: Use one or more programs to edit music. Create and develop a musical composition, refining their ideas through reflection and discussion. Use collaboration skills. Develop an awareness of how their composition can enhance work in other media. Vocabulary: Program, composition, collaborate, media.	Spring 2 We are presenters Videoing performance Software: iMovie Knowledge: To know how to 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. Collect, analyse, evaluate and present data and information. Understand the qualities of effective video, such as the importance of narrative, consistency, perspective and scene length. Skills: Gain skills in shooting live video, such as framing shots, holding the camera steady, and reviewing. Edit video, including adding narration and editing clips by setting in/out points. Vocabulary: Framing, editing, shooting, narration, reviewing. *How does this prepare them for the following years?* In upper KS2 the children use other software programs creatively to	Summer 1 We are communicators. Software: Web-based email- LGFL via Outlook/ PowerPoint/ Web-based Wiki-Software/ Word. Knowledge: To understand/recognise that their online actions impact others. To develop some awareness of their digital footprint as they use the internet. To know that they can talk to the police, in confidence to child line, CEOP (Child Exploitation + Online Protection Command) etc. To understand how different computers around a network, or around the world, are connected (both physically and through their networking programming). To know that information is digitised before being sent on. Skills: Develop a basic understanding of how email works gain skills in using email. Be aware of broader issues surrounding email, including 'netiquette' and e-safety.	Summer 2 We are HTML Editors Software: Web-Based e.g. Code Academy HTML Introduction Knowledge: To understand/recognise that their online actions impact others. To develop some awareness of their digital footprint as they use the internet. To know that they can talk to the police, in confidence to child line, CEOP (Child Exploitation + Online Protection Command) etc. To understand how different computers around a network, or around the world, are connected (both physically and through their networking programming). To understand some technical aspects of how the internet makes the web possible. Understand some of the risks in using the web. Skills: To use HTML tags for elementary mark up. To use hyperlinks to connect ideas and sources.

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	How does this prepare them for the following years? In upper KS2 the children continue to develop their coding skills through using code.org where they will build on the skills learnt this year but will require more on logic than trial and error.	repetition, looping, algorithm, variables, selection *How does this prepare them for the following years?* In upper KS2 the children continue to develop their coding skills through using code.org where they will build on the skills learnt this year but will require more on logic than trial and error.	*How does this prepare them for the following years?* In upper KS2 the children use other software programs creatively to make pieces of art. This unit gives the children the opportunity to explore software creativity.	make pieces of art. This unit gives the children the opportunity to explore software creativity.	Work collaboratively with a remote partner to experience video conferencing. Vocabulary: Digit footprints, emails, netiquette, collaboration, video calling. *How does this prepare them for the following years?* In upper KS2 the children will build on the skills developed in this unit when they start a blog.	Code up a simple web page with useful content. Vocabulary: HMTL, Hyperlinks, code *How does this prepare them for the following years?* In upper KS2 the children undertake a web develop unit which builds on the skills of HTML.

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Years 3/4 Cycle B	Autumn 1 We are Programmers (Course D Part 1) https://code.org/educate/curriculum/csf Software: Code.org Knowledge: To know what sequencing in programming refers to. To know what repetition is. To be able to explain the thinking behind their algorithms. To develop a more considered approach, planning code rather than using trial and error approach. Skills: To write simple algorithms which have been planned and considered. To be able to explain choices made when coding. To debug coding when necessary. Vocabulary: Sequencing, programming, repetition, looping, algorithm	Autumn 2 We are Programmers (Course C Part 2) https://code.org/educate/curriculum/csf Software: Code.org Knowledge: To know what sequencing in programming refers to. To know what repetition is. To know what selection and variables refer to in advanced coding. To be able to explain the thinking behind their algorithms. To develop a more considered approach, planning code rather than using trial and error approach. Skills: To write simple algorithms which have been planned and considered. To be able to explain choices made when coding. To debug coding when necessary. Vocabulary: Sequencing, programming, repetition, looping,	Spring 1 We are opinion pollsters Software: Excel / InspireData / Google Drive Knowledge: To know the importance of privacy in relation to data and how to share information responsibly. To know how to use software with support, then independently before combining software and selecting it for themselves. To know how to collect, analyse, evaluate and present data and understand this is an important application of computers. Skills: Understand some elements of survey design. Understand some ethical and legal aspects of online data collection. Use the web to facilitate data collection. Gain skills in using charts to analyse data. Gain skills in interpreting results.	Spring 2 We are meteorologists Software: Excel / Google Drive/ PowerPoint / IWB software Hardware: data loggers, video recorders/webcams Knowledge: To know how to use software with support, then independently before combining software and selecting it for themselves. To know how to collect, analyse, evaluate and present data and understand this is an important application of computers. Skills: Understand different measurement techniques for weather, both analogue and digital. Use computer-based data logging to automate the recording of some weather data. Use spreadsheets to create charts analyse data, explore inconsistencies in data and make predictions. Work with data they have generated or collected for themselves, as well as big, public datasets. Practise using presentation software and, optionally, video. Vocabulary:	Summer 1 We are network engineers Software: Access to school network and command prompt Knowledge: To understand how different computers around a network, or around the world, are connected (both physically and through their networking programming). To know that information is digitised before being sent on. To understand the physical hardware connections necessary for computer networks to work. Skills: Understand and use some features of internet protocols. Use some diagnostic tools for investigating network connections. Develop a basic understanding of how domain names are converted to IP addresses. Vocabulary: Domain name, hardware, networks, diagnostic tools, connections, IP address. *How does this prepare them for the following years?*	Summer 2 We are software developers Knowledge: To know how to design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems. Splitting problems into smaller parts is part of computational thinking. Skills: Develop an educational computer game using selection and repetition. Understand and use variables. Start to debug computer programs. Recognise the importance of user interface design, including consideration of input and output. Vocabulary: Selection, repetition, variables, debug, interface design. *How does this prepare them for the following years?* These skills are repeated in the code.org courses throughout their school experience.

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	How does this prepare them for the following years? In upper KS2 the children continue to develop their coding skills through using code.org where they will build on the skills learnt this year but will require more on logic than trial and error.	algorithm, variables, selection *How does this prepare them for the following years?* In upper KS2 the children continue to develop their coding skills through using code.org where they will build on the skills learnt this year but will require more on logic than trial and error.	<u>Vocabulary:</u> Survey, data collection, interpret and analyse. *How does this prepare them for the following years?* In upper KS2 the children will continue to use the internet safely and learn about privacy in the blogging unit.	Software, collecting data, analysing and evaluating data, automate, spreadsheets. *How does this prepare them for the following years?* In upper KS2 the children will begin to use other software apps, applying the skills learnt and learn about privacy in the blogging unit.	In upper KS2 the children will be on their understanding of computer networks in the web developer unit.	

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Years 5/ 6 Cycle A	Autumn 1 We are bloggers Software: Word-press Knowledge: To use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. To understand how different computers around a network, or around the world, are connected (both physically and through their networking programming). To know that information is digitised before being sent on and the effects this has had on communication. Skills: Create a sequence of blog posts on a particular, theme or topic. Incorporate additional media, such as photo, audio or video. Comment critically on the posts of others.	Autumn 2 and Spring 1 We are programmers Course E https://code.org/educate/curriculum/csf (Sprites, Digital Citizenship, Nested Loops, Functions + Conditionals) Software: Code.org Knowledge: To understand the term cyber bullying and to spot when it is happening. To know how to be a responsible digit citizen. To understand legal and ethical responsibilities. To know that sequencing in programming refers to the steps taken and in which order to achieve a goal. To know that repetition is understanding the use of repeating. To know variables refers to the idea of programming to be prepared for multiple answers. To know how a simple algorithm works. To know how to spot and correct errors in algorithms. Skills: Use technology safely, respectfully and responsibility. Recognise acceptable/unacceptable behaviour. Identify a range of ways to report concerns about content and contact. To use sequence, selection, and repetition in programs.	Spring 2 We are cryptographers Software: Scratch / Snap! / Black Chamber Knowledge: To use technology safely, respectfully and responsibly. To understand legal and ethical responsibilities. To understand how different computers around a network, or around the world, are connected (both physically and through their networking programming). To know that information is digitised before being sent on and the effects this has had on communication. To understand the need for private information to be encrypted. To appreciate the need to use complex passwords and to keep them secure. Skills: To be familiar with semaphore and Morse code. To encrypt and decrypt messages in simple ciphers. To have some understanding of how encryption works on the web. Vocabulary:	Summer 1 We are artists Software: Scratch, Inkscape / Illustrator / RoamerWorld Knowledge: To know how to use software with support, then independently before combining software and selecting it for themselves. To know what sequencing in programs refers to. That repetition is understanding the use of repeating. Understand the links between geometry and art. Skills: Become familiar with the tools and techniques of a vector graphics package. Develop an understanding of turtle graphics. Experiment with the tools available, refining and developing their work as they apply their own criteria to evaluate it and receive feedback from their peers. Develop some awareness of computer-generated art, in particular fractal-based landscapes.	Summer 2 We are web developers Software: Codeacademy Knowledge: Know that splitting problems into smaller parts is part of computational thinking. To understand how different computers around a network, or around the world, are connected (both physically and through their networking programming). To know that information is digitised before being sent on and the effects this has had on communication. To understand that their online actions impact others. To understand legal and ethical responsibilities. To understand how to become aware of their digital footprint. To know that they can talk to the police, in confidence to child line, CEOP (Child Exploitation + Online Protection Command) etc. Skills:

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	Develop a critical, reflective view of a range of media, including text. <u>Vocabulary:</u> Blog, blog post, medium, media, network *How does this prepare them for the following years?* This topic prepares the children for KS3 when they have to create a digital artefact for a given audience.	To 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. Develop a more considered approach, planning code rather than using trial and error approach. <u>Vocabulary:</u> Cyberbullying, digital citizen, sequencing, programming, loops, variables, algorithm, code *How does this prepare them for the following years?* This topic prepares the children for KS3 when they continue to learn how to use technology safely, respectfully, responsibly and securely.	Ciphers, code, encrypt, decrypt. *How does this prepare them for the following years?* This topic prepares the children for KS3 when they continue to learn how to use technology safely, respectfully, responsibly and securely. In addition, it prepares them to begin understanding simple Boolean logic through their knowledge of encryption and decryption.	<u>Vocabulary:</u> Geometry, vector, turtle graphics, fractal-based landscapes. *How does this prepare them for the following years?* This topic prepares them for KS3 as they undertake creative projects that involve selecting, using, and combining multiple applications.	To develop a simple web page for a purpose. <u>Vocabulary:</u> Web, developer, communication, audience *How does this prepare them for the following years?* This topic prepares the children for KS3 when they have to create a digital artefact for a given audience.

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Years 5/ 6 Cycle B	Autumn 1 and 2 We are Programmers (Course F) https://code.org/educate/curriculum/csf Sprites, Digital Citizenship, Variables, Loops, Data Software: Code.org Knowledge: To know how to appropriately communicate online. To know what sequencing is. To know what selection and variables refer to. To know that repetition is understanding the use of repeating. To know that splitting problems into smaller parts is part of computational thinking. Skills: To use sequence, selection, and repetition in programs. To work with variables and various forms of input and output. To be able to debug specific programs by reviewing code created. To use logical reasoning to explain how some simple algorithms work, detecting and correcting errors.	Spring 1 We are Computer Scientists (CS Unplugged, Count the Dots—Binary Numbers) Software: CS Unplugged Knowledge: To understand that computers use and rely on binary code. To know what binary code is and how it is used. To know how to design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems. To know that information is digitised before being sent on e.g. packets of information. Skills: To solve problems with binary code. To use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. To solve problems by decomposing them into smaller parts. Vocabulary: Binary *How does this prepare them for the following years?* In KS3 children use two or more programming languages, at least one of	Spring 2 We are Programmers (Lego or Sphero) Knowledge: To understand legal and ethical responsibilities. To know that sequencing in programming refers to the steps taken and in which order to achieve a goal. To know that repetition is understanding the use of repeating. To know variables refers to the idea of programming to be prepared for multiple answers. To know how a simple algorithm works. To know how to spot and correct errors in algorithms. Skills: Use technology safely, respectfully and responsibility. To use sequence, selection, and repetition in programs. To 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.	Summer 1 and 2 We are app planners/ developers Software: Code.org alternative e.g. Appshed Knowledge: To understand that some content may have been written to give a balanced overview, while other elements may have been written to advance one side of an argument. To know how to use software under the control of the teacher. To understand how different computers around a network, or around the world, are connected (both physically and through their networking programming). To know that information is digitised before being sent on and the effects this has had on communication. Develop an awareness of the capabilities of smartphones and tablets. Understand geolocation, including GPS. To know how to use a programming toolkit or development platform. Skills: To search using effective terms. Use software with increasing independence, combine software and select software themselves. Design, write algorithm and debug programs that accomplish specific goals, including controlling or simulating physical systems. Solve problems by decomposing them into smaller parts. Identify interesting, solvable problems, evaluate competing products and pitch a proposal for a smartphone or tablet app. Import existing media assets to their project.

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	Develop a more considered approach, planning code rather than using trial and error approach, explaining their thinking. Vocabulary: Sequencing, variables, loops, selection, coding, online safety *How does this prepare them for the following years?* In KS3 children learn to understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching]; use logical reasoning to compare the utility of alternative algorithms for the same problem. They continue to be taught how to use technology safely.	which is textual, to solve a variety of computational problems; make appropriate use of data structures [for example, lists, tables or arrays]; design and develop modular programs that use procedures or functions. They continue to be taught how to use technology safely.	Develop a more considered approach, planning code rather than using trial and error approach. Vocabulary: Sequencing, programming, loops, variables, algorithm, code *How does this prepare them for the following years?* This topic prepares the children for KS3 when they continue to create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability.	Thoroughly test and evaluate their app. Vocabulary: App, debug, network, geolocation, GPS, algorithm *How does this prepare them for the following years?* In KS3, children will undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users. They continue to be taught how to use technology safely.