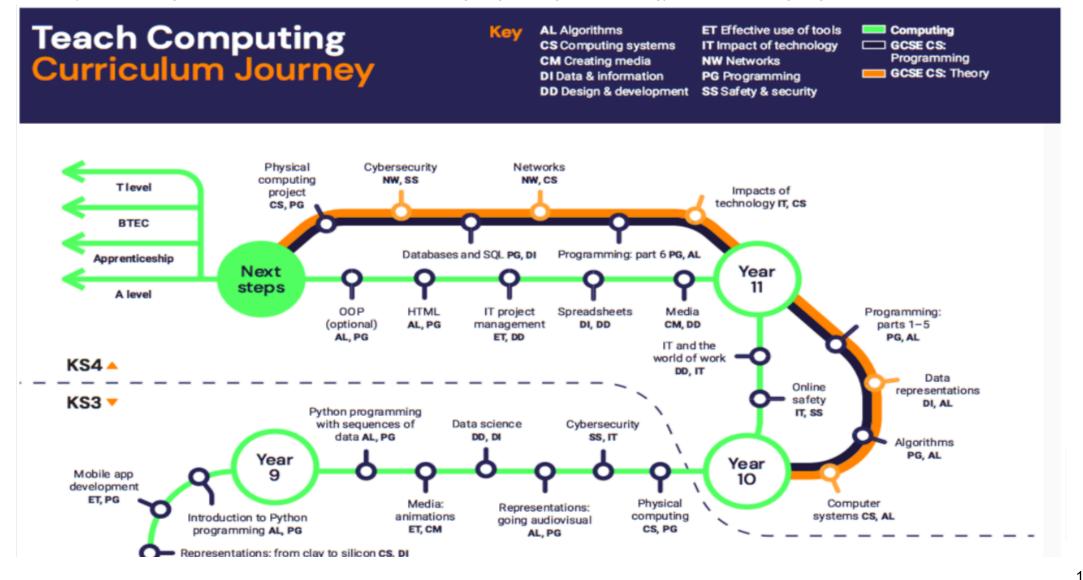


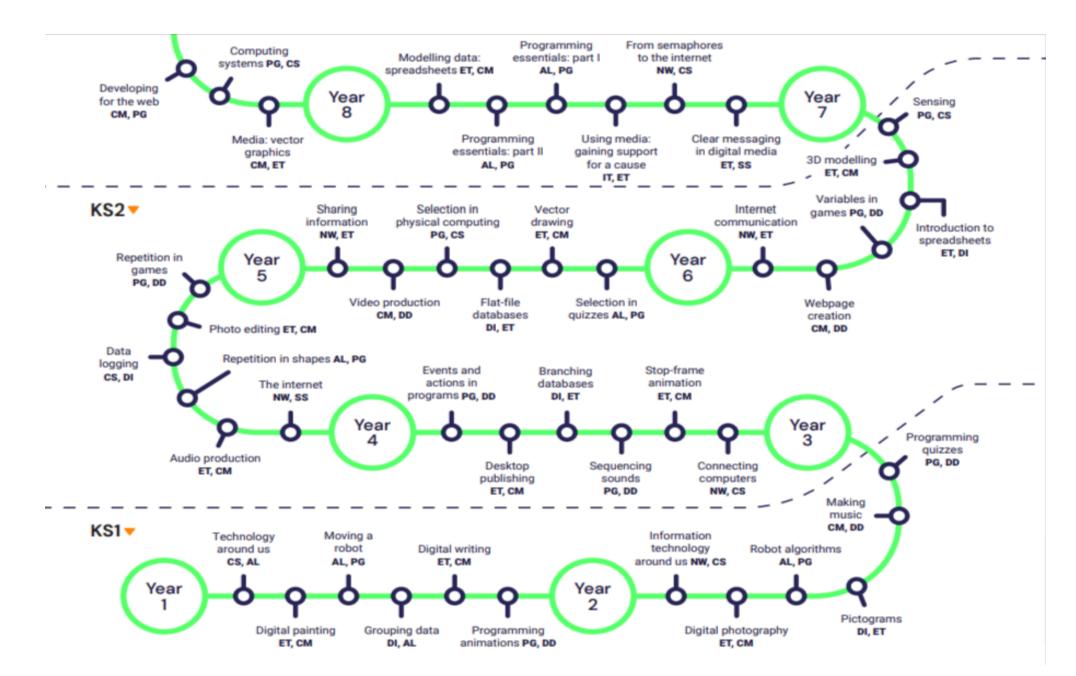


At St Lukes, the Teach Computing scheme is used as an approach with links being made to other subjects to create an interconnecting curriculum. The teach computing scheme follows on in most Newham secondary schools and as such, will provide pupils with the familiarity and consistency needed in a new environment to support easy transition. Lego WeDo is also used as a hook to link coding(programming) and technology to the topics being taught in each term.













Level Expected at the End of EYFS

The statements selected to be used in our EYFS Progression map are the most relevant statements from Development Matters age ranges for Three and Four-Year-Olds and Reception and highlights the statements within the ELGs which feed into the programme of study for computing.

Computing			
Nursery	Personal, Social and Emotional Development		 Remember rules without needing an adult to remind them.
(Three and Four-Year-Olds)	Physical Development		 Match their developing physical skills to tasks and activities in the setting.
	Understanding the World		Explore how things work.
Reception	Personal, Social and Emotional Development		 Show resilience and perseverance in the face of a challenge. Know and talk about the different factors that support their overall health and wellbeing: -sensible amounts of 'screen time'.
	Physical Development		 Develop their small motor skills so that they can use a range of tools competently, safely and confidently.
	Expressive Arts and Design		 Explore, use and refine a variety of artistic effects to express their ideas and feelings.
Early Learning Goals (ELG)	Personal, Social and Emotional Development Managing Self		 Be confident to try new activities and show independence, resilience and perseverance in the face of challenge. Explain the reasons for rules, know right from wrong and try to behave accordingly.
Expressive Arts and Design Creating with Materials		 Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. 	





National Curriculum Expectations

Key Stage 1 National Curriculum Expectations	Key Stage 2 National Curriculum Expectations
Pupils should be taught to:	Pupils should be taught to:
 understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and 	 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
unambiguous instructions;	of input and output;
 create and debug simple programs; use logical reasoning to predict the behaviour of simple programs; 	 use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs;
	 understand computer networks including the internet; how they can provide multiple convision such as the world wide web, and the expertupities they affer for communication
 use technology purposefully to create, organise, store, manipulate and retrieve digital content; 	services, such as the world wide web, and the opportunities they offer for communication and collaboration;
 recognise common uses of information technology 	 use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content;
 beyond school; use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns 	 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;
about content or contact on the internet or other online technologies.	 use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.





Key Stages 1 and 2 Breakdown of outcomes

	KS1	Lower KS2	Upper KS2
Computing Systems and Networks	 Pupils will become familiar with the term 'technology'. They will classify what is and what is not technology in their school and/or classroom. Learners will demonstrate their understanding of how technology helps us in different ways. In Year 1, pupils will : Identify technology i their classroom Use technology and use a computer keyboard Develop mouse skills and keyboard skills Use computer responsibly. Pupils start to explore how information technology (IT) is being used for good in our lives. With an initial focus on IT in the home, Pupils 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. In Year 2, pupils will: Be introduced to what IT is at school and in the world. Explore the benefits of IT Use IT for different types of activities Use IT safely 	 Pupils are challenged to develop their understanding of digital devices, with an initial focus on inputs, processes, and outputs. This is started by comparing digital and non-digital devices, before introducing computer networks that include network infrastructure devices like routers and switches. In Year 3, pupils will: Discuss how digital devices work Identify the parts of a digital device and how they help us explain how a computer network can be used to share information and how it is connected recognise the physical components of a network Pupils will apply their knowledge and understanding of networks, to appreciate the internet as a network of networks which need to be kept secure. They will learn that the World Wide Web is part of the internet, and will be given opportunities to explore the World Wide Web for themselves in order to learn about who owns content and what they can access, add, and create. Finally, they will evaluate online content to decide how honest, accurate, or reliable it is, and understand the consequences of false information. In Year 4, pupils will: describe how networks physically connect to other networks and what internets are made of. outline how websites can be shared via the World Wide Web Describe what a website is and who owns the 	 Pupils will develop their understanding of computer systems and how information is transferred between systems and devices. Learners consider small-scale systems as well as large-scale systems. They explain the input, output, and process aspects of a variety of different real-world systems. Pupils will discover how information is found on the World Wide Web, through learning how search engines work (including how they select and rank results) and what influences searching, and through comparing different search engines. In Year 5, pupils will: explain that computers can be connected together to form systems recognise the role of computer systems in our lives explain how search results are ranked and influenced Pupils will explore how data is transferred over the internet. Initially, they will focus on addressing, before they move on to the makeup and structure of data packets. Pupils will then look at how the internet facilitates online communication and collaboration; they complete shared projects online and evaluate different methods of communication. Finally, they will learn how to communicate responsibly by considering what should and should not be shared on the internet.





		web Evaluate the consequences of unreliable content 	 recognise how data is transferred across the internet explain how sharing information online can help people to work together and evaluate different ways of working together online recognise how we communicate using technology evaluate different methods of online communication
	KS1	Lower KS2	Upper KS2
Creating Media 1	 Pupils explore the world of digital art and its exciting range of creative tools. Pupils are empowered to create their own paintings, while getting inspiration from a range of other artists. Pupils are asked to consider their preferences when painting with, and without, the use of digital devices. In Year 1, pupils will: Pupils learn how to paint using computers How to use shapes and lines Make choices and explain their reasons using tools Paint using a software Compare digital art and paintings. Children will learn to recognise that different devices 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. In Year 2, pupils will: Take photographs in landscape and portrait 	 Pupils will use a range of techniques to create a stop-frame animation using tablets. Next, they will apply those skills to create a story-based animation. This unit will conclude with learners adding other types of media to their animation, such as music and text. In Year 3, pupils will: explain that animation is a sequence of drawings or photographs relate animated movement with a sequence of images plan an animation and identify the need to work consistently and carefully review and improve an animation evaluate the impact of adding other media to an animation Pupils will identify the input device (microphone) and output devices (speaker or headphones) required to work with sound digitally. They will discuss the ownership of digital audio and the copyright implications of duplicating the work of others. In order to record audio themselves, learners will use Audacity to produce a podcast, which will include editing their work, adding multiple tracks, and opening and saving the audio files. Finally, they will evaluate their work and 	 Pupils will be given the opportunity to learn how to create short videos in groups. As they progress through this unit, they will be exposed to topic-based language and develop the skills of capturing, editing, and manipulating video. Active learning is encouraged through guided questions and by working in small groups to investigate the use of devices and software. Pupils are guided with step-by-step support to take their idea from conception to completion. The use of green screens can be incorporated into this unit. At the conclusion of the unit, learners have the opportunity to reflect on and assess their progress in creating a video. In Year 5, pupils will: explain what makes a video effective identify digital devices that can record video capture video using a range of techniques create a storyboard and identify that video can be improved through reshooting and editing consider the impact of the choices made when making and sharing a video Pupils will be introduced to the creation of websites for a chosen purpose. Learners identify what makes a good web page and use this information to design and evaluate their own website using Google Sites. Throughout the process pupils will pay specific





	 Discuss what makes a good photograph and the use of light Choose and add effects Discuss what is real and what is not 	 give feedback to their peers. In Year 4, pupils will: identify that sound can be recorded explain that audio recordings can be edited recognise the different parts of creating a podcast project and apply audio editing skills independently combine audio to enhance podcast project and evaluate their podcast 	 attention to copyright and fair use of media, the aesthetics of the site, and navigation paths. In Year 6, pupils will: review an existing website and consider its structure plan the features of a web page and consider copyright recognise the need to preview pages outline the need for a navigation path recognise the implications of linking to content owned by other people
	KS1	Lower KS2	Upper KS2
Creating Media 2	 This unit will promote pupils' understanding of the various aspects of using a computer to create and change text. They 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. In Year 1, pupils will: Explore a keyboard and add and remove text on a computer Explore the toolbar and make changes to text Explain their choices of tools used compare typing on a computer to writing on paper Pupils 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 	 Pupils will become familiar with the terms 'text' and 'images' and understand that they can be used to communicate messages. They will use desktop publishing software and consider careful choices of font size, colour and type to edit and improve premade documents. They will be introduced to the terms 'templates', 'orientation', and 'placeholders' and begin to understand how these can support them in making their own template for a magazine front cover. They will start to add text and images to create their own pieces of work using desktop publishing software. Pupils will look at a range of page layouts thinking carefully about the purpose of these and evaluate how and why desktop publishing is used in the real world. In Year 3, pupils will: recognise how text and images convey information recognise that text and layout can be edited choose appropriate page settings add content to a desktop publishing publication 	 In this unit, pupils start to create vector drawings. They learn how to use different drawing tools to help them create images. They recognise that images in vector drawings are created using shapes and lines, and each individual element in the drawing is called an object. Pupils layer their objects and begin grouping and duplicating them to support the creation of more complex pieces of work. This unit is planned using the Google Drawings app, other alternative pieces of software are available. In Year 5, pupils will: Explore the use of drawing tools Create image and make effective drawings recognise that vector drawings consist of layers group objects to make them easier to work with Plan and create a vector drawing Pupils will develop their knowledge and understanding of using a computer to produce 3D models. Learners

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	 the movement of animals for inspiration. Finally, learners will share their creations and compare creating music digitally and non-digitally. In Year 2, pupils will: Explore how music makes them feel Identify rhythms and patterns Think of how music can be used use a computer to create a musical pattern create music for a purpose and review and edit 	 consider how different layouts can suit different purposes consider the benefits of desktop publishing Pupils will develop their understanding of how digital images can be changed and edited, and how they can then be resaved and reused. They will consider the impact that editing images can have, and evaluate the effectiveness of their choices. In Year 4, pupils will: explain that the composition of digital images can be changed explain that colours and cloning can be changed in digital images explain that images can be combined and for done for a purpose evaluate how changes can improve an image 	 will initially familiarise themselves with working in a 3D space, moving, resizing, and duplicating objects. They will then create hollow objects using placeholders and combine multiple objects to create a model of a desk tidy. Finally, they will examine the benefits of grouping and ungrouping 3D objects, then go on to plan, develop, and evaluate their own 3D model of a building. In Year 6, pupils will: Explore 3D modelling and modify 3D objects Create 3D objects Plan a 3D model Create a 33D model, modify and evaluate it
	KS1	Lower KS2	Upper KS2
Programming 1	This unit introduces pupils to early programming concepts. Learners will explore using individual commands, both with other pupils and as part of a computer program. They will identify what each floor robot command does and use that knowledge to start predicting the outcome of programs. The unit is paced to ensure time is spent on all aspects of programming and builds knowledge in a structured manner. Pupils are also introduced to the early stages of program design through the introduction of algorithms. In Year 1, pupils will: • explain what a given command will do • follow an instruction • combine forwards and backwards commands to make a sequence	 This unit explores the concept of sequencing in programming through Scratch. It begins with an introduction to the programming environment, which will be new to most pupils. They will be introduced to a selection of motion, sound, and event blocks which they will use to create their own programs, featuring sequences. The final project is to make a representation of a piano. The unit is paced to focus on all aspects of sequences, and make sure that knowledge is built in a structured manner. They also apply stages of program design through this unit. In Year 3, pupils will: Introduce scratch and identify that commands have an outcome explain that a program has a start in a sequence 	 In this unit, learners will use physical computing to explore the concept of selection in programming through the use of the Crumble programming environment. They will be introduced to a microcontroller (Crumble controller) and learn how to connect and program components (including output devices- LEDs and motors) through the application of their existing programming knowledge. Pupils are introduced to conditions as a means of controlling the flow of actions and make use of their knowledge of repetition and conditions when introduced to the concept of selection (through the if, then structure). In Year 5, pupils will: control a simple circuit connected to a computer write a program that includes count-controlled





- combine four direction commands to make sequences
- plan a simple program
- find more than one solution to a problem

This unit develops pupils' understanding of instructions in sequences and the use of logical reasoning to predict outcomes. Pupils will use given commands in different orders to investigate how the order affects the outcome. They will also learn about design in programming. They will develop artwork and test it for use in a program. They will design algorithms and then test those algorithms as programs and debug them.

In Year 2, pupils will:

- describe a series of instructions as a sequence
- explain what happens when we change the order of instructions
- use logical reasoning to predict the outcome of a program
- explain that programming projects can have code and artwork
- design an algorithm
- create and debug a program that I have written

- recognise that a sequence of commands can have an order
- change the appearance of my project
- create a project from a task description

This unit is the first of the two programming units in Year 4, and looks at repetition and loops within programming. Pupils will create programs by planning, modifying, and testing commands to create shapes and patterns. They will use Logo, a text-based programming language.

In Year 4, pupils will:

- identify that accuracy in programming is important
- create a program in a text-based language
- explain what 'repeat' means
- modify a count-controlled loop to produce a given outcome
- decompose a task into small steps
- create a program that uses count-controlled loops to produce a given outcome

loops

- explain that a loop can stop when a condition is met
- explain that a loop can be used to repeatedly check whether a condition has been met
- design a physical project that includes selection
- create a program that controls a physical computing project

This unit explores the concept of variables in programming through games in Scratch. First, pupils find out what variables are and relate them to real-world examples of values that can be set and changed. Then they use variables to create a simulation of a scoreboard. In Lessons 2, 3, and 5, which follow the Use-Modify-Create model, learners experiment with variables in an existing project, then modify them, before they create their own project. In Lesson 4, learners focus on design. Finally, in Lesson 6, learners apply their knowledge of variables and design to improve their games in Scratch.

In Year 6, pupils will:

- define a 'variable' as something that is changeable
- explain why a variable is used in a program
- choose how to improve a game by using variables
- design a project that builds on a given example
- use my design to create a project evaluate my project

		project
KS1	Lower KS2	Upper KS2





Programming 2

This unit introduces pupils 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. Pupils will also be introduced to the early stages of program design through the introduction of algorithms.

In Year 1, pupils will:

- Compare programming tool and join blocks
- identify the effect of changing a value
- explain that each sprite has its own instructions
- design the parts of a project and use my algorithm to create a program

This unit initially recaps on learning from the Year 1 Scratch Junior unit 'Programming B -Programming animations'. Pupils 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 ScratchJr using blocks of code. Finally, learners evaluate their work and make improvements to their programming projects.

In Year 2, pupils will:

- explain that a sequence of commands has a start
- explain that a sequence of commands has an outcome
- create and change a program using a given design
- create a program using my own design

This unit explores the links between events and actions, whilst consolidating prior learning relating to sequencing. Pupils will begin by moving a sprite in four directions (up, down, left and right). They will then explore movement within the context of a maze, using design to choose an appropriately sized sprite. This unit also introduces programming extensions, through the use of pen blocks. Pupils are given the opportunity to draw lines with sprites and change the size and colour of lines. The unit concludes with learners designing and coding their own maze tracing program.

In Year 3, pupil will:

- explain how a sprite moves in an existing project
- create a program to move a sprite in four directions
- adapt a program to a new context
- develop my program by adding features
- identify and fix bugs in a program
- design and create a maze-based challenge

This unit explores the concept of repetition in programming using the Scratch environment. It begins with a Scratch activity similar to that carried out in Logo in Programming unit A, where Pupils can discover similarities between two environments. Pupils look at the difference between count-controlled and infinite loops, and use their knowledge to modify existing animations and games using repetition. Their final project is to design and create a game which uses repetition, applying stages of programming design throughout.

In Year 4, pupils will:

- Use loops to create a shape
- explain that in programming there are infinite

In this unit, pupils develop their knowledge of selection by revisiting how conditions can be used in programs and then learning how the If... Then... Else structure can be used to select different outcomes depending on whether a condition is true or false. They represent this understanding in algorithms and then by constructing programs using the Scratch programming environment. They use their knowledge of writing programs and using selection to control outcomes to design a quiz in response to a given task and implement it as a program.

In Year 5, pupils will:

- Explore conditions and select outcomes
- explain how selection directs the flow of a program
- design a program which uses selection
- create a program which uses selection
- Evaluate the program

This unit is the final KS2 programming unit and brings together elements of all the four programming constructs: sequence from Year 3, repetition from Year 4, selection from Year 5, and variables (introduced in Year 6 – 'Programming A'). It offers pupils the opportunity to use all of these constructs in a different, but still familiar environment, while also utilising a physical device – the micro:bit. The unit begins with a simple program for pupils to build in and test within the new programming environment, before transferring it to their micro:bit. Pupils then take on three new projects in Lessons 2, 3, and 4, with each lesson adding more depth.

In Year 6, pupils will:

• create a program to run on a controllable device





	• decide how my project can be improved	 loops and count controlled loops develop a design that includes two or more loops which run at the same time modify an infinite loop in a given program design a project that includes repetition create a project that includes repetition 	 explain that selection can control the flow of a program update a variable with a user input use a conditional statement to compare a variable to a value design a project that uses inputs and outputs on a controllable device develop a program to use inputs and outputs on a controllable device
	KS1	Lower KS2	Upper KS2
Data and Information	 This unit introduces pupils to data and information. They will begin by using labels to put objects into groups, and labelling these groups. Pupils will demonstrate that they can count a small number of objects, before and after the objects are grouped. They will then begin to demonstrate their ability to sort objects into different groups, based on the properties they choose. Finally, pupils will use their ability to sort objects into different groups to answer questions about data. In Year 1, pupils will: label objects identify that objects can be counted describe objects in different ways count objects with the same properties compare groups of objects answer questions about groups of objects Pupils will discuss 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 	 Pupils will develop their understanding of what a branching database is and how to create one. They will use yes/no questions to gain an understanding of what attributes are and how to use them to sort groups of objects. Pupils will create physical and on-screen branching databases. To conclude the unit, they will create an identification tool using a branching database, which they will test by using it. They will also consider real-world applications for branching databases. In Year 3, pupils will: create questions with yes/no answers identify the attributes needed to collect data about an object create a branching database explain why it is helpful for a database to be well structured plan the structure of a branching database independently create an identification tool In this unit, pupils will consider how and why data is collected over time. Pupils will consider the senses that humans use to experience the environment and how computers can use special input devices called sensors to monitor the environment. Pupils will collect 	 This unit looks at how a flat-file database can be used to organise data in records. Pupils use tools within a database to order and answer questions about data. They create graphs and charts from their data to help solve problems. They use a real-life database to answer a question, and present their work to others. In Year 5, pupils will: use a form to record information compare paper and computer-based databases outline how you can answer questions by grouping and then sorting data explain that tools can be used to select specific data explain that computer programs can be used to compare data visually This unit introduces the pupils to spreadsheets. They will be supported in organising data into columns and rows to create their own data set. Pupils will be taught the importance of formatting data to support calculations, while also being introduced to formulas and will begin to understand how they can be used to apply formulas that include a range of cells, and apply





	 smart choices when using it. In Year 2, pupils will: recognise the uses and features of information technology identify the uses of information technology in the school identify information technology beyond school explain how information technology helps us explain how to use information technology safely recognise that choices are made when using information technology 	 data as well as access data captured over long periods of time. They will look at data points, data sets, and logging intervals. Pupils will spend time using a computer to review and analyse data. Towards the end of the unit, pupils will pose questions and then use data loggers to automatically collect the data needed to answer those questions. In Year 4, pupil will: explain that data gathered over time can be used to answer questions use a digital device to collect data automatically explain that a data logger collects 'data points' from sensors over time recognise how a computer can help us analyse data identify the data needed to answer questions 	formulas to multiple cells by duplicating them. They will use spreadsheets to plan an event and answer questions. Finally, pupils will create charts, and evaluate their results in comparison to questions asked. In Year 6, pupils will: • create and build a data set in a spreadsheet • explain that formulas can be used to produce calculated data • apply formulas to data • create a spreadsheet to plan an event • choose suitable ways to present data
	KS1	Lower KS2	Upper KS2
Online safety	Pupils begin to consider their activity on the internet and learn about ways to keep themselves safe and why it is important to do so. They also compare appropriate and inappropriate activity on the internet and decide what to do next. KS1 Computing National Curriculum Children can use technology safely and respectfully, keeping personal information private; they identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies. Children can: • identify what things count as personal	 Pupils become more aware of their digital footprint by reflecting on their experience on the internet. They are able to understand more about age-appropriate websites and adverts and how adverts are used by companies. Children are also introduced to the concept of plagiarism and citation. KS2 Computing National Curriculum Pupils use technology safely, respectfully and responsibly. They recognise acceptable/unacceptable behaviour and identify a range of ways to report concerns about content and contact. Children can: reflect on their own digital footprint and behaviour online; identify what is appropriate and inappropriate 	 Pupils are encouraged to identify online risks and share their knowledge of the risks and consequences for people online. They begin to think more critically about what they see online and look at the concept of fake news and false photographs. KS2 Computing National Curriculum Pupils use technology safely, respectfully and responsibly. They recognise acceptable/unacceptable behaviour and identify a range of ways to report concerns about content and contact. Children can: protect their password and other personal information; be a good online citizen and friend; judge what sort of privacy settings might be





information;

- identify what is appropriate and inappropriate behaviour on the internet;
- agree and follow sensible online safety rules, e.g. taking pictures, sharing information, storing passwords;
- seek help from an adult when they see something that is unexpected or worrying;
- demonstrate how to safely open and close applications and log on and log off from websites;
- use key vocabulary to demonstrate knowledge and understanding in this strand: safe, meet, accept, reliable, tell, online, trusted, adult, information, safety, personal, key, question, tell, safe, share, stranger, danger, internet.

behaviour on the internet, recognising the term cyberbullying;

- agree and follow sensible online safety rules, e.g. taking pictures, sharing information, storing passwords;
- seek help from an adult when they see something that is unexpected or worrying;
- demonstrate understanding of age-appropriate websites and adverts;
- use key vocabulary to demonstrate knowledge and understanding in this strand: safe, meet, accept, reliable, tell, online, trusted, adult, information, safety, personal, internet, world wide web, communicate, message, social media, email, password,

cyberbullying/bullying, plagiarism, profiles, account, private, public.

relevant to reducing different risks;

- seek help from an adult when they see something that is unexpected or worrying;
- discuss scenarios involving online risk;
- use key vocabulary to demonstrate knowledge and understanding in this strand: spam, link, privacy, virus, scam, phishing, inbox, junk, sender, subject, secure, safe, account, online, private, social media, adverts, cyberbullying, reporting, anonymous, victim, fraud/fraudulent, policy, private/personal.