Year 3 Computing Curriculum

	Autumn 1	Autumn 2
Curriculum focus	Digital Literacy and online safety common sense education	Communication and collaboration
Computing Strand	**Information Technology**	**Digital Literacy**
Curriculum links	• use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content • select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information • use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	• select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information • use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact • understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration
Prior learning	The digital literacy content in this unit will be built upon and continue in even more depth with our **Digital Literacy and online safety** units for **Year 4**, **Year 5**, and **Year 6.**	This unit gives important lessons at the beginning of Key Stage 2 about using digital tools for communication and collaboration. The unit is placed here so that the ideas and principles learned in these lessons can be reinforced and used by the students in their learning all the way through Key Stage 2. It builds on some of the online safety messages that are covered in Key Stage 1 units **Keeping safe and exploring technology** (Year 1) and **Keep safe and create** (Year 2) about being safe when communicating with other people online.
Key vocabulary	• **Attention** - noticing someone or something as important • **Community** - people who share a common neighbourhood, background, or interests • **Concentration** - giving your full attention to a specific activity • **Credit** - giving recognition to a person that created something • **Digital footprint** - a record of what you do online, including the sites you visit and the things you share • **Distraction** - something that keeps you from giving your full attention • **Internet** - a worldwide network that connects people using computers, phones, or other devices • **Online** - using a computer, phone, or tablet to visit a website or app	• **Alter** - to change the way something looks, sometimes using a computer or other digital tools. • **Annotate** - add notes to (a text or diagram) giving explanation or comment. • **Attachment** - A digital document or file that can be attached to, and sent with an email. • **BCC** - Stands for 'Blind Carbon Copy'. A useful way to let others see an e-mail you sent without the main recipient knowing. • **CC -** Stands for 'Carbon Copy'. Typically used when a message is intended for one person, but is relevant to other people as well. • **Cloud storage** - Services such as Google Drive, OneDrive and iCloud allow users to store their files and data on internet servers, rather than on their local computers. • **Collaboration** - To work together with others. Many digital

Year 3 Computing Curriculum

	• **Permanent** - something that lasts forever • **Private** - something that you should keep to yourself • **Private information** - information about you that can be used to identify who you are • **Respect** - showing that you appreciate someone	tools now allow easy collaboration as users can work remotely on the same document or system at the same time. • **Communication** - The exchanging of information with speaking, writing or some other medium. • **Edit** - To change, add or remove elements in a piece of work (usually to improve it). • **Email** - Short for 'electronic mail', it allows you to send and receive messages to and from anyone with an email address, anywhere in the world. • **Internet** – the global collection of computer networks and their connections, all using shared protocols (TCP/IP) to communicate. • **Internet Service Provider (ISP)** - a company that lets you connect to the Internet via their system. • **Online** - using a digital device to visit a website or app that makes use of the internet. • **Packet** - A packet is a small amount of data sent over a network, such as a LAN or the Internet. • **Password** - a secret string of letters, symbols, and numbers that you can use to restrict who can access something digital • **Personal information** - information about you that cannot be used to identify you because it is also true for many other people (e.g. your hair colour or the city you live in) • **Phishing** - The sending of fraudulent emails pretending to be from reputable companies in order to get people to reveal personal information, such as passwords and credit card numbers. • **Private information** - information about you that can be used to identify you because it is unique to you (e.g. your full name or your address) • **Save** - To store a piece of work in a computer's memory so that it can be recalled at a later time. • **Server** - A server is a computer that serves up information to other computers on a network. • **Services** – programs running on computers, typically those connected to the internet, which provide functionality in response to requests; for example, to transmit a web page, deliver an email or allow a text, voice or video conversation. • **Social interaction** - talking or messaging with people to develop friendship or community. • **Spam** - Junk email or messages on a website or messaging service. • **Symbol** - a character other than a number or letter. • **Username** - a name you create to sign into a website, app, or

Year 3 Computing Curriculum

		game. • **Web browser** - A web browser, or simply "browser," is an application used to access and view websites. Common web browsers include Microsoft Edge, Google Chrome, Mozilla Firefox, and Apple's Safari. • **World Wide Web** – a service provided by computers connected to the internet (web servers), in which pages of hypertext (web pages) are transmitted to users; the pages typically include links to other web pages and may be generated by programs automatically.
Substantive concepts	• Recognise the ways in which digital devices can be distracting. • Identify how they feel when others are distracted by their devices. • Identify ideal device-free moments for themselves and others. • Recognise the kind of information that is private. • Understand that they should never give out private information online. • Learn that the information they share online leaves a digital footprint or "trail" • Explore what information is OK to be shared online • Compare and contrast how they are connected to different people and places, in person and on the internet • Demonstrate an understanding of how people can connect on the internet • Understand what online meanness can look like and how it can make people feel • Identify ways to respond to mean words online, using S-T-O-P • Explain how giving credit is a sign of respect for people's work • Learn how to give credit in their schoolwork for content they use from the internet	• Log on to an email account, open emails, create and send appropriate replies. • Recognise the effect that content in their communications may have on others. • Understand the need to keep personal information and passwords private in order to protect themselves when communicating online. • Know the school's rules for keeping safe online and be able to apply these beyond school. • log on to an email account, open emails, create and send appropriate replies. • Know and apply the school's rules for keeping safe online and be able to apply these beyond school. • Attach different files to emails, e.g. text document, sound file or image. • Open and save attachments to an appropriate place. • To understand and explain cloud storage • To upload a document to cloud storage • To log into, create and share a collaborative document or application • Understand the need for certain rules of conduct, particularly when using live forums of communication, e.g. chats, forums, live docs • To log into, create and share a collaborative document or application. • To work effectively with others on a collaborative document or application. • To understand and demonstrate respect for privacy of people's data • To work effectively with another on a collaborative document or application. • Understand the need for certain rules of conduct, particularly when using live forums of communication. • Understand how to communicate safely using video chat tools.

Year 3 Computing Curriculum

		• Understand the need for certain rules of conduct, particularly when using live forums of communication. • To work effectively with others on a collaborative document or application. • Explore the use of graphics and paint packages to design and plan an idea. •
What comes next?	The online safety content in this unit will be built upon in our **Digital Literacy and online safety** units for **Year 3**, **Year 4**, **Year 5** & **Year 6.** Students will also apply their learning around using collaborative tools in Key Stage 2 units **Databases**, **Searching the web**, **Building Collaborative websites**, **Spreadsheet masters.**	

	Spring 1	Spring 2
Curriculum focus	Animation with Scratch	Databases
Strand	**Computer Science**	**Information Technology**
Curriculum links	• design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts • use sequence, selection, and repetition in programs; work with variables and various forms of input and output • use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs	• understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration • 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
Prior learning	This unit builds on the computer science units with a coding focus from Key Stage 1: **Action algorithms** and **Programming direction** (Year 1) and **Programming with Scratch Jr** and **Programming with Logo** (Year 2). It introduces the coding language of Scratch which is the most widely used block-based coding language in the world and is a key tool that is used again in several units through Key Stage 2 and 3. New key concepts such as sequence, selection, repetition, working with variables are all introduced in this unit.	This unit builds on some of the content in the Year 2 unit Finding and Presenting Information, where students look at gathering and presenting data in graphs and charts. It also utilises skills learned in the Year 3 unit Communication and collaboration, such as using collaborative tools to gather, analyse, and present information.

Year 3 Computing Curriculum

Key vocabulary	• **Abstraction** - Removing unnecessary detail to help you solve a problem (a computational thinking concept) • **Algorithm** – an unambiguous procedure or precise step-by-step guide to solve a problem or achieve a particular objective. • **Block** – a 'chunk' of programming or a particular graphic block or piece found in a graphical programming language such as Scratch. • **Blocks Palette** – (in Scratch) – the library of blocks in most graphical programming languages. • **Command** – a step or line of programming. • **Coordinate** (noun) - Cartesian coordinates are a set of values that show an exact position. • **Costume** – The costume is the appearance of a sprite on the screen. These are usually editable. • **Debug** – to detect and correct the errors in a computer program. • **Decomposition** - Breaking a problem down into smaller parts (a computational thinking concept) • **Execute** – to follow a series of instructions. The computer or robot follows the instructions in order to complete the program. • **Input** – data provided to a computer system, such as via a keyboard, mouse, microphone, camera or physical sensors. • **Logical reasoning** – a systematic approach to solving problems or deducing information using a set of universally applicable and totally reliable rules. • **Output** – the information produced by a computer system for its user, typically on a screen, through speakers or on a printer, but possibly though the control of motors in physical systems. • **Program** – A sequence of instructions written to perform a specified task on the computer • **Repetition** (also known as **'Loop'** or **'Iteration'**) – a programming construct in which one or more instructions are repeated, perhaps a certain number of times, until a condition is satisfied or until the program is stopped. • **Script** – (In Scratch) blocks are snapped together into stacks, called scripts. When you click on a script, Scratch runs the blocks from the top of the script to the bottom. • **Selection** – 'when things happen' - A programming construct in which the instructions that are executed are determined by whether a particular condition is met. • **Sequence** – to place programming instructions in order,	• **Cloud storage** - Services such as Google Drive, OneDrive and iCloud allow users to store their files and data on internet servers, rather than on their local computers. • **Collaboration** - To work together with others. • **Data** - A structured set of numbers, representing digitised text, images, sound or video, which can be processed or transmitted by a computer. • **Database** - A database is an organised collection of data, generally stored and accessed electronically from a computer system. • **Edit** - To change, add or remove elements in a piece of work (usually to improve it). • **Evaluation** - Making judgements (a computational thinking concept) • **Export** - The opposite of importing and a computing command that usually means saving or sending a file, or part of a file, to a specific new location. • **Field** - Columns of a table in a database, or categories. For example in a database of people in an organisation you might have fields for 'name', 'address', 'phone number', 'job title' etc. • **Import** - A computing command that usually means allowing a user to bring in a file, or part of a file into another application so they can be combined. • **Rank** - A number that shows the position of something in a numerically ordered sequence. • **Record** - Every item in a database is called a 'record'. • **Save** - To store a piece of work in a computer's memory so that it can be recalled at a later time. • **Search** - To identify data that satisfies one or more conditions, such as web pages or records in a database containing keywords, or files on a computer with certain properties. • **Sort -** To arrange a set of data into a prescribed sequence.

Year 3 Computing Curriculum

	with each executed one after the other. • **Sprite** – A graphical object that can be controlled by programming. • **Stage** – (in Scratch) - the Stage is where you see your stories, games, and animations come to life.	
Substantive concepts	• Design and write a simple program for an on-screen sprite to create simple movements. • Use logical reasoning to explain how a simple algorithm works • Solve programming problems by decomposing them into smaller parts • Detect and correct errors in algorithms and programs • Create, test and improve effective control sequences. • Use conditional statements, broadcasting and sensing. • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs • Devise, test and refine effective control sequences incorporating conditional statements, broadcasting and sensing. • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. • use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and program. • Use sequence, selection, repetition in programs. • Understand and use inputs and outputs. • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and program. • Talk about how they made their program and justify the choice they made for both function and design. • Critically evaluate programs and say what they liked and what could be done to improve it. • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs	• To understand and explain what a database is • To identify records and fields of a database. • To identify advantages and disadvantages of using databases. • To select appropriate data to add to a database • To create a collaborative class database • To search and sort a database • To insert records into a database. • To insert information into fields of a database. • To look through a database to find information. Think, discuss and try different searching methods. • To make a chart from information in a database. • To be able to read and compare information on a chart. • To interpret a chart and report findings. • To compare different methods of collecting data • To understand and explain the difference between open and closed questioning • To create and use an online questionnaire for data collection • To accurately analyse and interpret database information . • To make charts from the database information. • To present information from a database.

Year 3 Computing Curriculum

What comes next?	This unit supports all of the future computer science learning that the students will experience. The learning it contains is built upon with the following units: **Animation with Scratch**, **Programming Scratch maze games**, **Building retro games - pick a project** and **LEGO robotics**, in which the programming language of Scratch is also used with a variety of different applications and opportunities to learn and practise designing, writing, editing and improving programs for specific purposes.	After this unit, the students will continue their use of online collaborative tools in Key Stage 2 units **Searching the web**, **Building Collaborative websites** and **Spreadsheet masters.** In **Spreadsheet masters** they will also deepen their knowledge and understanding of working with data in spreadsheet databases; creating charts and graphs, using formulas, sorting and adding conditional formatting to data.

	Summer 1	Summer 2
Curriculum focus	Digital Imagery: Patterns in nature	Getting Started with Kodu
Strand	**Information Technology**	**Computer Science**
Curriculum links	select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information	• design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts • use sequence, selection, and repetition in programs; work with variables and various forms of input and output • use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
Prior learning	This unit builds on the digital design work that students cover in Key Stage 1. In **An introduction to digital art** (Year 1), students learn about a wide range of digital drawing and painting tools, such as different brushes and effects, shape and line drawing tools and the flood fill tool. They also apply some of these tools and skills in **Making multimedia stories** (Year 1), **Writing in different styles** and **Keep safe and create** (both Year 2).	• This unit builds on the computer science units with a coding focus from Key Stage 1: **Action algorithms** and **Programming direction** (Year 1) and **Programming with Scratch Jr** and **Programming with Logo** (Year 2). • It introduces the coding language of Kodu Game Lab and covers concepts such as sequence, selection and working with variables.
Key vocabulary	• **Alter** - to change the way something looks, sometimes using a computer or other digital tools. • **Attribute** - giving credit to the person who created something, such such as listing the author's name and date, or a citation. • **Copyright** - legal protection that a creators have over the things they create. • **Digital content** – any media created, edited or viewed on a	• **Algorithm** – an unambiguous procedure or precise step-by-step guide to solve a problem or achieve a particular objective. A set of instructions for achieving a goal or solving a problem. • **Block** – a 'chunk' of programming or a particular graphic block or piece found in a graphical programming language such as Scratch or Kodu. • **Command** – a step or line of programming. • **Debug** – to detect and correct the errors in a computer

Year 3 Computing Curriculum

	computer, such as text (including the hypertext of a web page), images, sound, video (including animation), or virtual environments, and combinations of these (i.e. multimedia). • **Edit -** To change, add or remove elements in a piece of work (usually to improve it). • **Evaluation** - Making judgements. • **Export -** The opposite of importing and a computing command that usually means saving or sending a file, or part of a file, to a specific new location. • **Hue** - A colour or shade. • **Intellectual property** - the ownership of something you create, giving you a right to how others use it. • **Import -** A computing command that usually means allowing a user to bring in a file, or part of a file into another application so they can be combined. • **Layer -** In sound, photo or video editing terminology, layering is the stacking of media elements on top of each other, or in a project timeline to enable a view or playback of multiple elements simultaneously. • **Photo retouching** - digital alteration of a photo to enhance the way someone looks (removing of wrinkles, clearing of skin, changing their body, etc). • **Saturation** - The intensity of a colour, how strong or washed out it is. • **Save -** To store a piece of work in a computer's memory so that it can be recalled at a later time. • **Search** – to identify data that satisfies one or more conditions, such as web pages containing supplied keywords, or files on a computer with certain properties. • **Software** – computer programs, including both application software (such as office programs, web browsers, media editors and games) and the computer operating system. • **Web browser** - A web browser, or simply "browser," is an application used to access and view websites.	program. • **Decomposition** - Breaking a problem down into smaller parts (a computational thinking concept) • **Execute** – to follow a series of instructions. The computer or robot follows the instructions in order to complete the program. • **Input** – data provided to a computer system, such as via a keyboard, mouse, microphone, camera or physical sensors. Information which is received by the computer from a keyboard, mouse or sensor e.g. pressing the left mouse button or space bar creates an input. • **Logical reasoning** – a systematic approach to solving problems or deducing information using a set of universally applicable and totally reliable rules. • **Output** – the information produced by a computer system for its user, typically on a screen, through speakers or on a printer, but possibly though the control of motors in physical systems. Also an action performed by the computer e.g. switching on a light, moving a turtle or sprite across the screen. • **Program** – A sequence of instructions written to perform a specified task on the computer • **Selection** – 'when things happen' - A programming construct in which the instructions that are executed are determined by whether a particular condition is met. • **Sequence** – to place programming instructions in order, with each executed one after the other. • **Sprite** – A graphical object that can be controlled by programming. • **Variables** – a way in which computer programs can store, retrieve or change simple data, such as a score, the time left, or the user's name.
Substantive concepts	• Acquire, store and retrieve images from cameras, scanners or the Internet for a purpose. • Understand the need for caution when using the Internet to search for images and what to do if they find unsuitable images (See school's Acceptable Use Policy/AUP) • Create images using a range of techniques to develop a particular style. • Acquire, store and retrieve images from cameras, scanners or the Internet for a purpose.	• Create and refine sequences of commands to make a character move • Use logical reasoning to debug algorithm • Plan and design a 3D game environment • Create and refine sequences of commands to make a character move • Use logical reasoning to debug algorithms • Design programs with sequence and selection that accomplish

Year 3 Computing Curriculum

	• Understand the need for caution when using the Internet to search for images and what to do if they find unsuitable images (See school's Acceptable Use Policy/AUP) • Create images using a range of techniques to develop a particular style. • Compare and contrast different art software or web-based tools. • Use a lasso tool to select specific areas of an image. • Use effects in photo-manipulation software to edit, change or enhance an image. • Independently download and save images or video onto a computer. • Independently upload images or video for use in editing software. • Use a lasso tool to select specific areas of an image. • Be able to resize various elements in a graphics or paint package. • Use effects in photo-manipulation software to edit, change or enhance an image. • Combine a number of images using layering. • Import music, stills or video into video editing software for a specific project. • Arrange, trim and cut clips to create a short film that conveys meaning. • Add simple titles, credits and special effects.	specific goals • Use logical reasoning to debug algorithms • Evaluate a program that they have created and say what they liked and what could be done to improve it • Plan and design a 3D game environment • Create and refine sequences of commands to make a character move • Use logical reasoning to debug algorithms • Plan and design a 3D game environment • Create and refine sequences of commands to make a character move • Use logical reasoning to debug algorithms • Evaluate a program that they have created and say what they liked and what could be done to improve it • Make improvements to a game based on feedback
What comes next?	The photo editing skills learned in this unit are revisited and extended in our Year 6 unit **Manipulating Images**. Here they also experiment with 3D digital sculpture and combine this with photo editing techniques. Other digital design skills are explored in **3D Design** where the focus is more on architectural style drawing and design. Students will also broaden their creative digital skills using sound and video in **Manipulating Sound** and **Creating Instructional videos**. Some of our coding units also make use of digital art and design skills as children design elements of objects or backgrounds in their projects.	The learning in this unit is built upon in our **Kodu - An independent project** unit of work, which, as the name suggests, aims to open to all the possibilities of Kodu game lab to the students so they can plan, design, test and code their own game, while making use of some of the more advanced features of the software. These other Key Stage 2 units provide the opportunity to broaden their experience of using other programming languages, and the knowledge and understanding of programming concepts required at Key Stage 2: **Animation with Scratch**, **Programming Scratch maze games**, **Building retro games - pick a project**. **Getting started with the BBC micro:bit**, **LEGO robotics** and **Getting started with Crumble** also provide opportunities to program and control physical systems.