Computing

A high-quality computing education equips pupils to use **computational thinking and creativity to understand and change the world**. Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content. **Computing also ensures that pupils become digitally literate – able to use, and express themselves and develop their ideas through information and communication technology – at a level suitable for the future workplace and as active participants in a digital world.**

Subject content

Key stage 1

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 unambiguous instructions
- create and debug simple programs
- use logical reasoning to predict the behaviour of simple programs
- use technology purposefully to create, organise, store, manipulate and retrieve digital content
- recognise common uses of information technology beyond school
- use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.

Key stage 2

Pupils should be taught to:

- 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
- 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.

EYFS	Awareness of different technologies in and out of school · Awareness of the cause and effect of technology · Awareness of digital storage of information- photography, digital writing and research information · Awareness of input and outputs of devices · Can use technology to express creatively and constructively	Awareness of the cause and effect of technology · Awareness of digital storage of information- photography, digital writing and research information · Awareness of input and outputs of devices · Can use technology to express creatively and constructively	· Awareness of different technologies in and out of school · Awareness of the cause and effect of technology · Awareness of digital storage of information- photography, digital writing and research information · Awareness of input and outputs of devices · Can use technology to express creatively and constructively

Year 1	Unit of Study	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Autumn 1	**Online Safety** This is the first of online safety units and is aimed at teaching basic online safety and digital literacy skills. In this unit, children learn about the potential dangers in the online world and what basic steps we all need to take in order to have positive digital experiences. The first lesson, which is intended to be taught at the start of the school year, focuses on why it is important for children to name their creative work. They go on to learn about using a search engine safely to find pictures. Children learn the SMART rules and look at what information should be kept safe when using the Internet. The lessons then explore the positives and potential negatives of online communication, such as email, and children will develop the skills to recognise potential dangers and act accordingly to keep themselves and others safe.	Catch up and classroom discussions	To create, name and date my digital creative work. ● I can give my work a filename that shows it is my work. ● I can say why it is important to name and date my work. ● I can begin to decide what needs copyright.	To safely search for images online. ● I can select and use Safe Search filters. ● I can type words to find an image online. ● I know to speak to a trusted adult if I see, hear or read something online that upsets me	To understand how to communicate safely online. ● I can explain what each letter of SMART stands for. ● I can spot when something online might not be safe. ● I can make links between the offline and online world.	To understand what personal information I need to keep safe. ● I can talk about my own personal information. ● I can recognise what personal information can affect my safety. ● I know who to tell if someone asks for my personal information	To explore how to use email to safely communicate. ● I can say why email is a good way of communicating ● I can suggest ways to use email safely. ● I can guide others to make safe choices online.	To apply my online safety knowledge to help others make good choices online. ● I can recognise potential dangers online. ● I can use my online safety knowledge to decide what to do in different situations. ● I can guide others to make safe choices online.
Autumn 2	**Digital Design** Learners will develop their understanding of a range of tools used for digital painting. They then use these tools to create their own digital paintings, while gaining inspiration from a range of artists' work. The unit concludes with learners considering their preferences when painting with and without the use of digital devices.	To describe what different freehand tools do ● I can make marks on a screen and explain which tools I used ● I can draw lines on a screen and explain which tools I used ● I can use the paint tools to draw a picture	To use the shape tool and the line tools ● I can make marks with the square and line tools ● I can use the shape and line tools effectively ● I can use the shape and line tools to recreate the work of an artist	To make careful choices when painting a digital picture ● I can choose appropriate shapes ● I can make appropriate colour choices ● I can create a picture in the style of an artist	To explain why I chose the tools I used ● I can explain that different paint tools do different jobs ● I can choose appropriate paint tools and colours to recreate the work of an artist ● I can say which tools were helpful and why	To use a computer on my own to paint a picture ● I can make dots of colour on the page ● I can change the colour and brush sizes ● I can use dots of colour to create a picture in the style of an artist on my own	To compare painting a picture on a computer and on paper ● I can explain that pictures can be made in lots of different ways ● I can spot the differences between painting on a computer and on paper ● I can say whether I prefer painting using a computer or using paper	
Spring 1	**Programming A – Moving a robot** This unit introduces learners to early programming concepts. Learners will explore using individual commands, both with other learners 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	To explain what a given command will do ● I can predict the outcome of a command on a device ● I can match a command to an outcome ● I can run a command on a device	To act out a given word ● I can follow an instruction ● I can recall words that can be acted out ● I can give directions	To combine 'forwards' and 'backwards' commands to make a sequence ● I can compare forward and backward movements ● I can start a sequence from the same place ● I can predict the outcome of a sequence	To combine four direction commands to make sequences ● I can compare left and right turns ● I can experiment with 'turn' and 'move' commands to move a robot	To plan a simple program ● I can explain what my program should do ● I can choose the order of commands in a sequence ● I can debug my program	To find more than one solution to a problem ● I can identify several possible solutions ● I can plan two programs ● I can use two different programs to get to the same place	

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Spring 2	Data and Information – Grouping data 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.	To label objects ● I can describe objects using labels ● I can match objects to groups ● I can identify the label for a group of objects	To identify that objects can be counted ● I can count objects ● I can group objects ● I can count a group of objects	To describe objects in different ways ● I can describe an object ● I can describe a property of an object ● I can find objects with similar properties	To count objects with the same properties ● I can group similar objects ● I can group objects in more than one way ● I can count how many objects share a property	To compare groups of objects ● I can choose how to group objects ● I can describe groups of objects ● I can record how many objects are in a group	To answer questions about groups of objects ● I can decide how to group objects to answer a question ● I can compare groups of objects ● I can record and share what I have found	
Summer 1	Creating Media Learners will develop their understanding of the various aspects of using a computer to create and manipulate text. They will become more familiar with using a keyboard and mouse to enter and remove text. Learners will also consider how to change the look of their text, and will be able to justify their reasoning in making these changes. Finally, learners will consider the differences between using a computer to create text, and writing text on paper. They will be able to explain which method they prefer and explain their reasoning for choosing this.	To use a computer to write ● I can open a word processor ● I can recognise keys on a keyboard ● I can identify and find keys on a keyboard	To add and remove text on a computer ● I can enter text into a computer ● I can use letter, number, and Space keys ● I can use Backspace to remove text	To identify that the look of text can be changed on a computer ● I can type capital letters ● I can explain what the keys that I have already learnt about do ● I can identify the toolbar and use bold, italic, and underline	To make careful choices when changing text ● I can select a word by double-clicking ● I can select all of the text by clicking and dragging ● I can change the font	To explain why I used the tools that I chose ● I can say what tool I used to change the text ● I can decide if my changes have improved my writing ● I can use 'Undo' to remove changes	To compare typing on a computer to writing on paper ● I can make changes to text on a computer ● I can explain the differences between typing and writing ● I can say why I prefer typing or writing	
Summer 2	Programming B - Programming animations This unit introduces learners to on-screen programming through ScratchJr. Learners will explore the way a project looks by investigating sprites and backgrounds. They will use programming blocks to use, modify, and create programs. Learners will also be introduced to the early stages of program design through the introduction of algorithms.	To choose a command for a given purpose ● I can find the commands to move a sprite ● I can use commands to move a sprite ● I can compare different programming tools	To show that a series of commands can be joined together ● I can use more than one block by joining them together ● I can use a **Start** block in a program ● I can run my program	To identify the effect of changing a value ● I can find blocks that have numbers ● I can change the value ● I can say what happens when I change a value	To explain that each sprite has its own instructions ● I can show that a project can include more than one sprite ● I can delete a sprite ● I can add blocks to each of my sprites	To design the parts of a project ● I can choose appropriate artwork for my project ● I can decide how each sprite will move ● I can create an algorithm for each sprite	To use my algorithm to create a program ● I can use sprites that match my design ● I can add programming blocks based on my algorithm ● I can test the programs I have created	

Year 2	Unit of Study	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Autumn 1	Online Safety In this unit, children learn about how what they do online leaves a trail called a digital footprint. They will look at how to improve the efficiency of their online searches, the types of websites that are best for children to access when looking for information, as well as how to identify inappropriate content and the actions they should take if they do. Children will be introduced to the term 'cyberbullying' and look at how they should communicate online and deal with instances of people being unkind via digital means.	Catch up and classroom discussions	To understand that the information I put online leaves digital footprint. ● I can explain what 'digital footprint' means. ● I can explain how people might use the information I put online. ● I can explain how a digital footprint contains information about a person.	To use keywords in an online search to find key information about a topic. ● I can identify which keywords will give me good results. ● I can use a website to search for information.	To recognise whether a website is appropriate for children. ● I can identify websites that are suitable for my age. ● I can identify when to ask an adult for advice about accessing a website. ● I know what to do if a website makes me uncomfortable in any way.	To rate and review informative websites. ● I can discuss what people might want to know about a website to decide whether it is useful or not. ● I can explain what I like or dislike about a website. ● I can use clues to decide who a website is aimed at.	To be able to identify kind and unkind behaviour online. ● I can identify unkind online behaviour ● I know what to do if I think someone is being unkind to me online.	To apply knowledge of safe and sensible online activities to different situations ● I can choose a sensible course of action if I feel uncomfortable online. ● I can explain how to safely search for information online. ● I can choose appropriate websites for someone my age.
Autumn 2	Digital photography Unit introduction Learners 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.	To use a digital device to take a photograph ● I can recognise what devices can be used to take photographs ● I can talk about how to take a photograph ● I can explain what I did to capture a digital photo	To make choices when taking a photograph ● I can explain the process of taking a good photograph ● I can take photos in both landscape and portrait format ● I can explain why a photo looks better in portrait or landscape format	To describe what makes a good photograph ● I can identify what is wrong with a photograph ● I can discuss how to take a good photograph ● I can improve a photograph by retaking it	To decide how photographs can be improved ● I can explore the effect that light has on a photo ● I can experiment with different light sources ● I can explain why a picture may be unclear	To use tools to change an image ● I can recognise that images can be changed ● I can use a tool to achieve a desired effect ● I can explain my choices	To recognise that photos can be changed ● I can apply a range of photography skills to capture a photo ● I can recognise which photos have been changed ● I can identify which photos are real and which have been changed	

Spring 1	Programming A – Robot algorithms Unit introduction This unit develops learners' understanding of instructions in sequences and the use of logical reasoning to predict outcomes. Learners 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.	To describe a series of instructions as a sequence ● I can follow instructions given by someone else ● I can choose a series of words that can be acted out as a sequence I can give clear instructions	To explain what happens when we change the order of instructions ● I can use the same instructions to create different algorithms ● I can use an algorithm to program a sequence on a floor robot ● I can show the difference in outcomes between two sequences that consist of the same instructions	To use logical reasoning to predict the outcome of a program ● I can follow a sequence ● I can predict the outcome of a sequence I can compare my prediction to the program outcome	To explain that programming projects can have code and artwork ● I can explain the choices that I made for my mat design ● I can identify different routes around my mat ● I can test my mat to make sure that it is usable	To design an algorithm ● I can explain what my algorithm should achieve ● I can create an algorithm to meet my goal ● I can use my algorithm to create a program	To create and debug a program that I have written ● I can test and debug each part of the program ● I can plan algorithms for different parts of a task ● I can put together the different parts of my program	
Spring 2	Unit introduction - Pictograms Learners will begin to understand what the term data means and how data can be collected in the form of a tally chart. They will learn the term 'attribute' and use this to help them organise data. They will then progress onto presenting data in the form of pictograms and finally block diagrams. Learners will use the data presented to answer questions.	To recognise that we can count and compare objects using tally charts ● I can record data in a tally chart ● I can represent a tally count as a total ● I can compare totals in a tally chart	To recognise that objects can be represented as pictures ● I can enter data onto a computer ● I can use a computer to view data in a different format ● I can use pictograms to answer simple questions about objects	To create a pictogram ● I can organise data in a tally chart ● I can use a tally chart to create a pictogram ● I can explain what the pictogram shows	To select objects by attribute and make comparisons ● I can tally objects using a common attribute ● I can create a pictogram to arrange objects by an attribute ● I can answer 'more than'/'less than' and 'most/least' questions about an attribute	To recognise that people can be described by attributes ● I can choose a suitable attribute to compare people ● I can collect the data I need ● I can create a pictogram and draw conclusions from it	To explain that we can present information using a computer ● I can use a computer program to present information in different ways ● I can share what I have found out using a computer ● I can give simple examples of why information should not be shared	
Summer 1	Digital Music In this unit, learners will be using a computer to create music. They will listen to a variety of pieces of music and consider how music can make them think and feel. Learners will compare creating music digitally and non-digitally. Learners will look at patterns and purposefully create music.	To say how music can make us feel ● I can identify simple differences in pieces of music ● I can describe music using adjectives ● I can say what I do and don't like about a piece of music	To identify that there are patterns in music ● I can create a rhythm pattern ● I can play an instrument following a rhythm pattern ● I can explain that music is created and played by humans	To experiment with sound using a computer ● I can connect images with sounds ● I can use a computer to experiment with pitch ● I can relate an idea to a piece of music	To use a computer to create a musical pattern ● I can identify that music is a sequence of notes ● I can explain how my music can be played in different ways ● I can refine my musical pattern on a computer	To create music for a purpose ● I can create a rhythm which represents an animal I've chosen ● I can create my animal's rhythm on a computer ● I can add a sequence of notes to my rhythm	To review and refine our computer work ● I can review my work ● I can explain how I changed my work ● I can listen to music and describe how it makes me feel	

Summer 2	Programming B - Programming animations This unit initially recaps on learning from the Year 1 Scratch Junior unit 'Programming B - Programming animations'. Learners 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.	To explain that a sequence of commands has a start ● I can identify the start of a sequence ● I can identify that a program needs to be started ● I can show how to run my program	To explain that a sequence of commands has an outcome ● I can predict the outcome of a sequence of commands ● I can match two sequences with the same outcome I can change the outcome of a sequence of commands	To create a program using a given design ● I can work out the actions of a sprite in an algorithm ● I can decide which blocks to use to meet the design ● I can build the sequences of blocks I need	To change a given design ● I can choose backgrounds for the design ● I can choose characters for the design ● I can create a program based on the new design	To create a program using my own design ● I can choose the images for my own design ● I can create an algorithm ● I can build sequences of blocks to match my design	To decide how my project can be improved ● I can compare my project to my design ● I can improve my project by adding features ● I can debug my program	

Year 3	Unit of Study	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Autumn 1	Online Safety In this unit, children are introduced to email and other forms of online communication. They will look at how to write and send emails, as well as how to decide if an email is safe to open. They will build on their existing knowledge of cyberbullying and how to deal with unkind behaviour online. The use and importance of privacy settings is introduced and children will discuss the types of information we should not share online. They will build on the idea of a digital footprint by thinking about how the adverts they see online are targeted at them. Children will finish the unit by using the knowledge they have gained to plan a party using online communication methods.	Catch up and classroom discussions	To know what cyberbullying is and how to address it. ● I can recognise cyberbullying. ● I can identify a safe person to tell if I encounter cyberbullying. ● I know that cyberbullying can happen via a range of devices.	To understand how websites use advertisements to promote products. ● I can identify adverts online. ● I can identify a targeted advert. ● I can explore how companies use websites to promote products.	To create strong passwords and understand privacy settings. ● I can create a strong password. ● I can explain why a strong password is important. ● I can explain what privacy settings are.	To safely send and receive emails. ● I can discuss email as a form of communication. ● I can identify an email that I should not open. ● I know how to safely receive an email.	To explore different ways children can communicate online. ● I can identify online communities I am a part of. ● I can discuss the positive and negative aspects of online communication ● I can discuss the differences between communication in real life and online	To use knowledge about online safety to plan a part online. ● I can discuss what I have learnt about online safety ● I can communicate my ideas with a group clearly and listen to others' contributions. ● I can use what I know about online safety to plan a party using online methods.
Autumn 2	Stop-frame animation Unit introduction **Learners will use a range of techniques to create a stop-frame animation using tablets. Next, they will apply those skills to create a**	To explain that animation is a sequence of drawings or photographs ● I can draw a sequence of pictures ● I can create an effective flip book—style animation	To relate animated movement with a sequence of images ● I can predict what an animation will look like ● I can explain why little changes are needed for each frame	To plan an animation ● I can break down a story into settings, characters and events ● I can describe an animation that is achievable on screen ● I can create a storyboard	To identify the need to work consistently and carefully ● I can use onion skinning to help me make small changes between frames ● I can review a sequence of frames to check my work	To review and improve an animation ● I can explain ways to make my animation better ● I can evaluate another learner's animation	To evaluate the impact of adding other media to an animation ● I can add other media to my animation ● I can explain why I added other media to my animation	

	story-based animation. This unit will conclude with learners adding other types of media to their animation, such as music and text.	● I can explain how an animation/flip book works	● I can create an effective stop-frame animation		● I can evaluate the quality of my animation	● I can improve my animation based on feedback	● I can evaluate my final film	
Spring 1	Programming A - Sequencing sounds **Unit introduction** 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 learners. 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. Learners also apply stages of program design through this unit.	To explore a new programming environment ● I can identify the objects in a Scratch project (sprites, backdrops) ● I can explain that objects in Scratch have attributes (linked to) ● I can recognise that commands in Scratch are represented as blocks	To identify that commands have an outcome ● I can identify that each sprite is controlled by the commands I choose ● I can choose a word which describes an on-screen action for my plan ● I can create a program following a design	To explain that a program has a start ● I can start a program in different ways ● I can create a sequence of connected commands ● I can explain that the objects in my project will respond exactly to the code To recognise that a sequence of commands can have an order ● I can explain what a sequence is ● I can combine sound commands ● I can order notes into a sequence	To recognise that a sequence of commands can have an order ● I can explain what a sequence is ● I can combine sound commands ● I can order notes into a sequence	To change the appearance of my project ● I can build a sequence of commands ● I can decide the actions for each sprite in a program ● I can make design choices for my artwork	To create a project from a task description ● I can identify and name the objects I will need for a project ● I can relate a task description to a design ● I can implement my algorithm as code	
Spring 2	Data and information – Branching databases Learners 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. Learners 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	To create questions with yes/no answers ● I can investigate questions with yes/no answers ● I can make up a yes/no question about a collection of objects ● I can create two groups of objects separated by one attribute	To identify the attributes needed to collect data about an object ● I can select an attribute to separate objects into groups ● I can create a group of objects within an existing group ● I can arrange objects into a tree structure	To create a branching database ● I can select objects to arrange in a branching database ● I can group objects using my own yes/no questions ● I can test my branching database to see if it works	To explain why it is helpful for a database to be well structured ● I can create yes/no questions using given attributes ● I can compare two branching database structures ● I can explain that questions need to be ordered carefully to split objects into similarly sized groups	To plan the structure of a branching database ● I can independently create questions to use in a branching database ● I can create questions that will enable objects to be uniquely identified ● I can create a physical version of a branching database	To independently create an identification tool ● I can create a branching database that reflects my plan ● I can work with a partner to test my identification tool ● I can suggest real-world uses for branching databases	

Summer 1	Creating Media During this unit, learners 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. Learners 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. Learners 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.	To recognise how text and images convey information ● I can explain the difference between text and images ● I can recognise that text and images can communicate messages clearly ● I can identify the advantages and disadvantages of using text and images	To recognise that text and layout can be edited ● I can change font style, size, and colours for a given purpose ● I can edit text ● I can explain that text can be changed to communicate more clearly	To choose appropriate page settings ● I can explain what 'page orientation' means ● I can recognise placeholders and say why they are important ● I can create a template for a particular purpose	To add content to a desktop publishing publication ● I can choose the best locations for my content ● I can paste text and images to create a magazine cover ● I can make changes to content after I've added it	To consider how different layouts can suit different purposes ● I can identify different layouts ● I can match a layout to a purpose ● I can choose a suitable layout for a given purpose	To consider the benefits of desktop publishing ● I can identify the uses of desktop publishing in the real world ● I can say why desktop publishing might be helpful ● I can compare work made on desktop publishing to work created by hand	
Summer 2	Programming B – Events and actions in programs This unit explores the links between events and actions, while consolidating prior learning relating to sequencing. Learners begin by moving a sprite in four directions (up, down, left, and right). They 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. Learners 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.	To explain how a sprite moves in an existing project ● I can explain the relationship between an event and an action ● I can choose which keys to use for actions and explain my choices ● I can identify a way to improve a program	To create a program to move a sprite in four directions ● I can choose a character for my project ● I can choose a suitable size for a character in a maze ● I can program movement	To adapt a program to a new context ● I can use a programming extension ● I can consider the real world when making design choices ● I can choose blocks to set up my program	To develop my program by adding features ● I can identify additional features (from a given set of blocks) ● I can choose suitable keys to turn on additional features ● I can build more sequences of commands to make my design work	To identify and fix bugs in a program ● I can test a program against a given design ● I can match a piece of code to an outcome ● I can modify a program using a design	To design and create a maze-based challenge ● I can make design choices and justify them ● I can implement my design ● I can evaluate my project	

Year 4	Unit of Study	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Autumn 1	Online Safety In this unit, children learn about preventing and dealing with cyberbullying; how to use search engines efficiently; how to avoid plagiarism online; and how to be a good digital citizen. The unit ends with children applying their new knowledge to design a character to be displayed around school to promote online safety	Catch up and classroom discussions	I can identify how a message can hurt someone's feelings. ● I can explain why other people may be hurt by messages or comments. ● I can edit my own messages and comments to make sure I am not being unkind ● I know how to respond to a hurtful message or comment online.	I can use a search engine accurately. ● can access a trusted search engine ● I can use strategies which improve my results when searching online. ● I can choose an appropriate number of words to include in my searches.	I understand the term 'plagiarism' and how to avoid it. ● I can explain what a citation is. ● I can write a citation. ● I can explain why plagiarism is harmful.	To create a safe online profile ● I can identify the information that I shouldn't share online. ● I know why it is dangerous to share certain information. ● I understand why some websites ask for registration information.	To explain how to be a responsible digital citizen. ● I can explain what digital citizenship is. ● I can explain how to be a good citizen in real life and online.	To create an online safety superhero character ● I can design a character that represents at least one aspect of online safety. ● I can use what I have learned about online safety to explain what behaviour my superhero will look for ● I can apply what I have learned to write a 'top tip' for online safety.
Autumn 2	Creating Media – Audio production Learners will identify the input device (microphone) and output devices (speaker or headphones) required to work with sound digitally. Learners 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, learners will evaluate their work and give feedback to their peers.	To identify that sound can be recorded ● I can identify the input and output devices used to record and play sound ● I can use a computer to record audio ● I can explain that the person who records the sound can say who is allowed to use it	To explain that audio recordings can be edited ● I can re-record my voice to improve my recording ● I can inspect the soundwave view to know where to trim my recording ● I can discuss what sounds can be added to a podcast	To recognise the different parts of creating a podcast project ● I can explain how sounds can be combined to make a podcast more engaging ● I can save my project so the different parts remain editable ● I can plan appropriate content for a podcast	To apply audio editing skills independently ● I can record content following my plan ● I can review the quality of my recordings ● I can improve my voice recordings	To combine audio to enhance my podcast project ● I can open my project to continue working on it ● I can arrange multiple sounds to create the effect I want ● I can explain the difference between saving a project and exporting an audio file	To evaluate the effective use of audio ● I can listen to an audio recording to identify its strengths ● I can suggest improvements to an audio recording ● I can choose appropriate edits to improve my podcast	
Spring 1	Repetition in Shapes Learners will create programs by planning, modifying, and testing commands to create shapes and patterns. They will use Logo, a text-based programming language. This unit is the first of the two programming units in Year 4, and looks at repetition and loops within programming	To identify that accuracy in programming is important ● I can program a computer by typing commands ● I can explain the effect of changing a value of a command ● I can create a code snippet for a given purpose	To create a program in a text-based language ● I can use a template to draw what I want my program to do ● I can write an algorithm to produce a given outcome ● I can test my algorithm in a text-based language	To explain what 'repeat' means ● I can identify repetition in everyday tasks ● I can identify patterns in a sequence ● I can use a count-controlled loop to produce a given outcome	To modify a count-controlled loop to produce a given outcome ● I can identify the effect of changing the number of times a task is repeated ● I can predict the outcome of a program containing a count-controlled loop ● I can choose which values to change in a loop	To decompose a task into small steps ● I can identify 'chunks' of actions in the real world ● I can use a procedure in a program ● I can explain that a computer can repeatedly call a procedure	To create a program that uses count-controlled loops to produce a given outcome ● I can design a program that includes count-controlled loops ● I can make use of my design to write a program ● I can develop my program by debugging it	

Spring 2	Data Information – Data logging 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 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.	To explain that data gathered over time can be used to answer questions • I can choose a data set to answer a given question • I can suggest questions that can be answered using a given data set • I can identify data that can be gathered over time	To use a digital device to collect data automatically • I can explain what data can be collected using sensors • I can use data from a sensor to answer a given question • I can identify that data from sensors can be recorded	To explain that a data logger collects 'data points' from sensors over time • I can recognise that a data logger collects data at given points • I can identify the intervals used to collect data • I can talk about the data that I have captured	To recognise how a computer can help us analyse data • I can view data at different levels of detail • I can sort data to find information • I can explain that there are different ways to view data	To identify the data needed to answer questions • I can propose a question that can be answered using logged data • I can plan how to collect data using a data logger • I can use a data logger to collect data	To use data from sensors to answer questions • I can interpret data that has been collected using a data logger • I can draw conclusions from the data that I have collected • I can explain the benefits of using a data logger	
Summer 1	Creating Media – Photo editing Learners 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.	To explain that the composition of digital images can be changed • I can improve an image by rotating it • I can explain why I might crop an image • I can use photo editing software to crop an image	To explain that colours can be changed in digital images • I can explain that different colour effects make you think and feel different things • I can experiment with different colour effects • I can explain why I chose certain colour effects	To explain how cloning can be used in photo editing • I can add to the composition of an image by cloning • I can identify how a photo edit can be improved • I can remove parts of an image using cloning	To explain that images can be combined • I can experiment with tools to select and copy part of an image • I can use a range of tools to copy between images • I can explain why photos might be edited	To combine images for a purpose • I can describe the image I want to create • I can choose suitable images for my project • I can create a project that is a combination of other images	To evaluate how changes can improve an image • I can review images against a given criteria • I can use feedback to guide making changes • I can combine text and my image to complete the project	
Summer 2	Repetition in Games Learners will explore the concept of repetition in programming using the Scratch environment. The unit begins with a Scratch activity similar to that carried out in Logo in Programming unit A, where learners can discover similarities between two environments. Learners 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.	To develop the use of count-controlled loops in a different programming environment • I can list an everyday task as a set of instructions including repetition • I can predict the outcome of a snippet of code • I can modify a snippet of code to create a given outcome	To explain that in programming there are infinite loops and count-controlled loops • I can modify loops to produce a given outcome • I can choose when to use a count-controlled loop and an infinite loop • I can recognise that some programming languages enable more than one process to be run at once	To develop a design that includes two or more loops which run at the same time • I can choose which action will be repeated for each object • I can explain what the outcome of the repeated action should be • I can evaluate the effectiveness of the repeated sequences used in my program	To modify an infinite loop in a given program • I can identify which parts of a loop can be changed • I can explain the effect of my changes • I can re-use existing code snippets on new sprites	To design a project that includes repetition • I can evaluate the use of repetition in a project • I can select key parts of a given project to use in my own design • I can develop my own design explaining what my project will do	To create a project that includes repetition • I can refine the algorithm in my design • I can build a program that follows my design • I can evaluate the steps I followed when building my project	

Year 5	Unit of Study	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Autumn 1	**Online Safety** In this unit, children will learn about email safety with a focus on preventing and dealing with spam. They will consider the importance of strong passwords and learn how to create them. Children will build on their knowledge of plagiarism and fair use of people's work by learning how to write citations and references for websites they may use. They will scrutinise photographs that they see online and learn how easy it is to manipulate pictures and present them as reality.	Catch up and classroom discussions	To identify spam emails and what to do with them. ● I can look at the sender and subject to spot a spam email. ● I know what to do with spam email. ● I can take steps to avoid receiving spam.	To write citations for websites I use for research. ● I can explain why it is important to cite a source. ● I can cite a website. ● I can follow a citation to access an online source.	To create strong passwords. ● I can explain the rules for creating a strong password. ● I can create a strong password using a set of rules. ● I can explain why having a strong password is important.	To recognise when, why and how photographs we see online may have been edited. ● I can recognise changes that have been made to an original photograph. ● I understand that not everything I see online is true. ● I can explain how false photographs can make people feel bad about themselves.	To apply online safety rules to real-life scenarios ● I can explain how to stay safe online. ● I can give an example of unsafe online behaviour and the possible consequences. ● I can explain how to apply online safety rules to a given scenario.	To apply online safety rules to real-life scenarios. ● I can explain how to stay safe online. ● I can give an example of unsafe online behaviour and the possible consequences. ● I can explain how to apply online safety rules to a given scenario
Autumn 2	**Creating Media – Video production** Learners will learn how to create short videos by working in pairs or 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. Learners are guided with step-by-step support to take their idea from conception to completion. At the conclusion of the unit, learners have the opportunity to reflect on and assess their progress in creating a video.	To explain what makes a video effective ● I can explain that video is a visual media format ● I can identify features of videos ● I can compare features in different videos	To use a digital device to record video ● I can identify and find features on a digital video recording device ● I can experiment with different camera angles ● I can make use of a microphone	To capture video using a range of techniques ● I can suggest filming techniques for a given purpose ● I can capture video using a range of filming techniques ● I can review how effective my video is	To create a storyboard ● I can outline the scenes of my video ● I can decide which filming techniques I will use ● I can create and save video content	To identify that video can be improved through reshooting and editing ● I can store, retrieve, and export my recording to a computer ● I can explain how to improve a video by reshooting and editing ● I can select the correct tools to make edits to my video	To consider the impact of the choices made when making and sharing a video ● I can make edits to my video and improve the final outcome ● I can recognise that my choices when making a video will impact the quality of the final outcome ● I can evaluate my video and share my opinions	
Spring 1	**Programming A – Selection in physical programming** In this unit, learners will use physical computing to explore the concept of selection in programming through the use of the Crumble programming environment. Learners will be introduced to a microcontroller (Crumble controller) and learn how to connect and program it to control components (including output devices — LEDs and motors). Learners will be introduced to conditions as a means of controlling the flow of actions in a program. Learners will make use of their knowledge of	To control a simple circuit connected to a computer ● I can create a simple circuit and connect it to a microcontroller ● I can program a microcontroller to make an LED switch on ● I can explain what an infinite loop does	To write a program that includes count-controlled loops ● I can connect more than one output component to a microcontroller ● I can use a count-controlled loop to control outputs ● I can design sequences that use count-controlled loops	To explain that a loop can stop when a condition is met ● I can explain that a condition is either true or false ● I can design a conditional loop ● I can program a microcontroller to respond to an input	To explain that a loop can be used to repeatedly check whether a condition has been met ● I can explain that a condition being met can start an action ● I can identify a condition and an action in my project ● I can use selection (an 'if...then...' statement) to direct the flow of a program	To design a physical project that includes selection ● I can identify a real-world example of a condition starting an action ● I can describe what my project will do ● I can create a detailed drawing of my project	To create a program that controls a physical computing project ● I can write an algorithm that describes what my model will do ● I can use selection to produce an intended outcome ● I can test and debug my project	

	repetition and conditions when introduced to the concept of selection (through the 'if...then...' structure) and write algorithms and programs that utilise this concept. To conclude the unit, learners will design and make a working model of a fairground carousel that will demonstrate their understanding of how the microcontroller and its components are connected, and how selection can be used to control the operation of the model. Throughout this unit, learners will apply the stages of programming design.						
Spring 2	Data and information – Flat-file databases This unit looks at how a flat-file database can be used to organise data in records. Learners will use tools within a database to order and answer questions about data. They will create graphs and charts from their data to help solve problems. They will also use a real-life database to answer a question, and present their work to others.	To use a form to record information ● I can create a database using cards ● I can explain how information can be recorded ● I can order, sort, and group my data cards	To compare paper and computer-based databases ● I can explain what a field and a record is in a database ● I can navigate a flat-file database to compare different views of information ● I can choose which field to sort data by to answer a given question	To outline how you can answer questions by grouping and then sorting data ● I can explain that data can be grouped using chosen values ● I can group information using a database ● I can combine grouping and sorting to answer specific questions	To explain that tools can be used to select specific data ● I can choose which field and value are required to answer a given question ● I can outline how 'AND' and 'OR' can be used to refine data selection ● I can choose multiple criteria to answer a given question	To explain that computer programs can be used to compare data visually ● I can select an appropriate chart to visually compare data ● I can refine a chart by selecting a particular filter ● I can explain the benefits of using a computer to create charts	To use a real-world database to answer questions ● I can ask questions that will need more than one field to answer ● I can refine a search in a real-world context ● I can present my findings to a group	
Summer 1	Vector Drawing In this unit, learners start to create vector drawings. They learn how to use different drawing tools to help them create images. Learners recognise that images in vector drawings are created using shapes and lines, and each individual element in the drawing is called an object. Learners layer their objects and begin grouping and duplicating them to support the creation of more complex pieces of work.	To identify that drawing tools can be used to produce different outcomes ● I can recognise that vector drawings are made using shapes ● I can experiment with the shape and line tools ● I can discuss how vector drawings are different from paper-based drawings	To create a vector drawing by combining shapes ● I can identify the shapes used to make a vector drawing ● I can explain that each element added to a vector drawing is an object ● I can move, resize, and rotate objects I have duplicated	To use tools to achieve a desired effect ● I can use the zoom tool to help me add detail to my drawings ● I can explain how alignment grids and resize handles can be used to improve consistency ● I can modify objects to create a new image	To recognise that vector drawings consist of layers ● I can identify that each added object creates a new layer in the drawing ● I can change the order of layers in a vector drawing ● I can use layering to create an image	To group objects to make them easier to work with ● I can copy part of a drawing by duplicating several objects ● I can recognise when I need to group and ungroup objects ● I can reuse a group of objects to further develop my vector drawing	To apply what I have learned about vector drawings ● I can create a vector drawing for a specific purpose ● I can reflect on the skills I have used and why I have used them ● I can compare vector drawings to freehand paint drawings	
Summer 2	Programming B – Selection in quizzing Learners will develop their knowledge of 'selection' by revisiting how 'conditions' can be used in programming, 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	To explain how selection is used in computer programs ● I can recall how conditions are used in selection ● I can identify conditions in a program ● I can modify a condition in a program	To relate that a conditional statement connects a condition to an outcome ● I can use selection in an infinite loop to check a condition ● I can identify the condition and outcomes in an 'if... then... else...' statement ● I can create a program that uses selection to produce different outcomes	To explain how selection directs the flow of a program ● I can explain that program flow can branch according to a condition ● I can design the flow of a program that contains 'if... then... else...' ● I can show that a condition can direct program flow in one of two ways	To design a program that uses selection ● I can outline a given task ● I can use a design format to outline my project ● I can identify the outcome of user input in an algorithm	To create a program that uses selection ● I can implement my algorithm to create the first section of my program ● I can test my program ● I can share my program with others	To evaluate my program ● I can identify ways the program could be improved ● I can identify the setup code I need in my program ● I can extend my program further	

	understanding in algorithms, and then by constructing programs in the Scratch programming environment. They learn how to write programs that ask questions and use selection to control the outcomes based on the answers given. They use this knowledge to design a quiz in response to a given task and implement it as a program. To conclude the unit, learners evaluate their program by identifying how it meets the requirements of the task, the ways they have improved it, and further ways it could be improved						

Year 6	Unit of Study	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Autumn 1	**Online Safety** In this unit about online safety, children will be taking a more in depth look at a variety of online safety issues, most of which they will have been familiarized with in previous years. They will be introduced to the idea of the internet, as a type of media, and how it can shape our ideas about boys and girls through stereotypes. Children will be given ways to deal with online content that they find worrying or even believe to be dangerous.	Catch up and classroom discussions	I can find similarities and differences between bullying and cyberbullying. ● I can say what bullying and cyberbullying are. ● I can identify good strategies to deal with cyberbullying. ● I can suggest ways in which people could deal with cyberbullying.	I can identify secure websites by identifying privacy seals of approval. ● I can look in the address bar of a website to check for security ● I can find a link to a privacy policy. ● I can identify warning signs that a website might not be secure.	I understand the benefits and pitfalls of online relationships. ● I can explain what to do if I am asked or told something online which makes me uncomfortable. ● I can identify information that I should never share. ● I can explain some of the dangers of revealing personal information to an online friend.	I can identify how the media play a powerful role in shaping ideas about girls and boys. ● I know what a stereotype is. ● I can compare gender stereotypes ● I can identify a gender stereotype in a media message.	I can apply my e-safety knowledge to my online activities. ● I can identify a situation I should be careful of online. ● I can choose an appropriate action online to stay safe. ● I know what the SMART acronym means.	I can use my knowledge of e-safety to create a multiple choice quiz. ● I can recall what I have learnt about e-safety. ● I can use my knowledge of e-safety to help teach others.
Autumn 2	**Creating Media – Web page creation** Learners will be introduced to creating 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, learners pay specific attention to copyright and fair use of media, the aesthetics of the site, and navigation paths.	To review an existing website and consider its structure ● I can explore a website ● I can discuss the different types of media used on websites ● I know that websites are written in HTML	To plan the features of a web page ● I can recognise the common features of a web page ● I can suggest media to include on my page ● I can draw a web page layout that suits my purpose	To consider the ownership and use of images (copyright) ● I can say why I should use copyright-free images ● I can find copyright-free images ● I can describe what is meant by the term 'fair use'	To recognise the need to preview pages ● I can add content to my own web page ● I can preview what my web page looks like ● I can evaluate what my web page looks like on different devices and suggest/make edits.	To outline the need for a navigation path ● I can explain what a navigation path is ● I can describe why navigation paths are useful ● I can make multiple web pages and link them using hyperlinks	To recognise the implications of linking to content owned by other people ● I can explain the implication of linking to content owned by others ● I can create hyperlinks to link to other people's work ● I can evaluate the user experience of a website	
Spring 1	**Programming – Variables** This unit explores the concept of variables in programming through games in Scratch. First, learners 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.	To define a 'variable' as something that is changeable ● I can identify examples of information that is variable ● I can explain that the way a variable changes can be defined ● I can identify that variables can hold numbers or letters	To explain why a variable is used in a program ● I can identify a program variable as a placeholder in memory for a single value ● I can explain that a variable has a name and a value ● I can recognise that the value of a variable can be changed	To choose how to improve a game by using variables ● I can decide where in a program to change a variable ● I can make use of an event in a program to set a variable ● I can recognise that the value of a variable can be used by a program	To design a project that builds on a given example ● I can choose the artwork for my project ● I can create algorithms for my project ● I can explain my design choices	To use my design to create a project ● I can create the artwork for my project ● I can choose a name that identifies the role of a variable ● I can test the code that I have written	To evaluate my project ● I can identify ways that my game could be improved ● I can use variables to extend my game ● I can share my game with others	

Spring 2	Data and Information - Introduction to spreadsheets This unit introduces the learners to spreadsheets. They will be supported in organising data into columns and rows to create their own data set. Learners 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 produce calculated data. Learners will be taught how to apply formulas that include a range of cells, and apply formulas to multiple cells by duplicating them. Learners will use spreadsheets to plan an event and answer questions. Finally, learners will create charts, and evaluate their results in comparison to questions asked.	To create a data set in a spreadsheet • I can collect data • I can suggest how to structure my data • I can enter data into a spreadsheet	To build a data set in a spreadsheet • I can explain what an item of data is • I can choose an appropriate format for a cell • I can apply an appropriate format to a cell	To explain that formulas can be used to produce calculated data • I can explain which data types can be used in calculations • I can construct a formula in a spreadsheet • I can identify that changing inputs changes outputs	To apply formulas to data • I can calculate data using different operations • I can create a formula which includes a range of cells • I can apply a formula to multiple cells by duplicating it	To create a spreadsheet to plan an event • I can use a spreadsheet to answer questions • I can explain why data should be organised • I can apply a formula to calculate the data I need to answer questions	To choose suitable ways to present data • I can produce a chart • I can use a chart to show the answer to a question • I can suggest when to use a table or chart	
Summer 1	3D Modelling Learners will develop their knowledge and understanding of using a computer to produce 3D models. Learners 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, learners 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.	To recognise that you can work in three dimensions on a computer • I can add 3D shapes to a project • I can view 3D shapes from different perspectives • I can move 3D shapes relative to one another	To identify that digital 3D objects can be modified • I can resize an object in three dimensions • I can lift/lower 3D objects • I can recolour a 3D object	To recognise that objects can be combined in a 3D model • I can rotate objects in three dimensions • I can duplicate 3D objects • I can group 3D objects	To create a 3D model for a given purpose • I can accurately size 3D objects • I can show that placeholders can create holes in 3D objects • I can combine a number of 3D objects	To plan my own 3D model • I can analyse a 3D model • I can choose objects to use in a 3D model ● I can combine objects in a design	To create my own digital 3D model • I can construct a 3D model based on a design • I can explain how my 3D model could be improved ● I can modify my 3D model to improve it	
Summer 2	Programming B – Sensing Movement 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	To create a program to run on a controllable device • I can apply my knowledge of programming to a new environment • I can test my program on an emulator • I can transfer my program to a controllable device	To explain that selection can control the flow of a program • I can identify examples of conditions in the real world • I can use a variable in an if, then, else statement to select the flow of a program • I can determine the flow of a program using selection	To update a variable with a user input • I can use a condition to change a variable • I can experiment with different physical inputs • I can explain that checking a variable doesn't change its value	To use an conditional statement to compare a variable to a value • I can use an operand (e.g. <>=) in an if, then statement • I can explain the importance of the order of conditions in else, if statements • I can modify a program to achieve a different outcome	To design a project that uses inputs and outputs on a controllable device • I can decide what variables to include in a project • I can design the algorithm for my project • I can design the program flow for my project	To develop a program to use inputs and outputs on a controllable device • I can create a program based on my design • I can test my program against my design • I can use a range of approaches to find and fix bugs	

	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.						