Contents

Barham Primary School – Computing Year 1

Statutory guidance - National curriculum in England: <u>computing</u> programmes of study   **Updated 30th August 2024**

<u>Purpose of study</u>
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.

<u>Aims</u>
The national curriculum for computing aims to ensure that all pupils:
▪ can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
▪ can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
▪ can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
▪ are responsible, competent, confident and creative users of information and communication technology.

Key stage 1

<u>Pupils should be taught to:</u>
▪ 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.

Term	Week	Topic/Lesson	Key Vocabulary	Intent	Implementation	Impact
Autumn 1	Week 1	**<u>E-safety</u>** **Managing Online Information**	Lesson 1 – Devices and the internet Lesson 2 – Finding information	• I can talk about how to use the internet as a way of finding information online. • I can identify devices I could use to access information on the internet. I can give simple examples of how to find information using digital technologies (e.g. search engines, voice activated searching).		
	Week 2	**<u>Technology around us</u>** Technology around us	Technology	To identify technology: • To explain technology as something that helps us. • To locate examples of technology in the classroom. I can explain how these technology examples help us.	Children will become familiar with the term 'technology'. They will classify what is and what is not technology in their school and/or classroom. Learners will demonstrate their understanding of how technology helps us in different ways.	Children will develop their understanding of technology and how it can help them in their everyday lives. They will start to become familiar with the different components of a computer by developing their keyboard and mouse skills. Learners will also consider
	Week 3	**<u>Technology around us</u>** Using technology	Computer, mouse, trackpad, keyboard, screen	To identify a computer and its main parts: • To name the main parts of a computer • To switch on and log into a computer	Children will get to know the main parts of a desktop or laptop computer. They will practise turning on and logging in to a computer. The learners will apply their knowledge of the different parts of a computer,	

				• I can use a mouse to click and drag.	to complete a mouse-based task.	how to use technology responsibly.
	Week 4	**Technology around us** Developing mouse skills	Computer, mouse, trackpad, double-click	To use a mouse in different ways: • To use a mouse to open a program • To click and drag to make objects on a screen • I can use a mouse to create a picture.	Children will be building on the mouse skills they were introduced to in Lesson 2. Learners will review images of a computer to explain what each part does. They will develop an understanding that different computers use different mice, but they perform the same function. They will use the mouse to open a program and create a simple picture.	
	Week 5	**Technology around us** Using a computer keyboard	Computer, keyboard, mouse, typing	To use a keyboard to type on a computer: • To say what a keyboard is for • To type my name on a computer • I can save my work to a file.	Children will begin to use the computer keyboard for a purpose. They should understand that writing on a keyboard is called typing and will begin to demonstrate their ability to write their name. Learners will then save their work using the save icon and understand that this icon is used in lots of different programs.	
	Week 6	**Technology around us** Developing keyboard skills	Keyboard, computer	To use the keyboard to edit text: • To open my work from a file • To use the arrow keys to move the cursor • I can delete letters.	Children will begin by opening a file they have previously created. They will demonstrate their ability to use a keyboard to edit text, by writing a sentence and then deleting letters. They will also use the keyboard arrow keys to move the text cursor in their textbox.	
	Week 7	**Technology around us** Using a computer responsibly	Computer, technology	To create rules for using technology responsibly: • To identify rules to keep us safe and healthy when we are using technology in and beyond the home • To give examples of some of these rules • I can discuss how we benefit from these rules.	Children will be introduced to the concept of using computers safely, within the context of a school setting. They will explore why we have rules in school and how those rules help us, and then apply this understanding to rules needed for using computer technology safely.	
	Autumn 2 Week1	**Managing Online Information**	Lesson 3 – Real or make-believe?	• I know/understand that I can encounter a range of things online, including things I like and don't like as well as things which are real or make believe/a joke. • I know how to get help from a trusted adult if I see content that makes me feel sad, uncomfortable		
	Week 2	**Digital Painting** Creating media- Digital painting. How can we paint using computers?	paint program, tool, paintbrush, erase, fill, undo	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	This lesson introduces learners to the freehand tools available for digital painting.	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
	Week 3	**Digital Painting** Using shape and lines	Piet Mondrian, primary colours, shape tools, line tool, fill tool, undo tool	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	This lesson introduces learners to the line and shape tools and revisits the fill and undo tools used for digital painting. Learners create their own digital painting in the style of an artist.	

3

				• I can use the shape and line tools to recreate the work of an artist		without the use of digital devices.
	Week 4	**Digital Painting** Making careful choices	Henri Matisse, shape tool, fill tool	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	This lesson introduces learners to a range of shape tools, allowing them to create a painting in the style of an artist.	
	Week 5	**Digital Painting** Why did I choose that?	Wassily Kandinsky, tools, feelings, colour, brush style	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	This lesson increases learners' understanding of the available paint tools and encourages them to select the best tools to create a digital painting in the style of Wassily Kandinsky.	
	Week 6	**Digital Painting** Painting all by myself	Georges Seurat, pointillism, brush size	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	Learners select appropriate colours, brush sizes, and brush tools to independently create their own image in the style of an artist.	
	Week 7	**Digital Painting** Comparing computer art and painting	pictures, painting, computers, like, prefer, dislike	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	Learners compare their preferences when creating paintings on computers and on paper.	
Spring 1	Week1	**Managing Online Information**	Lesson 1 – Devices and the internet Lesson 2 – Finding information Lesson 3 – Real or make-believe?	• I can talk about how to use the internet as a way of finding information online. • I can identify devices I could use to access information on the internet. • I can give simple examples of how to find information using digital technologies (e.g. search engines, voice activated searching). • I know/understand that I can encounter a range of things online, including things I like and don't like as well as things which are real or make believe/a joke. • I know how to get help from a trusted adult if I see content that makes me feel sad, uncomfortable worried or frightened.		
	Week 2	**Moving a robot** Buttons	Forwards, backwards, turn, clear, go, commands	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	This lesson introduces the learners to floor robots. Learners will talk about what the buttons might do and then try the buttons out. Time will be spent linking an outcome to a button press. Learners will consider the direction command buttons, as well as buttons to clear memory and run programs.	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
	Week 3	**Moving a robot** Directions	Instructions, directions	To act out a given word • I can follow an instruction • I can recall words that can be acted out • I can give directions	During this lesson, learners will think about the language used to give directions and how precise it needs to be. Learners will also work with a partner, giving and following instructions. This real-world activity should, at suitable points during this lesson,	

				be related to the floor robot that was introduced in the last lesson.	ensure time is spent on all aspects of programming and builds knowledge in a structured manner. Learners are also introduced to the early stages of program design through the introduction of algorithms.
	Week 4	**Moving a robot** Four directions	Left, right, turn, commands	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 • I can predict the outcome of a sequence involving up to four commands	In this lesson, learners will use left and right turn commands along with forwards and backwards commands. Doing this will allow learners to develop slightly more complex programs. Learners will create their programs in this lesson through trial and error before moving onto planning out their programs in the next lesson. In the last activity, learners will predict where given programs will move the robot. Learners will make their predictions by 'stepping through' the commands and matching the program steps to movements.	
	Week 5	**Moving a robot** Getting there	Plan, algorithm, program	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	In this lesson, learners will decide what their program will do. They will then create their program and test it on the robot. Where needed, learners will also debug their programs.	There are two year 1 programming units: • Programming A - Moving a robot • Programming B - Programming animations This is unit A which should be delivered before unit B.
	Week 6	**Moving a robot** Routes	Route, plan, 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	This lesson encourages learners to plan their routes before they start to write their programs. The activities also introduce the concept of there being more than one way to solve a problem. This concept applies to a lot of programming activities: the same outcome can be achieved through a number of different approaches, and there isn't necessarily a 'right' way. The lesson also introduces the idea of program design, in which learners need to plan what they want their program to achieve before they start programming.	
	Spring 2 Week 1	**E-Safety** **Health, Wellbeing & Lifestyle**	Lesson 1 – Being healthy with technology Lesson 2 – Technology rules Lesson 3 – Following the rules	• I can identify rules that help keep us safe and healthy in and beyond the home when using technology. • I can give some simple examples of these rules. • I can explain rules to keep myself safe when using technology both in and beyond the home.	
	Week 2	**Grouping Data** Label and match	Object, label, group, search, image	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	Learners will begin to understand that objects have many different labels that can be used to put them into groups. They will name different objects and begin to experiment with placing them into different groups. Learners will also label a group of objects, and begin to understand that an object can fit into more than one group depending on the context.	This unit introduces learners to data and information. Labelling, grouping, and searching are important aspects of data and information. Searching is a common operation in many applications, and requires an understanding that to search data, it must have labels. This unit of work focuses on assigning data (images) with
	Week 3	**Grouping Data** Group and Count	Group, object, label, image	To identify that objects can be counted • I can count objects • I can group objects • I can count a group of objects	Learners will begin to think about grouping objects based on what the objects are. They will demonstrate the ability to count a small number of objects before they group them, and will then begin to show that	

					they can count groups of objects with the same label. Learners will also begin to learn that computers are not intelligent, and require input from humans to perform tasks.	different labels in order to demonstrate how computers are able to group and present data.
	Week 4	**Grouping Data** Describe an object	Group, object, property, label, colour, size, shape	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	Learners will begin to understand that objects can be described in many different ways. They will identify the properties of objects and begin to understand that properties can be used to group objects; for example, objects can be grouped by colour or size. Finally, learners will demonstrate their ability to find objects with similar properties and begin to understand the reason that we need to give labels to images on a computer.	During this unit, learners will be logging on to the computers, opening their documents, and saving their documents. Depending on how your school's system is set up, additional support and time may be required to facilitate these steps, and consideration should be given as to how this will impact the timings of activities in each lesson.
	Week 5	**Grouping Data** Making different groups	Group, object, property, value, label, colour, data set	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	Learners will classify objects based on their properties. They will group objects that have similar properties, and will be able to explain how they have grouped these. Learners will begin to group a number of the same objects in different ways, and will demonstrate their ability to count these different groups.	
	Week 6	**Grouping Data** Comparing groups	Group, object, property, value, label, colour, size, shape, more, less, most, fewest	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	Learners will choose how they want to group different objects by properties. They will begin to compare and describe groups of objects, then they will record the number of objects in each group.	
	Week 7	**Grouping Data** Answering questions	Group, object, property, value, label, colour, data set, more, less, most, least, fewest, the same	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	Learners will decide how to group objects to answer questions. They will compare their groups by thinking about how they are similar or different, and they will record what they find. They will then share what they have found with their peers.	
Summer1	Week 1	**E-Safety** **Privacy & Security**	Lesson 1 – My private information Lesson 2 – Can I share my information? Lesson 3 - Passwords	• I can identify some simple examples of my personal information (e.g. name, address, birthday, age, location). • I can describe who would be trustworthy to share this information with; I can explain why they are trusted. • I can explain that passwords are used to protect information, accounts and devices. • I can recognise more detailed examples of information that is personal to someone (e.g. where someone lives and goes to school, family names). • I can explain why it is important to always ask a trusted adult before sharing any personal information online belonging to myself or others.		
	Week 2	**Digital Writing** Exploring the Keyboard	Word processor, keyboard, keys, letters, type	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	Learners will familiarise themselves with a word processor and think about how they might use this application in the future. The learners will also identify and find keys, before adding text to their page by pressing keys on a keyboard.	Learners will develop their understanding of the various aspects of using a computer to create and manipulate text. They will become more

	Week 3	**Digital Writing** Adding and removing text	Numbers, space, backspace, text cursor	To identify a computer and its main parts: • To name the main parts of a computer • To switch on and log into a computer • I can use a mouse to click and drag.	Learners will continue to familiarise themselves with word processors and how they can interact with the computer using a keyboard. The learners will focus on adding text and will explore more of the keys found on a keyboard. Finally, they will begin to use the Backspace key to remove text from the computer.	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.
	Week 4	**Digital Writing** Exploring the toolbar	Capital letters, toolbar, bold, italic, underline	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	Learners will begin to explore the different tools that can be used in word processors to change the look of the text. Learners will use the Caps Lock key to add capital letters to their writing and will begin thinking about how to use this successfully. Learners will match simple descriptions to the related keys. Finally, learners will begin exploring the different buttons available on the toolbar in more detail, and use these to change their own text.	
	Week 5	**Digital Writing** Making changes to text	Mouse, select, font	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	Learners will begin to understand when it is best to change the look of their text and which tool will achieve the most appropriate outcome. The learners will begin to use their mouse cursor to select text to enable them to make more efficient changes. They will explore the different fonts available to them and change the font for their lost toy poster.	
	Week 6	**Digital Writing** Explaining my choices	Undo, redo, font, format	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	Learners will begin to justify their use of certain tools when changing text. The learners will decide whether the changes that they have made have improved their writing and will begin to use 'Undo' to remove changes. They will begin to consolidate their ability to select text using the cursor, through double-clicking and clicking and dragging. The learners will be able to explain what tool from the toolbar they have used to change their writing.	
	Week 7	**Digital Writing** Pencil or keyboard?	Compare, typing, writing	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	Learners will make comparisons between using a computer for writing and writing on paper. The learners will discuss how the two methods are the same and different and think of examples to explain this. They will demonstrate making changes to writing using a computer to compare the two methods. Finally, the learners will begin to explain which they like best and think about which method would be the best method to use in different situations.	
	Week 1	**E-Safety** **Copyright & Ownership**	Lesson 1 – Making documents Lesson 2 – Is it mine? Lesson 3 - Copies	• I know that work I create belongs to me. • I can name my work so that others know it belongs to me. • I can explain why work I create using technology belongs to me. • I can say why it belongs to me (e.g. 'I designed it' or 'I filmed it'). • I can save my work under a suitable title/name so that others know it belongs to me (e.g. filename, name on content).		

				I understand that work created by others does not belong to me even if I save a copy		
	Week 2	**Programming animations** Comparing tools	ScratchJr, Bee-Bot, command, sprite, compare, programming, programming area	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	During this lesson learners will become accustomed to the ScratchJr programming environment. They will discover that they can move characters on-screen using commands, and compare ScratchJr to the Bee-Bots used in the previous unit.	Learners will be introduced to on-screen programming through ScratchJr. Learners will explore the way a project looks by investigating sprites and backgrounds. They will use programming blocks to use, modify, and create programs. Learners will also be introduced to the early stages of program design through the introduction of algorithms.
	Week 3	**Programming animations** Joining blocks	Block, joining, command, **Start** block, run, program, programming area, background, delete, reset, algorithm, predict	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	During this lesson learners will discover that blocks can be joined together in ScratchJr. They will use a **Start** block to run their programs. They will also learn additional skills such as adding backgrounds and deleting sprites. Learners will follow given algorithms to create simple programs.	
	Week 4	**Programming animations** Make a change	Effect, change, value, block	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	During this lesson learners will discover that some blocks in ScratchJr have numbers underneath them. They will learn how to change these values and identify the effect on a block of changing a value.	There are two Year 1 programming units: • Programming A – Moving a robot • Programming B – Programming animations This is unit B, which should be delivered after unit A.
	Week 5	**Programming animations** Adding sprites	Instructions, sprite, delete, program, algorithm	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	During this lesson learners will be taught how to add and delete sprites in ScratchJr. They will discover that each sprite has its own programming area, and learn how to add programming blocks to give instructions to each of the sprites.	
	Week 6	**Programming animations** Project design	Sprite, background, appropriate, algorithm	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	During this lesson learners will choose appropriate backgrounds and sprites for a 'Space race' project. They will decide how each sprite will move, and create an algorithm based on the blocks available in ScratchJr that reflects this.	All the lessons in this unit require access to ScratchJr. • Download ScratchJr App for tablets (iPad or Android), or install ScratchJr for computers (https://jfo8000.github.io/ScratchJr-Desktop/) before the lesson
	Week 7	**Programming animations** Follow my design	Sprite, design, programming blocks, algorithm, programs	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	During this lesson learners will use their project designs from the previous lesson to create their projects on-screen in ScratchJr. They will use their project design, including algorithms created in the previous lesson, to make programs for each of their rocket sprites. They will test whether their algorithms are effective when their programs are run.	
	Week 7	**Programming animations** Follow my design	Sprite, design, programming blocks, algorithm, programs	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	During this lesson learners will use their project designs from the previous lesson to create their projects on-screen in ScratchJr. They will use their project design, including algorithms created in the previous lesson, to make programs for each of their rocket sprites. They will test whether their algorithms are effective when their programs are run.	

Barham Primary School – Computing Year 2

Term	Week	Topic/Lesson	Key Vocabulary	Intent	Implementation	Impact
Autumn 1	Week 1	**E-Safety** **Self-image & Identity**	Lesson 1 – What I want to look like online Lesson 2 – Risky situations online Lesson 3 – Giving advice	• I can explain how other people may look and act differently online and offline. • I can give examples of issues online that might make someone feel sad, worried, uncomfortable or frightened; I can give examples of how they might get help.		
	Week 2	**IT around us** What is IT?	Information technology (IT), computer	To recognise the uses and features of information technology • I can identify examples of computers • I can describe some uses of computers • I can identify that a computer is a part of IT	Learners will develop their understanding of what information technology (IT) is. They will identify devices that are computers and consider how IT can help them both at school and beyond.	Learners will develop their understanding of what information technology (IT) is and will begin to identify examples. They will discuss where they have seen IT in school and beyond, in settings such as shops, hospitals, and libraries. Learners will then investigate how IT improves our world, and they will learn about the importance of using IT responsibly.
	Week 3	**IT around us** IT in school	Information technology (IT)	To identify the uses of information technology in the school • I can identify examples of IT • I can sort school IT by what it's used for • I can identify that some IT can be used in more than one way	Learners will consider common uses of information technology in a context that they are familiar with. They will identify examples of IT and be able to explain the purpose of different examples of IT in the school setting.	
	Week 4	**IT around us** IT in the world	Information technology (IT), computer	To identify information technology beyond school	Learners will begin to explore IT in environments beyond school, including home and familiar places such as shops.	

			- I can find examples of information technology - I can sort IT by where it is found - I can talk about uses of information technology	They will talk about the uses of IT in these environments and be able to explain that IT is used in many workplaces.	
	Week 5	**IT around us** The benefits of IT	Information technology (IT), computer, barcode, scanner/scan	To explain how information technology helps us - I can recognise common types of technology - I can demonstrate how IT devices work together - I can say why we use IT	Learners will explore the benefits of using IT in the wider world. They will focus on the use of IT in a shop and how devices can work together. Learners will sort activities based on whether they use IT or not and will be able to say why we use IT.	
	Week 6	**IT around us** Using IT safely	Information technology	To explain how to use information technology safely - I can list different uses of information technology - I can talk about different rules for using IT - I can say how rules can help keep me safe	Learners will consider how they use different forms of information technology safely, in a range of different environments. They will list different uses of IT and talk about the different rules that might be associated with using them. Learners will then say how rules can help keep them safe when using IT.	
	Week 7	**IT around us** Using IT in different ways	Information technology	To recognise that choices are made when using information technology - I can identify the choices that I make when using IT - I can use IT for different types of activities - I can explain the need to use IT in different ways	Learners will think about the choices that are made when using information technology, and the responsibility associated with those choices. They will use IT in different types of activities and explain that sometimes they will need to use IT in different ways.	
	Week1	**E-Safety** **Online Relationships**	Lesson 1 – How to ask permission Lesson 2 – Consent Lesson 3 – Consent and sharing online	- I can give examples of how someone might use technology to communicate with others they don't also know offline and explain why this might be risky (e.g. email, online gaming, a pen-pal in another school/country). - I can explain who I should ask before sharing things about myself or others online. - I can describe different ways to ask for, give or deny my permission online and can identify who can help me if I am not sure. - I can explain why I have a right to say, 'no' or 'I will have to ask someone'. I can explain who can help me if I feel under pressure to agree to something I am unsure about or don't want to do. - I can identify who can help me if something happens online without my consent. - I can explain how it may make others feel if I do not ask their permission or ignore their answers before sharing something about them online. I can explain why I should always ask a trusted adult before clicking 'yes', 'agree' or 'accept' online.		
	Week 2	**Digital Photography** Taking photographs	Device, camera, photograph, capture, image, digital	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	This lesson introduces the concept that many devices can be used to take photographs. In the lesson, learners begin to capture their own photographs.	Learners will learn to recognise that different devices can be used to capture photographs and will gain experience capturing, editing, and

				• I can explain what I did to capture a digital photo		improving photos. Finally, they will use this knowledge to recognise that images they see may not be real.
	Week 3	**Digital Photography** Landscape or portrait?	Landscape, portrait	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	A photograph can be taken in either portrait or landscape format. In this lesson, learners explore taking photographs in both portrait and landscape formats and explore the reasons why a photographer may favour one over the other.	
	Week 4	**Digital Photography** What makes a good photograph?	Framing, subject, compose	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	A photograph is composed by a photographer. In this lesson, learners discover what constitutes good photography composition and put this into practice by composing and capturing photos of their own.	It is recommended that you use digital cameras to take photographs in these lessons, so that learners can experience a range of devices. However, tablets or other devices with cameras will also work. This unit uses screenshots from the website https://pixlr.com/x/, but you could also use the Pixlr app if you're using tablets.
	Week 5	**Digital Photography** Lighting	Light sources, flash, focus, background	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	This lesson introduces the concepts of light and focus as further important aspects of good photography composition. In this lesson, learners investigate the effect that good lighting has on the quality of the photos they take, and explore what effect using the camera flash and adding an artificial light source have on their photos. They also learn how the camera autofocus tool can be used to make an object in an image stand out.	
	Week 6	**Digital Photography** Effects	Editing, filter	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	This lesson introduces the concept of simple image editing. Learners are introduced to the Pixlr image editing software and use the 'Adjust' tool to change the colour effect of an image.	
	Week 7	**Digital Photography** Is it real?	Format, framing, lighting, focus, filter	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	This lesson introduces the concept that images can be changed for a purpose. Learners are introduced to a range of images that have been changed in different ways and through this, develop an awareness that not all images they see are real. To start the lesson, learners are first challenged to take their best photograph by applying the photography composition skills that they have developed during the unit.	
	Spring 1 Week1	**E-Safety** **Managing Online Information**	Lesson 1 – The main parts of a webpage Lesson 2 – Voice-activated searching Lesson 3 – True or not?	• I can use simple keywords in search engines. • I can demonstrate how to navigate a simple webpage to get to information I need (e.g. home, forward, back buttons; links, tabs and sections). • I can explain what voice activated searching is and how it might be used, and I know it is not a real person (e.g. Alexa, Google Now, Siri).		

				• I can explain the difference between things that are imaginary, made up or make believe and things that are true or real. I can explain why some information I find online may not be real or true.		
	Week 2	**Robot algorithms** Giving instructions	Instruction, sequence, clear, unambiguous, algorithm, program	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 enacted as a sequence • I can give clear and unambiguous instructions	In this lesson, pupils will follow instructions given to them and give instructions to others. Pupils will consider the language used to give instructions and how that language needs to be clear and precise. Pupils will combine several instructions into a sequence that can then be issued to another pupil to complete. Pupils will then consider this clear and precise set of instructions in relation to an algorithm, and they will think about how computers can only follow clear and unambiguous instructions.	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 knowledge in a structured manner. Learners are also introduced to the early stages of program design through the introduction of algorithms. There are two year 1 programming units: • Programming A - Moving a robot • Programming B - Programming animations This is unit A which should be delivered before unit B.
	Week 3	**Robot algorithms** Same but different	Sequence, order, algorithm, instructions	To explain what happens when we change the order of instructions • I can create different algorithms for a range of sequences (using the same commands) • 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 commands	This lesson focuses on sequences, and guides pupils to consider the importance of the order of instructions within a sequence. Pupils will create several short sequences using the same commands in different orders. They will then test these sequences to see how the different orders affect the outcome.	
	Week 4	**Robot algorithms** Making predictions	Sequence, prediction, program	To use logical reasoning to predict the outcome of a program (series of commands) • I can follow a sequence • I can predict the outcome of a sequence • I can compare my prediction to the program outcome	In this lesson, pupils will use logical reasoning to make predictions. They will follow a program step by step and identify what the outcome will be.	
	Week 5	**Robot algorithms** Mats and routes	Artwork, design, route, mat	To explain that programming projects can have code and artwork • I can explain the choices 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	In this lesson, pupils will design, create, and test a mat for a floor robot. This will introduce the idea that design in programming not only includes code and algorithms, but also artefacts related to the project, such as artwork and audio.	
	Week 6	**Robot algorithms** Algorithm design	Algorithm	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	In this lesson, pupils will design algorithms to move their robot around the mats that they designed in Lesson 4. As part of the design process, pupils will outline what their task is by identifying the starting and finishing points of a route. This outlining will ensure that pupils clearly understand what they want their program to achieve.	

				program	
	Week 7	**Robot algorithms** Debugging	Debugging, algorithm, program, decomposition	To create and debug a program that I have written • I can plan algorithms for different parts of a task • I can test and debug each part of the program • I can put together the different parts of my program	In this lesson, pupils will take on a larger programming task. They will break the task into chunks and create algorithms for each chunk. This process is known as 'decomposition' and is covered further in key stage 2. Pupils will also find and fix errors in their algorithms and programs. This is known as 'debugging'.	
	Spring 2 Week 1	**E-Safety** **Health, Wellbeing & Lifestyle**	Lesson 1 – Using technology Lesson 2 – Following our technology rules Lesson 3 – Family rules	• I can explain simple guidance for using technology in different environments and settings (e.g. accessing online technologies in public places and the home environment). I can say how those rules/guides can help anyone accessing online technologies.	
	Week 2	**Pictograms** Counting and comparing	More than, less than, most, least, organise, data, object, tally chart, votes, total	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	During this lesson learners will begin to understand the importance of organising data effectively for counting and comparing. They will create their own tally charts to organise data, and represent the tally count as a total. Finally, they will answer questions comparing totals in tally charts using vocabulary such as 'more than' and 'less than'.	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. During this unit of work learners will use j2e pictogram tool which can be accessed online using a desktop, laptop or tablet computer. Your school may have access to an equivalent alternative which could be used instead.
	Week 3	**Pictograms** Enter the data	Pictogram, enter, data, tally chart, compare, more than, less than, objects, count	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	During this lesson learners will become familiar with the term 'pictogram'. They will create pictograms manually and then progress to creating them using a computer. Learners will begin to understand the advantages of using computers rather than manual methods to create pictograms, and use this to answer simple questions.	
	Week 4	**Pictograms** Creating pictograms	Tally chart, data, pictogram, explain, more, less, most, least, more common, least common	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	During this lesson learners will think about the importance of effective data collection and will consider the benefits of different data collection methods: why, for example, we would use a pictogram to display the data collected. They will collect data to create a tally chart and use this to make a pictogram on a computer. Learners will explain what their finished pictogram shows by writing a range of statements to describe this.	
	Week 5	**Pictograms** What is an attribute?	Attribute, group, same, different, object, more than/less than, most/least	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	During this lesson learners will think about ways in which objects can be grouped by attribute. They will then tally objects using a common attribute and present the data in the form of a pictogram. Learners will answer questions based on their pictograms using mathematical vocabulary such as 'more than'/'less than' and 'most'/'least'.	

	Week 6	**Pictograms** Comparing people	Attribute, compare, tally chart, pictogram, more than, less than, most popular, least popular, conclusion	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	During this lesson learners will understand that people can be described by attributes. They will practise using attributes to describe images of people and the other learners in the class. The learners will collect data needed to organise people using attributes and create a pictogram to show this pictorially. Finally, learners will draw conclusions from their pictograms and share their findings.
	Week 7	**Pictograms** Presenting information	Tally chart, pictogram, block diagram, most, least, common, sharing, data	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	During this lesson learners will understand that there are other ways to present data than using tally charts and pictograms. They will use a pre-made tally chart to create a block diagram on their device. Learners will then share their data with a partner and discuss their findings. They will consider whether it is always OK to share data and when it is not OK. They will know that it is alright to say no if someone asks for their data, and how to report their concerns.
Summer 1	**Week1**	**E-Safety** **Privacy & Security**	Lesson 1 – Keeping things private Lesson 2 – Stronger passwords Lesson 3 – The internet at home	• I can explain how passwords can be used to protect information, accounts and devices. • I can explain and give examples of what is meant by 'private' and 'keeping things private'. • I can describe and explain some rules for keeping personal information private (e.g. creating and protecting passwords). I can explain how some people may have devices in their homes connected to the internet and give examples (e.g. lights, fridges, toys, televisions).	
	Week 2	**Making music** How music makes us feel	Music, planets, Mars, Venus, war, peace, quiet, loud, feelings, emotions	To say how music can make us feel • I can identify simple differences in pieces of music • I can listen with concentration to a range of music (links to the Music curriculum) • I can describe how music makes me feel, e.g. happy or sad	The learners will listen to and compare two pieces of music from *The Planets* by Gustav Holst. They will then use a musical description word bank to describe how this music generates emotions, i.e. how it makes them feel.	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.
	Week 3	**Making music** Rhythms and patterns	Pattern, rhythm, pulse	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	In this lesson, learners will explore **rhythm**. They will create patterns and use those patterns as rhythms. They will use untuned percussion instruments and computers to hear the different rhythm patterns that they create.	
	Week 4	**Making music** How music can be used	Neptune, pitch, tempo, rhythm, notes	To describe how music can be used in different ways • I can connect images with sounds • I can use a computer to experiment with pitch and duration • I can relate an idea to a piece of music	In this lesson, learners will explore how music can be used in different ways to express emotions and to trigger their imaginations. They will experiment with the pitch and duration of notes to create their own piece of music, which they will then associate with a physical object — in this case, an animal.	
	Week 5	**Making music**	Pattern, notes, instrument, tempo	To show how music is made from a series of notes	In this lesson, learners will develop their understanding of music. They will use a computer to create and refine musical	

		Notes and temp		● I can identify that music is a sequence of notes ● I can use a computer to create a musical pattern using three notes ● I can refine my musical pattern on a computer	patterns.
	Week 6	**Making music** Creating digital music	Create, emotion, pitch, pulse/beat, tempo, instrument, rhythm, notes	To create music for a purpose ● I can describe an animal using sounds ● I can explain my choices ● I can save my work	In this lesson, learners will choose an animal and create a piece of music using the animal as inspiration. They will think about their animal moving and create a rhythm pattern from that. Once they have defined a rhythm, they will create a musical pattern (melody) to go with it.
	Week 7	**Making music** Reviewing and editing music	Open, edit	To review and refine our computer work ● I can reopen my work ● I can explain how I made my work better ● I can listen to music and describe how it makes me feel	In this lesson, learners will retrieve and review their work. They will spend time making improvements and then share their work with the class.
	Summer 2 Week1	**E-Safety** **Copyright & Ownership**	Lesson 1 – Does it belong to me? Lesson 2 – Does it belong to them? Lesson 3 – Copying work and ownership	● I can recognise that content on the internet may belong to other people. I can describe why other people's work belongs to them.	
	Week 2	**Programming Quizzes** ScratchJr recap	Sequence, command, program, run, start **Note:** The words 'start' and 'run' will be used interchangeably during this lesson. It may be helpful to point this out to learners at an appropriate point in the lesson.	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	During this lesson, learners will recap what they know already about the ScratchJr app. They will begin to identify the start of sequences in real-world scenarios, and learn that sequences need to be started in ScratchJr. Learners will create programs and run them in full-screen mode using the **Green flag**.	This unit initially recaps on learning from the Year 1 ScratchJr 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. There are two Year 2 programming units: ● Programming A – Robot algorithms
	Week 3	**Programming Quizzes** Outcomes	Sequence, command, outcome, predict, program, blocks	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	During this lesson, learners will discover that a sequence of commands has an 'outcome'. They will predict the outcomes of real-life scenarios and a range of small programs in ScratchJr. Learners will then match programs that produce the same outcome when run, and use a set of blocks to create programs that produce different outcomes when run.	
	Week 4	**Programming Quizzes** Using a design	Sprite, algorithm, blocks, design, sequence, predict	To create a program using a given design	During this lesson, learners will be taught how to use the **Start on tap** and **Go to page** (**Change background**) blocks. They will use a predefined design to create an	

				● 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	animation based on the seasons. Learners will then be introduced to the task for the next lesson. They will predict what a given algorithm might mean.	● Programming B – Programming quizzes This is unit B, which should be delivered after unit A.
	Week 5	**<u>Programming Quizzes</u>** Changing a design	Actions, sprite, project, blocks, design, sequence, modify, change	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	During this lesson, learners will look at an existing quiz design and think about how this can be realised within the ScratchJr app. They will choose backgrounds and characters for their own quiz projects. Learners will modify a given design sheet and create their own quiz questions in ScratchJr.	
	Week 6	**<u>Programming Quizzes</u>** Designing and creating a program	Design, algorithm, build, sequence, blocks, match	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	During this lesson, learners will create their own quiz question designs including their own choices of question, artwork, and algorithms. They will increase the number of blocks used within their sequences to create more complex programs.	
	Week 7	**<u>Programming Quizzes</u>** Evaluating	Compare, design, debug, program, features, evaluate	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	During this lesson, learners will compare their projects to their designs. They will think about how they could improve their designs by adding additional features. They will modify their designs and implement the changes on their devices. Learners will find and correct errors in programs (debug) and discuss whether they debugged errors in their own projects.	

Barham Primary School – Computing Year 3

Statutory guidance - National curriculum in England: <u>computing</u> programmes of study   **Updated 30th August 2024**

<u>**Purpose of study**</u>
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.

<u>**Aims**</u>
The national curriculum for computing aims to ensure that all pupils:
▪ can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
▪ can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
▪ can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
▪ are responsible, competent, confident and creative users of information and communication technology.

Key stage 2

<u>**Pupils should be taught to:**</u>

- 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.

Term	Week	Topic/Lesson	Key Vocabulary	Intent	Implementation	Impact
Autumn 1	Week1	**E-safety** **Self-image & Identity**	Lesson 1 – Avatars Lesson 2 – Usernames online Lesson 3 – Changing identity online	- I can explain what is meant by the term 'identity'. - I can explain how people can represent themselves in different ways online. I can explain ways in which someone might change their identity depending on what they are doing online (e.g. gaming, using an avatar, social media) and why.		

	Week 2	**Connecting computers** How does a digital device work?	Digital device, input, process, output	To explain how digital devices function • I can explain that digital devices accept inputs • I can explain that digital devices produce outputs • I can follow a process	This lesson introduces the concepts of input, process, and output. These concepts are fundamental to all digital devices.	Learners will develop their understanding of digital devices, with an initial focus on inputs, processes, and outputs. They will also compare digital and non-digital devices. Next, learners will be introduced to computer networks, including devices that make up a network's infrastructure, such as wireless access points and switches. Finally, learners will discover the benefits of connecting devices in a network. You will need digital devices for learners to interact with during this unit. Lesson 3 requires digital devices with a painting application. Lesson 6 includes a 'network tour', which involves learners identifying key parts of your school network. You will therefore need access to your school's server, switch, and wireless access points.
	Week 3	**Connecting computers** What parts make up a digital device?	Digital device, input, process, output	To identify input and output devices • I can classify input and output devices • I can describe a simple process • I can design a digital device	Learners will develop their knowledge of the relationship between inputs, processes, and outputs and apply it to devices and parts of devices that they will be familiar with from their everyday surroundings.	
	Week 4	**Connecting computers** How do digital devices help us?	Program, digital, non-digital	To recognise how digital devices can change the way that we work • I can explain how I use digital devices for different activities • I can recognise similarities between using digital devices and using non-digital tools • I can suggest differences between using digital devices and using non-digital tools	Learners will apply their learning from Lessons 1 and 2 by using programs in conjunction with inputs and outputs on a digital device. They will create two pieces of work with the same focus, using digital devices to create one piece of work, and non-digital tools to create the other. Learners will then compare and contrast the two approaches.	
	Week 5	**Connecting computers** How am I connected?	Connection, network, network switch	To explain how a computer network can be used to share information • I can recognise different connections • I can explain how messages are passed through multiple connections • I can discuss why we need a network switch	Many digital devices are now connected to other digital devices, eg computers through wires, tablets through Wi-Fi, and smartphones through mobile phone networks. The benefit of connecting digital devices is that it allows information to be shared between users and systems. This lesson introduces the concept of connections and moving information between connected devices. Learners will learn to explain how and why computers are joined together to form networks.	
	Week 6	**Connecting computers** How are computers connected?	Server, wireless access point	To explore how digital devices can be connected • I can recognise that a computer network is made up of a number of devices • I can demonstrate how information can be passed between devices • I can explain the role of a switch, server, and wireless access point in a network	This lesson introduces key network components, including a server and wireless access points. Learners will examine each device's functionality and look at the benefits of networking computers.	
	Week 7	**Connecting computers** What does our school	Network cables, network sockets	To recognise the physical components of a network	Learners will think about the choices that are made when using information technology, and the responsibility associated with those choices. They will use IT in different	

		network look like?		• I can identify how devices in a network are connected together • I can identify networked devices around me • I can identify the benefits of computer networks	types of activities and explain that sometimes they will need to use IT in different ways.	
Autumn 2	Week1	**E-Safety** **Online Relationships**	Lesson 1 – Sharing information online Lesson 2 – Hurtful situations online Lesson 3 – Permission and sharing	• I can describe ways people who have similar likes and interests can get together online. • I can explain what it means to 'know someone' online and why this might be different from knowing someone offline. • I can explain what is meant by 'trusting someone online', why this is different from 'liking someone online', and why it is important to be careful about who to trust online, including what information and content they are trusted with. • I can explain why someone may change their mind about trusting anyone with something if they feel nervous, uncomfortable or worried. • I can explain how someone's feelings can be hurt by what is said or written online. • I can explain the importance of giving and gaining permission before sharing things online and how the principles of sharing online are the same as sharing offline (e.g. sharing images and videos).		
	Week 2	**Stop-frame animations** Can a picture move?	Animation, flip book	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 • I can explain how an animation/flip book works	Learners will discuss whether they think a picture can move. They will learn about simple animation techniques and create their own animations in the style of flip books (flick books) using sticky notes.	Learners will use a range of techniques to create a stop-frame animation using tablets. Next, they will apply those skills to create a story-based animation. This unit will conclude with learners adding other types of media to their animation, such as music and text. It is recommended that you use a tablet for this unit as this makes it simpler for learners to take the photos and do the editing. However, you could use stop-frame animation software on a desktop or laptop if this is what you have available. This unit uses screenshots from iMotion which is an iPad app, but you could also try Stop Motion Studio if you have Android tablets.
	Week 3	**Stop-frame animations** Frame by frame	Stop-frame animation, frame, sequence, image, photograph	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 • I can create an effective stop-frame animation	In the previous lesson, learners created their own flip book–style animations. In this lesson, they will develop this knowledge and apply it to make a stop-frame animation using a tablet.	
	Week 4	**Stop-frame animations** What's the story?	Setting, character, events, stop-frame animation, onion skinning	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	Remind the learners of the animations that we created last week and tell them that next week we will use tablets to animate some of our own stories. Tell the learners that during this lesson they will create a storyboard showing the characters, settings and events that they would like to include in their own stop-frame animation next week.	
	Week 5	**Stop-frame animations** Picture perfect	Stop-frame animation, onion skinning, consistency	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 • I can evaluate the quality of my animation	In the previous lesson, learners planned out their own stop-frame animations in a storyboard. This lesson, they will use tablets to carefully create stop-frame animations, paying attention to consistency.	

	Week 6	**Stop-frame animations** Evaluate and make it great!	Evaluation, animation, onion skinning, delete, frame	To review and improve an animation • I can explain ways to make my animation better • I can evaluate another learner's animation • I can improve my animation based on feedback	Last lesson, learners created their own stop-frame animations. This lesson, they will evaluate their animations and try to improve them by creating a brand-new animation based on their feedback.
	Week 7	**Stop-frame animations** Lights, camera, action!	Animation, media, import, transition	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 • I can evaluate my final film	Last lesson, learners perfected their stop-frame animations. This lesson, they will add other media and effects into their animations, such as music and text.
Spring 1	**Week1**	**E-Safety** **Managing Online Information**	Lesson 1 – Autocomplete Lesson 2 – Facts, opinions and beliefs Lesson 3 – Preferences	• I can demonstrate how to use key phrases in search engines to gather accurate information online. • I can explain what autocomplete is and how to choose the best suggestion. • I can explain how the internet can be used to sell and buy things. • I can explain the difference between a belief, an opinion and a fact and can give examples of how and where they might be shared online (e.g. in videos, memes, posts, news stories). • I can explain that not all opinions shared may be accepted as true or fair by others (e.g. monsters under the bed). • I can describe and demonstrate how we can get help from a trusted adult if we see content that makes us feel sad, uncomfortable worried or frightened.	
	Week 2	**Sequencing sounds** Introduction to scratch	Scratch, programming, blocks, commands, code, sprite, costume, stage, backdrop	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	This lesson introduces learners to a new programming environment: Scratch. Learners will begin by comparing Scratch to other programming environments they may have experienced, before familiarising themselves with the basic layout of the screen.	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. There are two Year 3 programming units:
	Week 3	**Sequencing sounds** Programming sprites	Sprites, programming blocks, motion, turn, point in direction, go to, glide	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	In this lesson, learners will create movement for more than one sprite. In doing this, they will design and implement their code, and then will create code to replicate a given outcome. Finally, they will experiment with new motion blocks.	
	Week 4	**Sequencing sounds** Sequences	Sequence, event, task, design, code, run the code	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	In this lesson, learners will be introduced to the concept of sequences by joining blocks of code together. They will also learn how event blocks can be used to start a project in a variety of different ways. In doing this, they will apply principles of design to plan and create a project.	

	Week 5	**Sequencing sounds** Ordering commands	Sequence, order, note, chord	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	This lesson explores sequences, and how they are implemented in a simple program. Learners have the opportunity to experiment with sequences where order is and is not important. They will create their own sequences from given designs.	• Programming A - Sequencing sounds • Programming B - Events and actions in programs This is unit A which should be delivered before unit B. .
	Week 6	**Sequencing sounds** Looking good	Sprite, stage, costume, backdrop	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	This lesson develops learners' understanding of sequences by giving them the opportunity to combine motion and sounds in one sequence. They will also learn how to use costumes to change the appearance of a sprite, and backdrops to change the appearance of the stage. They will apply the skills in Activity 1 and 2 to design and create their own project, including sequences, sprites with costumes, and multiple backdrops.	
	Week 7	**Sequencing sounds** Making an instrument	Design, algorithm, bug, debug	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	In this lesson, learners will create a musical instrument in Scratch. They will apply the concept of design to help develop programs and use programming blocks — which they have been introduced to throughout the unit. They will learn that code can be copied from one sprite to another, and that projects should be tested to see if they perform as expected.	
Spring 2 **Week 1**	**E-Safety** **Health, Wellbeing & Lifestyle**		Lesson 1 – Activities in my day Lesson 2 – Spending time and positive activities Lesson 3 – Age ratings	• I can explain why spending too much time using technology can sometimes have a negative impact on anyone (e.g. mood, sleep, body, relationships). • I can give some examples of both positive and negative activities where it is easy to spend a lot of time engaged (e.g. doing homework, games, films, videos). • I can explain why some online activities have age restrictions, why it is important to follow them and know who I can talk to if others pressure me to watch or do something online that makes me feel uncomfortable (e.g. age restricted gaming or web sites).	
	Week 2	**Branching databases** Yes or no questions	Attribute, value, questions, table, objects	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	During this lesson, learners will start to explore questions with yes or no answers, and how these can be used to identify and compare objects. They will create their own yes or no questions before using these to split a collection of objects into groups.	During this unit, learners will develop their understanding of what a branching database is and how to create one. They will gain an understanding of what attributes are and how to use them to sort groups of objects by using yes/no questions. The learners will create physical and on-screen branching databases. Finally, they will evaluate the effectiveness of branching databases and will decide what types of data should be presented as a branching database.
	Week 3	**Branching databases** Making groups	Branching database, database, attribute, value, questions, objects, equal, even, separate	To identify the object attributes needed to collect relevant data • 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 structur	During this lesson, learners will continue to develop their understanding of using questions with yes or no answers to group collections of objects. They will learn how to arrange objects in a tree structure and will continue to think about which attributes the questions are related to.	
	Week 4	**Branching databases** Creating a branching database	Branching database, database, attribute, value, questions, objects	To create a branching database • I can select objects to arrange in a branching database • I can group objects using my own yes/no	During this lesson, learners will continue to develop their understanding of ordering objects/images in a branching database structure. They will learn how to use an online database tool to arrange objects into a branching database,	

				questions ●I can prove my branching database works	and will create their own questions with yes or no answers. The learners will show that their branching database works through testing.	
	Week 5	**Branching databases** Structuring a database	Branching database, attribute, questions, structure, compare, order, organise	To explain why it is helpful for a database to be well structured ● I can create yes/no questions using given attributes ● I can explain that questions need to be ordered carefully to split objects into similarly sized groups ● I can compare two branching database structures	During this lesson, learners will continue to develop their understanding of how to create a well-structured database. They will use attributes to create questions with yes or no answers and apply these to given objects. The learners will be able to explain why questions need to be in a specific order and will compare the efficiency of different branching databases.	
	Week 6	**Branching databases** Using a branching database	Branching database, attribute, value, question, j2data, selecting	To identify objects using a branching database ● I can select a theme and choose a variety of objects ● I can create questions and apply them to a tree structure ● I can use my branching database to answer questions	During this lesson, learners will independently create a branching database that will identify a given object. They will continue to think about the attributes of objects to write questions with a yes or no answer, which will enable them to separate a group of objects effectively. The learners will then arrange the questions and objects into a tree structure, before using their branching database to answer questions.	
	Week 7	**Branching databases** Presenting information	Branching database, attribute, value, questions, j2data, pictogram, compare, information, decision tree	To compare the information shown in a pictogram with a branching database ● I can explain what a pictogram tells me ● I can explain what a branching database tells me ● I can compare two ways of presenting information	During this lesson, the learners will compare two ways of presenting information. They will demonstrate their ability to explain what information is shown in a pictogram and a branching database. The learners will begin to compare the two ways of presenting information.	
Summer 1	Week 1	**E-Safety** **Privacy & Security**	Lesson 1 – Keeping passwords private Lesson 2 – Reporting and blocking Lesson 3 – Collecting data	● I can describe simple strategies for creating and keeping passwords private. ● I can give reasons why someone should only share information with people they choose and can trust. ● I can explain that if they are not sure or feel pressured, they should tell a trusted adult. ● I can describe how connected devices can collect and share anyone's information with others.		
	Week 2	**Desktop publishing** Words and pictures	Text, images, advantages, disadvantages, communicate	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	In this lesson, learners will become familiar with the terms 'text' and 'images' and understand that text and images need to be used carefully to communicate messages clearly. Learners will be able to give advantages and disadvantages of using text, images, or both text and images to communicate messages effectively.	

	Week 3	**Desktop publishing** Can you edit it?	Font, font style, communicate, template	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	This lesson will build on last week's lesson, in which we looked at using images and text to communicate a message effectively. In this lesson we will look at desktop publishing. Learners will think about how to make careful choices regarding font size, colour, and type in an invitation. The use of the Return, Backspace, and Shift keys will be explored and learners will be taught how to type age-appropriate punctuation marks. This will build on the typing skills learned in the Year 1 'Digital painting' unit. Learners will understand that once content has been added, it can be rearranged on the page.	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. The suggested application for this unit is Adobe Spark. To use Spark accounts are needed for learners. A guide to creating accounts is provided in lesson 2. Adobe Spark is web based and can be used on tablets, desktops and laptops.
	Week 4	**Desktop publishing** Great template!	Landscape, portrait, orientation, placeholder, template, layout, content	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	Learners will be introduced to the terms 'templates', 'orientation', and 'placeholders' within desktop publishing software. The learners will create their own magazine template, which they will add content to during the next lesson. This lesson has been designed on a laptop using Adobe Spark and this is reflected in the screenshots and videos. Teachers may decide to use the Adobe Spark app, or other software such as Canva or Microsoft Publisher.	
	Week 5	**Desktop publishing** Can you add content?	Desktop publishing, copy, paste	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	In this lesson, learners will add their own content (text and images) to the magazine templates they created in lesson 3. They will copy the information for the front of their magazine from a prewritten document and paste it into the chosen place on their magazine cover. Images will be added from within the search facility in Adobe Spark. Teachers could ask learners to gather copyright-free images from http://www.pixabay.com if using a different application.	
	Week 6	**Desktop publishing** Lay it out	Layout, purpose	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	In this lesson, learners will think about the different ways information can be laid out on a page. They will look at a range of page layouts such as letters and newspapers, and begin to think about the purpose of each of these.	
	Week 7	**Desktop publishing** Why desktop publishing?	Desktop publishing, benefits	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	In this lesson, learners will explain what desktop publishing means in their own words. They will think about how desktop publishing is used in the wider world and consider the benefits of using desktop publishing applications.	
	Summer 2 Week 1	**E-Safety** **Copyright & Ownership**	Lesson 1 – My digital work Lesson 2 – Saving my digital work	• I can explain why copying someone else's work from the internet without permission isn't fair and can explain what problems this might cause.		

	Week	Title	Vocabulary	Objectives	Description	Unit overview
	Week 2	**Events and actions in programs** Moving a spire	Motion, event, sprite, algorithm, logic	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	In this lesson, learners will investigate how characters can be moved using 'events'. They will analyse and improve an existing project, and then apply what they have learned to their own projects. They will then extend their learning to control multiple sprites in the same project.	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.
	Week 3	**Events and actions in programs** Maze movement	Move, resize, algorithm	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	In this lesson, learners will program a sprite to move in four directions: up, down, left, and right. They will begin by choosing a sprite and sizing it to fit in with a given background. Learners will then create the code to move the sprite in one direction before duplicating and modifying it to move in all four directions. Finally, they will consider how their project could be extended to prove that their sprite has successfully navigated a maze.	
	Week 4	**Events and actions in programs** Drawing lines	Extension block, pen up, set up	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	This lesson will introduce learners to extension blocks in Scratch using the **Pen** extension. Learners will use the pen down block to draw lines, building on the movement they created for their sprite in Lesson 2. Learners will then decide how to set up their project every time it is run.	There are two Year 3 programming units: ● Programming A – Sequencing sounds ● Programming B – Events and actions in programs This is unit B, which should be delivered after unit A.
	Week 5	**Events and actions in programs** Adding features	Pen, design, event, action, algorithm	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	In this lesson, learners will be given the opportunity to use additional **Pen** blocks. They will predict the functions of new blocks and experiment with them, before designing features to add to their own projects. Finally, they will add these features to their projects and test their effectiveness.	
	Week 6	**Events and actions in programs** Debugging movement	Debugging, errors, setup	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	This lesson explores the process of debugging, specifically looking at how to identify and fix errors in a program. Learners will review an existing project against a given design and identify bugs within it. They will then correct the errors, gaining independence as they do so. Learners will also develop their projects by considering which new setup blocks to use.	
	Week 7	**Events and actions in programs** Making a project	Design, code, setup, test, debug, actions, events	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	In this lesson, learners will design and create their own projects. Using a template (which can be blank or partially completed), learners will complete projects to move a sprite around a maze, with the option to leave a pen trail showing where the sprite has moved. Ideally, projects will include setup blocks to position the sprite at the start of the maze and clear any lines already on the screen.	

Barham Primary School – Computing Year 4

Statutory guidance - National curriculum in England: <u>computing</u> programmes of study   **Updated 30th August 2024**

<u>Purpose of study</u>
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.

<u>Aims</u>
The national curriculum for computing aims to ensure that all pupils:
▪ can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
▪ can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
▪ can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
▪ are responsible, competent, confident and creative users of information and communication technology.

Key stage 2

<u>Pupils should be taught to:</u>

- 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.

Term	Week	Topic/Lesson	Key Vocabulary	Intent	Implementation	Impact
Autumn 1	Week 1	**<u>E-Safety</u>** **<u>Self-image & Identity</u>**	Lesson 1 – My online and offline identities Lesson 2 – Positive interactions Lesson 3 – Identity theft	• I can explain how my online identity can be different from my offline identity. • I can describe positive ways for someone to interact with others online and understand how this will positively impact on how others perceive them. I can explain that others online can pretend to be someone else, including my friends, and I can suggest reasons why they might do this.		
	Week 2	**<u>The internet</u>**	Internet, network, router, network security	To describe how networks physically connect	Learners will explore how a network can share messages with another network to form the internet. They will	Learners will apply their knowledge and understanding of

		Connecting networks		to other networks - I can describe the internet as a network of networks - I can demonstrate how information is shared across the internet - I can discuss why a network needs protecting	consider some of the network devices involved in this, such as routers, and will also discuss what should be kept in and out of a network to keep safe.	networks, to appreciate the internet as a network of networks which need to be kept secure. They will learn that the World Wide Web is part of the internet, and will be given opportunities to explore the World Wide Web for themselves in order to learn about who owns content and what they can access, add, and create. Finally, they will evaluate online content to decide how honest, accurate, or reliable it is, and understand the consequences of false information. This unit requires devices with an internet connection. Chrome Music Lab is used in one lesson to demonstrate content which can be produced on the World Wide Web.
Week 3	**The internet** **What is the internet made of?**	Network switch, server, wireless access point (WAP), router	To recognise how networked devices make up the internet - I can describe networked devices and how they connect - I can explain that the internet is used to provide many services - I can recognise that the World Wide Web contains websites and web pages	Learners will describe the parts of a network and how they connect to each other to form the internet. They will use this understanding to help explain how the internet lets us view the World Wide Web and recognise that the World Wide Web is part of the internet which contains websites and web pages.	
Week 4	**The internet** **Sharing information**	Website, web page, web address, router, routing, web browser	To outline how websites can be shared via the World Wide Web (WWW) - I can explain the types of media that can be shared on the WWW - I can describe where websites are stored when uploaded to the WWW - I can describe how to access websites on the WWW	Learners will explore what can be shared on the World Wide Web and where websites are stored. They will also explore how the World Wide Web can be accessed on a variety of devices.	
Week 5	**The internet** **What is a website?**	World Wide Web, internet, content, website, web page, links, files	To describe how content can be added and accessed on the World Wide Web (WWW) - I can explain what media can be found on websites - I can recognise that I can add content to the WWW - I can explain that internet services can be used to create content online	Learners will analyse a website and identify the key parts. They will then consider what content can be added to websites and what factors they should consider before adding content to a website. Finally, they will use a website which enables them to create their own content online.	
Week 6	**The internet** **Who owns the web?**	Website, use, content, download, sharing, ownership, permission	To recognise how the content of the WWW is created by people - I can explain that websites and their content are created by people - I can suggest who owns the content on websites - I can explain that there are rules to protect content	Learners will explore who owns the content on the World Wide Web (or 'web' for short). They will explore a variety of websites and will investigate what they can and cannot do with the content on them. They will also relate this to principles of ownership and sharing in the real world.	
Week 7	**The internet** **Can I believe what I read?**	Information, sharing, accurate, honest, content, adverts	To evaluate the consequences of unreliable content	Learners will gain an appreciation of the fact that not everything they see on the internet is true, honest, or accurate. They will review images and decide whether or not they are real, before looking at why web searches can	

				• I can explain that not everything on the World Wide Web is true • I can explain why some information I find online may not be honest, accurate, or legal • I can explain why I need to think carefully before I share or reshare content	return ambiguous (and sometimes misleading) results. Finally, learners will complete a practical activity, demonstrating how quickly information can spread beyond their control.	
	Autumn 2 **Week1**	**E-Safety** **Online Relationships**	Lesson 1 – Online friends Lesson 2 – Healthy online behaviour Lesson 3 – Respect and privacy	• I can describe strategies for safe and fun experiences in a range of online social environments (e.g. livestreaming, gaming platforms). • I can give examples of how to be respectful to others online and describe how to recognise healthy and unhealthy online behaviours. • I can explain how content shared online may feel unimportant to one person but may be important to other people's thoughts, feelings and beliefs.	
	Week 2	**Audio editing** **Digital recording**	Audio, microphone, speaker, headphones, input device, output device	To identify that sound can be digitally recorded: • I can identify digital devices that can record sound and play it back • I can identify the inputs and outputs required to play audio or record sound • I can recognise the range of sounds that can be recorded	In this lesson, learners will familiarise themselves with digital devices capable of recording sound and/or playing audio. Learners will identify devices' inputs (microphone) and outputs (headphones or speakers). Learners will consider ownership and copyright issues relating to the recording of audio.	In this unit, learners will initially examine devices capable of recording digital audio, which will include identifying the input device (microphone) and output devices (speaker or headphones) if available. 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.
	Week 3	**Audio editing** **Recording sound**	Audio, sound, podcast, edit, trim, align	To use a digital device to record sound: • I can use a device to record audio and play back sound • I can suggest how to improve my recording • I can discuss what other people include when recording sound for a podcast	In this lesson, learners will record their own sounds and play back the recorded audio. They will also listen to a range of podcasts and identify the features of a podcast.	
	Week 4	**Audio editing** **Creating a podcast**	Audio, sound, layer, import	To explain that a digital recording is stored as a file: • I can plan and write the content for a podcast • I can discuss why it is useful to be able to save digital recordings • I can save a digital recording as a file	In this lesson, learners will plan and begin recording their own podcast. They will also discuss the importance of saving their work and save their recordings as a file. **Note:** Due to the amount of time required to plan the podcast content, the written parts of the planning template could be completed in a different subject's lesson (e.g. English, or a subject related to the podcast content).	
	Week 5	**Audio editing** **Editing digital recordings**	Audio, sound, record, playback, edit, selection	To explain that audio can be changed through editing: • I can open a digital recording from a file • I can discuss ways in which audio recordings can be altered • I can edit sections of an audio recording	In this lesson, learners will open their existing work and continue recording their podcast content. Learners will also edit their recordings, for example by changing the volume of the recording or making the recording fade in or out.	
	Week 6	**Audio editing**	Audio, sound, load, import, save, export, MP3	To show that different types of audio can be combined and played together:	In this lesson, learners will record additional content for their podcast, such as sound effects or background music.	

		Combining audio		• I can discuss sounds that other people combine • I can choose suitable sounds to include in a podcast • I can use editing tools to arrange sections of audio	The audio will be combined, or mixed, with their existing digital recordings and exported as an audio file.	
	Week 7	**Audio editing** **Evaluating podcasts**	Export, MP3, audio, editing, evaluate, feedback	To evaluate editing choices made: • I can explain that digital recordings need to be exported to share them • I can discuss the features of a digital recording I like • I can suggest improvements to a digital recording	In this lesson, learners will export their digital recordings so that they can be listened to on a range of digital devices. Learners will give feedback on their own and their peers' podcasts, including areas for improvement.	
Spring 1	Week 1	**E-Safety** **Managing Online Information**	Lesson 1 – Adverts online Lesson 2 – Searching for reliable information Lesson3 – Adverts and pop-ups	• I can analyse information to make a judgement about probable accuracy, and I understand why it is important to make my own decisions regarding content and that my decisions are respected by others. • I can describe how to search for information within a wide group of technologies and make a judgement about the probable accuracy (e.g. social media, image sites, video sites). • I can describe some of the methods used to encourage people to buy things online (e.g. advertising offers, in-app purchases, pop-ups) and can recognise some of these when they appear online. • I can explain why lots of people sharing the same opinions or beliefs online do not make those opinions or beliefs true. • I can explain that technology can be designed to act like, or impersonate, living things (e.g. bots) and describe what the benefits and the risks might be. • I can explain what is meant by fake news; for example, why some people will create stories or alter photographs and put them online to pretend something is true when it isn't.		
	Week 2	**Repetition in shapes** **Programming a screen turtle**	Program Turtle — an arrow or turtle image on screen that draws a line as it is programmed Commands Code snippet — this could be the same as a program; it can have several sets of commands in one program	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	This lesson will introduce pupils to programming in Logo. Logo is a text-based programming language where pupils type commands that are then drawn on screen. Pupils will learn the basic Logo commands, and will use their knowledge of them to read and write code.	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 There are two Year 4 programming units: • Programming A – Repetition in shapes • Programming B – Repetition in games This is unit A, which should be delivered before unit B.
	Week 3	**Repetition in shapes** **Programming letters**	Algorithm — the part of the design of the program that is precise instructions to be implemented as code Design Debug — the process of finding and correcting errors in your code Logo commands as detailed in the 'Glossary' handout.	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	In this lesson, pupils will create algorithms (a precise set of ordered instructions, which can be turned into code) for their initials. They will then implement these algorithms by writing them in Logo commands to draw the letter. They will debug their code by finding and fixing any errors that they spot.	
	Week 4	**Repetition in shapes** **Patterns and repeats**	Pattern, repeat, repetition, count-controlled loop, algorithm, value	To explain what 'repeat' means • I can identify repetition in everyday tasks	In this lesson, pupils will first look at examples of patterns in everyday life. They will recognise where numbers, shapes, and symbols are repeated, and how many times repeats occur. They will create algorithms for drawing a	

					square, using the same annotated diagram as in Lesson 2. They will use this algorithm to program a square the 'long' way, and recognise the repeated pattern within a square. Once they know the repeated pattern, they will use the repeat command within Logo to program squares the 'short' way.	You can use either a tablet, desktop or laptop computer for this unit. Logo software should be installed or accessible online, for example:
			• I can identify patterns in a sequence • I can use a count-controlled loop to produce a given outcome			○ https://www.transum.org/software/Logo/
	Week 5	**Repetition in shapes** **Using loops to create shapes**	Repeat, repetition, count-controlled loop, trace, value	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	In this lesson, pupils will work with count-controlled loops in a range of contexts. First, they will think about a real-life example, then they will move on to using count-controlled loops in regular 2D shapes. They will trace code to predict which shapes will be drawn, and they will modify existing code by changing values within the code snippet.	
	Week 6	**Repetition in shapes** **Breaking things down**	Repeat Count-controlled loop Decompose — break something down into smaller parts Procedure — a named code snippet that can be run multiple times	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	In this lesson, pupils will focus on decomposition. They will break down everyday tasks into smaller parts and think about how code snippets can be broken down to make them easier to plan and work with. They will learn to create, name, and call procedures in Logo, which are code snippets that can be reused in their programming.	
	Week 7	**Repetition in shapes** **Creating a program**	Count-controlled loop Procedure — a named code snippet that can be run multiple times Debug — the process of finding and correcting errors in your code Program — the entire solution to the task, and an implementation of the algorithm as code	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	In the final lesson, pupils will apply the skills that they have learnt in this unit to create a program containing a count-controlled loop. Over the course of the lesson, they will design wrapping paper using more than one shape, which they will create with a program that uses count-controlled loops. They will begin by creating the algorithm, either as an annotated sketch, or as a sketch and algorithm, and then implement it as code. They will debug their work throughout, and evaluate their programs against the original brief.	
	Spring 2 Week 1	**E-Safety** **Health, Wellbeing & Lifestyle**	Lesson 1 – Being healthy online Lesson 2 – Taking care of your mind Lesson 3 – Our free time	• I can explain how using technology can be a distraction from other things in a positive and negative way. I can identify times or situations when someone may need to limit the amount of time they use technology. For example, I can suggest strategies to help with limiting this time.		
	Week 2	**Data logging** **Answering questions**	Data, table (layout)	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	This lesson will set the scene for the unit of work. Pupils will consider what data can be collected and how it is collected. They will think about data being collected over time. Pupils will also think about questions that can and can't be answered using available data, and reflect on the importance of collecting the right data to answer questions. Later in the unit, pupils will put into practice the ideas that they have thought about in this lesson.	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

					• I can identify data that can be gathered over time	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.
	Week 3	**Data logging** **Data collection**	Input device, sensor, data logger	To use a digital device to collect data automatically • I can explain that sensors are input devices • I can use data from a sensor to answer a given question • I can identify that data from sensors can be recorded	This lesson will build on the idea of collecting data over time, and introduce the idea of collecting data automatically using computers. Computers can capture data from the physical world using input devices called 'sensors'. Sensors can be connected to data loggers, which can collect data while not attached to a computer. Data collected by a data logger can be downloaded for use later.	
	Week 4	**Data logging** **Logging**	Data logger, logging, data point, interval	To explain that a data logger collects 'data points' from sensors over time • I can identify a suitable place to collect data • I can identify the intervals used to collect data • I can talk about the data that I have captured	In this lesson, pupils will explore how data loggers work. Pupils will try recording data at set moments in time and draw parallels with the data points that a data logger captures at regular intervals. Pupils will use data loggers independently from a computer, then they will connect the loggers to a computer and download the data.	Note: Your school may not have the same data loggers as those used in this unit, or may not have any data loggers at all. If you don't have access to data loggers, a lot of the activities can be completed using tablet computers and apps such as Google Science Journal. Whichever data logging solution you have available, you should be able to address the learning objectives in the unit.
	Week 5	**Data logging** **Analysing data**	Analyse, data set, import, export	To use data collected over a long duration to find information • I can import a data set • I can use a computer to view data in different ways • I can use a computer program to sort data	In this lesson, pupils will open an existing data file and use software to find out key information. The data file is a five-hour log of hot water cooling to room temperature. **Note:** The logged activity can't be done safely in school due to the high starting temperature. Later in the unit, pupils may choose to complete a warming experiment, starting with ice and allowing it to warm to room temperature.	Children will learn to use the micro:bits for data logging and analysis.
	Week 6	**Data logging** **Data for answers**	Data, data logger, logged, collection	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	In this lesson, pupils will think about questions that can be answered using collected data. Pupils will choose a question to focus on and then plan the data logging process that they need to complete. After they have completed their plan, they will set up the data loggers to check that their plan will work. This setting up is designed to ensure that the data collection will work, and that pupils will have data to use in Lesson 6.	
	Week 7	**Data logging** **Answering my question**	Analyse, review, conclusion	To use collected data 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	In this lesson, pupils will access and review the data that they have collected using a data logger. They will then use the data collected to answer the question that they selected in Lesson 5. Pupils will also reflect on the benefits of using a data logger.	
Summe	Week 1	**E- Safety**	Lesson 1 – Making choices	• I can describe strategies for keeping personal information private, depending on context.		

30

r 1		**Privacy & Security**	Lesson 2 – Data saved online Lesson 3 – Consent online	• I can explain that internet use is never fully private and is monitored. • I can describe how some online services may seek consent to store information about me. I know how to respond appropriately and who I can ask if I am not sure. • I know what the digital age of consent is and the impact this has on online services asking for consent.	
	Week 2	**Photo editing** **Changing digital images**	Image, edit, arrange, select, digital, crop, undo, save	To explain that digital images can be changed • I can identify changes that we can make to an image • I can explore how images can be changed in real life • I can explain the effect that editing can have on an image	In this lesson, learners will be introduced to the online editor, and changes that can be made to images using a range of tools. They will look at changing the composition of images using the 'crop' tool, and evaluate the effect that this can have on an image.	In this unit, 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.
	Week 3	**Photo editing** **Changing the composition of images**	Image, search, save, copyright, composition, edit, save, pixels, crop, rotate, flip	To change the composition of an image • I can explain what has changed in an edited image • I can change the composition of an image by selecting parts of it • I can consider why someone might want to change the composition of an image	In this lesson, learners will identify changes that have been made to edited images. They will search for and save images from a copyright-free website. Learners will then use an image editor to make a new image composition linked to a cross-curricular theme.	
	Week 4	**Photo editing** **Changing images for different uses**	Image, adjustments, effects, colours, hue/saturation, sepia, save, version, illustrator, vignette	To describe how images can be changed for different uses • I can talk about changes made to images • I can choose effects to make my image fit a scenario • I can explain why my choices fit a scenario	In this lesson, learners will look at the effect that different colours and filters can have on an image. They will choose appropriate effects to fit a scenario, and explain how they made their choices. They will then edit the same original image using different effects to suit two different scenarios, and compare the two versions.	
	Week 5	**Photo editing** **Retouching images**	Image, edit, retouch, clone, recolour, magic wand, select, adjust, sharpen, brighten	To make good choices when selecting different tools • I can identify how an image has been retouched • I can give examples of positive and negative effects that retouching can have on an image • I can choose appropriate tools to retouch an image	This lesson is based on editing images by using retouching tools. Learners will consider why people may choose to retouch images, and the positive and negative effects that retouching can have on images. They will use retouching tools to improve images, and consider which tools are appropriate for retouching.	
	Week 6	**Photo editing** **Fake images**	Image, fake, real, composite, cut, copy, paste, alter, background, foreground	To recognise that not all images are real • I can sort images into 'fake' or 'real' and explain my choices • I can combine parts of images to create new images • I can talk about fake images around me	This lesson is based on the concept of fake images. Learners will sort images into 'fake' and 'real', and give reasons for their decisions. They will create their own fake images and reflect on how easy it is to digitally alter images, and what this might mean for the images that they see around them.	

	Week	Topic	Vocabulary	Objectives	Description	Notes
	Week 7	**Photo editing** **Making and evaluating a publication**	Image, publication, elements, original, font style, shapes, border, layer,	To evaluate how changes can improve an image • I can consider the effect of adding other elements to my work • I can compare the original image with my completed publication • I can evaluate the impact of my publication on others through feedback	This lesson is the final lesson in the unit on photo editing. Learners will use the 'fake' image that they created in lesson 5 to make a publication designed to advertise their imaginary place. They will add elements such as text, shapes, and borders. They will design a survey for gaining feedback on their work, and compare their completed publications with the original images.	
	Summer 2 **Week1**	**E-Safety** **Copyright & Ownership**	Lesson 1 – The impact of plagiarism Lesson 2 – Can I use other people's work? Lesson 3 – Copyright and usage rights	• When searching on the internet for content to use, I can explain why I need to consider who owns it and whether I have the right to reuse it. I can give some simple examples of content which I must not use without permission from the owner (e.g. videos, music, images).		
	Week 2	**Repetition in games** **Using loops to create shapes**	Scratch, programming, sprite, blocks, code, loop, repeat, value	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	In the first lesson, learners look at real-life examples of repetition, and identify which parts of instructions are repeated. Learners then use Scratch, a block-based programming environment, to create shapes using count-controlled loops. They consider what the different values in each loop signify, then use existing code to modify and create new code, and work on reading code and predicting what the output will be once the code is run.	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.
	Week 3	**Repetition in games** **Different loops**	Block, repeat, forever, infinite loop, count-controlled loop, costume	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 and an infinite loop • I can recognise that some programming languages enable more than one process to be run at once	In this lesson, learners look at different types of loops: infinite loops and count-controlled loops. They practise using these within Scratch and think about which might be more suitable for different purposes.	
	Week 4	**Repetition in games** **Animate your name**	Repetition, forever, infinite loop, count-controlled loop, animate, costume, event block, duplicate	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	In this lesson, learners create designs for an animation of the letters in their names. The animation uses repetition to change the costume (appearance) of the sprite. The letter sprites will all animate together when the **event** block (**green flag**) is clicked. When they have designed their animations, the learners will program them in Scratch. After programming, learners then evaluate their work, considering how effectively they used repetition in their code.	There are two Year 4 programming units: • Programming A — Repetition in shapes • Programming B — Repetition in games This is unit B, which should be delivered after unit A.
	Week 5	**Repetition in games** **Modifying a game**	Block, repeat, forever, infinite loop, modify, design	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	In this lesson, learners look at an existing game and match parts of the game with the design. They make changes to a sprite in the existing game to match the design. They then look at a completed design, and implement the remaining changes in the Scratch game. They add a sprite, re-use and	It is recommended that learners use desktop or laptop computers to access Scratch (scratch.mit.edu). We recommend

				• I can re-use existing code snippets on new sprites	modify code blocks within loops, and explain the changes made.	the use of teacher accounts in Scratch to make it easier to manage student accounts. For guidance on setting up teacher accounts, please visit the Scratch website. (https://scratch.mit.edu/educators/faq)
	Week 6	**Repetition in games** **Designing a game**	Infinite loop, count-controlled loop, repetition, design, sprite, algorithm	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	In this lesson, learners look at a model project that uses repetition. They then design their own games based on the model project, producing designs and algorithms for sprites in the game. They share these designs with a partner and have time to make any changes to their design as required.	
	Week 7	**Repetition in games** **Creating your games**	Repetition, design, algorithm, duplicate, debug, refine, evaluate	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	In this lesson, learners build their games, using the designs they created in Lesson 5. They follow their algorithms, fix mistakes, and refine designs in their work as they build. They evaluate their work once it is completed, and showcase their games at the end.	Throughout this unit, there are opportunities to model within Scratch or to demonstrate a concept through a video. Pedagogically, it is more beneficial to model the concepts to the learners, which allows for easier questioning and understanding. We recommend that you use the videos to see what needs to be modelled, but give a live demonstration within the lesson. However, the videos are provided on the slides if you wish to use them instead.

Barham Primary School – Computing Year 5

Statutory guidance - National curriculum in England: <u>computing</u> programmes of study   **Updated 30th August 2024**

<u>**Purpose of study**</u>
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.

<u>**Aims**</u>
The national curriculum for computing aims to ensure that all pupils:
▪ can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
▪ can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
▪ can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
▪ are responsible, competent, confident and creative users of information and communication technology.

Key stage 2

<u>**Pupils should be taught to:**</u>

- 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.

Term	Week	Topic/Lesson	Key Vocabulary	Intent	Implementation	Impact
	Autumn 1 Week 1	**Self-image & Identity**	Lesson 1 – Copy, modify, alter Lesson 2 – Creating a digital avatar Lesson 3 – Photos online	• I can explain how identity online can be copied, modified or altered. I can demonstrate how to make responsible choices about having an online identity, depending on context.		

	Week 1	**Sharing information** Systems	System, connection, digital, input, process, output	To explain that computers can be connected together to form systems • I can explain that systems are built using a number of parts • I can describe that a computer system features inputs, processes, and outputs I can explain that computer systems communicate with other devices	This lesson introduces learners to the concept of a system. Learners will develop their understanding of components working together to make a whole. They will outline how digital systems might work and the physical and electronic connections that exist.	In this unit, learners will develop their understanding of computer systems and how information is transferred between systems and devices. Learners will consider small-scale systems as well as large-scale systems. They will explain the input, output, and process aspects of a variety of different real-world systems. Learners will also take part in a collaborative online project with other class members and develop their skills in working together online.
	Week 2	**Sharing information** Computer systems and us	System, connection, digital, input, process, output	To recognise the role of computer systems in our lives • I can identify tasks that are managed by computer systems • I can identify the human elements of a computer system • I can explain the benefits of a given computer system	In this lesson, learners will consider how larger computer systems work. Learners will consider how devices and processes are connected. They will also reflect on how computer systems can help us.	
	Week 3	**Sharing information** Transferring information	Protocol, address, packet	To recognise how information is transferred over the internet • I can recognise that data is transferred using agreed methods • I can explain that networked digital devices have unique addresses • I can explain that data is transferred over networks in packets	This lesson introduces the idea that parts of a computer system are not always in the same place or country. Instead, those parts of a system must transfer information using the internet. This lesson builds on the introduction to the internet in the Year 4 'What is the internet?' unit, adding awareness of IP addresses and the rules (protocols) that computers have for communicating with one another.	
	Week 4	**Sharing information** Working together	Chat, explore, slide deck	To explain how sharing information online lets people in different places work together • I can recognise that connected digital devices can allow us to access shared files stored online • I can send information over the internet in different ways • I can explain that the internet allows different media to be shared	In this lesson, learners will consider how people can work together when they are not in the same location. They will discuss ways of working and start a collaborative online project. The online activity assumes that learners can make simple slides including text and images. If your learners are unsure how to do this, you may wish to spend some time on the Year 3 'Desktop publishing' unit before this lesson.	
	Week 5	**Sharing information** Better working together	Chat, explore	To contribute to a shared project online • I can suggest strategies to ensure successful group work • I can make thoughtful suggestions on my group's work • I can compare working online with working offline	In this lesson, learners will reflect on how they worked together in the previous lesson and how their working together might be improved. Learners will work together on an unplugged activity and use that experience to develop their own ideas of good collective working practices.	
	Week 6	**Sharing information**	Reuse, remix, collaboration	To evaluate different ways of working together online	In the previous two lessons, learners worked together online on a shared project. This lesson introduces another approach to online working: reusing and modifying work	

		Shared working		• I can identify different ways of working together online • I can recognise that working together on the internet can be public or private • I can explain how the internet enables effective collaboration	done by someone else. (Using someone else's work needs to be done within the bounds of copyright and with the relevant permissions.) This lesson uses the Scratch programming tool, which allows learners to use other people's work.	
	Autumn 2 **Week 1**	<u>**E-Safety**</u> <u>**Online Relationships**</u>	Lesson 1 – Strangers online Lesson 2 – Emojis Lesson 3 – Our communities	• I can give examples of technology-specific forms of communication (e.g. emojis, memes and GIFs). • I can explain that there are some people I communicate with online who may want to do me or my friends harm. I can recognise that this is not my/our fault. • I can describe some of the ways people may be involved in online communities and how they might collaborate constructively with others and make positive contributions. (e.g. gaming communities and social media groups). • I can explain how someone can get help if they are having problems and identify when to tell a trusted adult. I can demonstrate how to support others (including those who are having difficulties) online.	
	Week 2	<u>**Vector drawing**</u> The drawing tools	Vector, drawing tools, object, toolbar	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	In this lesson, learners are introduced to vector drawings and begin to understand that they are made up of simple shapes and lines. They use the main drawing tools within the Google Drawings application to create their own vector drawings. Learners discuss how vector drawings differ from paper-based drawings.	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.
	Week 3	<u>**Vector drawing**</u> Creating images	Vector drawing, object, move, resize, colour, rotate, duplicate/copy	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	In this lesson, learners begin to identify the shapes that are used to make vector drawings. They are able to explain that each element of a vector drawing is called an object. Learners create their own vector drawing by moving, resizing, rotating, and changing the colours of a selection of objects. They also learn how to duplicate the objects to save time.	Note: This unit is planned using the Google Drawings application. All Google Drawings files are provided in the lesson plans (the links create a copy of the drawing that can be edited). However, if you wish to use a different vector drawing program, all of the resources are included in the folders as Google Slides presentations. The contents of these files can be copied across to your preferred program.
	Week 4	<u>**Vector drawing**</u> Making effective drawings	Zoom, select, rotate, object, align, resize, modify	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	Learners increase the complexity of their vector drawings and use the zoom tool to add detail to their work. They are shown how grids and resize handles can improve the consistency of their drawings. Learners also use tools to modify objects to create a new image.	
	Week 5	<u>**Vector drawing**</u> Layers and objects	Layers, object, order	To recognise that vector drawings consist of layers • I can identify that each added object creates a new layer in the drawing	Learners gain an understanding of layers and how they are used in vector drawings. They discover that each object is built on a new layer and that these layers can be moved forwards and backwards to create effective vector drawings.	In order to demonstrate the tools and skills involved in vector drawings, it is

36

				• I can change the order of layers in a vector drawing I can use layering to create an image		recommended that you use a vector drawing program, such as Vectr. While the resources could be used in the Google Slides files, it is important that learners recognise that true vector drawings are made using a vector drawing program.
	Week 6	**Vector drawing** Manipulating objects	Copy, paste, group, ungroup, duplicate, object, vector drawing, reuse	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	Learners find out how to select and duplicate multiple objects at a single time. They develop this skill further by learning how to group multiple objects to make them easier to work with. Learners then use this knowledge to group and ungroup objects, in order to make changes to and develop their vector drawings.	
	Week 7	**Vector drawing** Creating a vector drawing	Reflection, 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	Learners use the skills they have gained in this unit to create a vector drawing for a specific purpose. They reflect on the skills they have used to create the vector drawing and think about why they used the skills they did. Learners then begin to compare vector drawings to freehand paint program drawings.	
Spring 1	Week 1	**E-Safety** **Managing Online Information**	Lesson 1 – Trustworthy content Lesson 2 – Targeted adverts Lesson 3 – Assessing online information	• I can explain the benefits and limitations of using different types of search technologies such as voice-activation search engines. I can explain how some technology can limit the information I am presented with, for example voice-activated searching giving one result. • I can explain what is meant by 'being sceptical'; I can give examples of when and why it is important to be sceptical. • I can evaluate digital content and can explain how to make choices about what is trustworthy, for example differentiating between adverts and search results. • I can explain key concepts, including information, reviews, fact, opinion, belief, validity, reliability and evidence. • I can identify ways the internet can draw us to information for different agendas (e.g. website notifications, pop-ups, targeted ads). • I can describe ways of identifying when online content has been commercially sponsored or boosted (e.g. by commercial companies or by vloggers, content creators, influencers). • I can explain what is meant by the term 'stereotype', how stereotypes are amplified and reinforced online and why accepting stereotypes may influence how people think about others. • I can describe how fake news may affect someone's emotions and behaviour and explain why this may be harmful. I can explain what is meant by a hoax. I can explain why someone would need to think carefully before they share.		
	Week 2	**Selection in physical computing** Connecting Crumbles		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	In this lesson, your learners will become familiar with the Crumble controller and the programming environment used to control it. Learners will connect a Sparkle to a Crumble and then program the Crumble to make the Sparkle flash different colour patterns. Learners will also use infinite loops, which were introduced to the learners in the previous school year.	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

	Week 3	**Selection in physical computing** Combining output components		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	In this lesson, learners will connect a Sparkle and a motor to the Crumble controller. Learners will design sequences of actions for these components. They will then apply their understanding of repetition by using count-controlled loops when implementing their design as a program.	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 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.
	Week 4	**Selection in physical computing** Controlling with conditions		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	In this lesson, learners will be introduced to conditions, and how they can be used in programs to control their flow. They will identify conditions in statements, stating if they are true or false. Learners will be introduced to a Crumble switch, and learn how it can provide the Crumble controller with an input that can be used as a condition. They will explore how to write programs that use an input as a condition.	
	Week 5	**Selection in physical computing** Starting with selection		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	In this lesson, learners will develop their understanding of how the flow of actions in algorithms and programs can be controlled by conditions. They will be introduced to selection and then represent conditions and actions using the 'if…then…' structure. Learners will create algorithms that include selection. They will use their algorithms to guide their program writing. Learners will see that infinite repetition is required to repeatedly check if a condition has been met.	
	Week 6	**Selection in physical computing** Drawing designs		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	In this lesson, learners will apply their understanding of microcontrollers and selection when designing a project to meet the requirements of a given task. To support their understanding, learners will identify how selection might be used in real-world situations, then they will consider how they can apply this knowledge to design their project. Learners will produce design sketches to show how their model will be made and how they will connect the microcontroller to its components.	
	Week 7	**Selection in physical computing** Writing and testing algorithms		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	In this final lesson of the unit, learners will develop Crumble programs to control the model of a fairground ride they built in Lesson 5. First, learners will identify how they are going to use selection before writing an algorithm to meet the requirements of the given task. They will then implement their algorithms as code. Learners will run their programs to identify any bugs, and then return to the code or algorithm to debug it where necessary. Finally, to conclude the unit, learners will evaluate their designs.	

	Spring 2 **Week 1**	**E-Safety** **Health, Wellbeing & Lifestyle**	Lesson 1 – The pros and cons of being online Lesson 2 – Looking after our mental health Lesson 3 – Spending money in games	• I can describe ways technology can affect health and well-being positively (e.g. mindfulness apps) and negatively. • I can describe some strategies, tips or advice regarding technology to promote health and wellbeing. • I recognise the benefits and risks of accessing information about health and well-being online and how we should balance this with talking to trusted adults and professionals. I can explain how and why some apps and games may request or take payment for additional content (e.g. in-app purchases, loot boxes) and explain the importance of seeking permission from a trusted adult before purchasing.	
	Week 2	**Flat-file databases** Creating a paper-based database	Database, data, information, record, field, sort, order, group	To use a form to record information • I can create multiple questions about the same field • I can explain how information can be recorded • I can order, sort, and group my data cards	In the first lesson, pupils create a paper version of a record card database. Using a card template, they create a data set, with each pupil creating eight to ten cards linked to a theme, eg animals. They complete records for each of the animals in their database and then physically sort the cards to answer questions about the data.	This unit looks at how a flat-file database can be used to organise data in records. Pupils use tools within a database to order and answer questions about data. They create graphs and charts from their data to help solve problems. They use a real-life database to answer a question, and present their work to others.
	Week 3	**Flat-file databases** Computer databases	Database, data, field, record, sort, order	To compare paper and computer-based databases • I can navigate a flat-file database to compare different views of information • I can explain what a 'field' and a 'record' is in a database • I can choose which field to sort data by to answer a given question	In this lesson, pupils use a computer-based database to examine how data can be recorded and viewed. They learn that a database consists of 'records', and that each record contains 'fields'. In addition, they will order records in different ways and compare this database to the paper database they created in lesson 1.	
	Week 4	**Flat-file databases** Using a database	Database, record, field, group, search, sort, order	To outline how grouping and then sorting data allows us to answer questions • I can explain how information can be grouped • I can group information to answer questions • I can combine grouping and sorting to answer more specific questions	In this lesson, pupils investigate how records can be grouped, using both the paper record cards created in lesson 1 and a computer based database from J2E. They use 'grouping' and 'sorting' to answer questions about the data.	
	Week 5	**Flat-file databases** Using search tools	Database, record, field, value, search, criteria	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	In this lesson, pupils develop their search techniques to answer questions about the data. They use advanced techniques to search for more than one field, and practise doing this through both unplugged methods (without using computers), and using a computer database.	
	Week 6	**Flat-file databases** Comparing data visually	Database, record, field, graph, chart, axis, compare, filter	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	In this lesson, pupils consider what makes a useful chart, and how charts can be used to compare data. They create charts from their data in order to answer questions about it.	

				• I can explain the benefits of using a computer to create graphs		
	Week 7	**Flat-file databases** Databases in real life	Database, field, record, graph, chart, presentation	To apply my knowledge of a database to ask and answer real-world 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	The final lesson requires pupils to use a real-life database to ask questions and find answers in the context of a flight search based on set parameters. They take on the role of a travel agent and present their findings, showing how they arrived at their chosen options. Presentations may be given between groups of pupils, or by each group to the whole class, depending on the time available	
Summer 1	**Week1**	**E-Safety** **Privacy & Security**	Lesson 1 – Developing passwords Lesson 2 – Our data online Lesson 3 – App permissions	• I can explain what a strong password is and demonstrate how to create one. • I can explain how many free apps or services may read and share private information (e.g. friends, contacts, likes, images, videos, voice, messages, geolocation) with others. I can explain what app permissions are and can give some examples.		
	Week 2	**Video editing** What is video?	Video, audio, camera, talking head, panning, close up	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	Learners will be introduced to video as a media format. They will see examples of videos featuring production and editing techniques that they will work towards using their own videos. Learners will begin by explaining what the medium of video is before analysing and comparing examples of videos.	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.
	Week 3	**Video editing** Filing techniques	Video camera, microphone, lens, close up, mid range, long shot, moving subject, side by side, high angle, low angle, normal angle	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	Learners will explore the capabilities of a digital device that can be used to record video. Once they are familiar with their device, learners will experiment with different camera angles, considering how different camera angles can be used for different purposes.	
	Week 4	**Video editing** Using a storyboard	Static camera, zoom, pan, tilt, storyboard	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	Learners will use a storyboard to explore a variety of filming techniques, some of which they will use in their own video project later in the unit. They will evaluate the effectiveness of these techniques before offering feedback on others' work.	To teach this unit, you will need video recording equipment such as video cameras or tablets with video capabilities. The recommended editing software is Microsoft Video Editor, which is included for free with Windows 10.
	Week 5	**Video editing** Planning a video	Storyboard, filming, review	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	Learners will plan a video by creating a storyboard. Their storyboard ill describe each scene, and will include a script, camera angles, and filming techniques. Learners will use their storyboards to film the first scene of their videos.	
	Week 6	**Video editing** Importing and editing video	Import, split, trim, clip, edit, reshoot	To identify that video can be improved through reshooting and editing • I can store, retrieve, and export my	Learners will film the remaining scenes of their video, and then import their content to video editing software. They will then explore key editing techniques and decide whether sections of their video can be edited or need to be shot	

				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	again.	
	Week 7	**Video editing** Video evaluating	Detele, trim, reorder, export, evaluate, share	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	Learners will complete their video by removing unwanted content and reordering their clips. They will then export their finished video and evaluate the effectiveness of their edits. Finally, they will consider how they could share their video with others.	
	Summer 2 **Week 1**	**E- Safety** **Copyright & Ownership**	Lesson 1 – Using online content Lesson 2 – Google SafeSearch Lesson 3 – Copyright rules	• I can assess and justify when it is acceptable to use the work of others. I can give examples of content that is permitted to be reused and know how this content can be found online.		
	Week 2	**Selection in quizzes** Exploring conditions	Selection, condition, true, false, count-controlled loop	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	In this lesson, learners revisit previous learning on 'selection' and identify how 'conditions' are used to control the flow of actions in a program. They are introduced to the blocks for using conditions in programs using the Scratch programming environment. They modify the conditions in an existing program and identify the impact this has.	In this unit, pupils 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 understanding in algorithms, and then by constructing programs using 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
	Week 3	**Selection in quizzes** Selecting outcomes	Selection, condition, true, false, outcomes, conditional statement (the linking together of a condition and outcomes), algorithm, program, debug	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 with different outcomes using selection	In this lesson, learners will develop their understanding of selection by using the 'if… then… else…' structure in algorithms and programs. They will revisit the need to use repetition in selection to ensure that conditions are repeatedly checked. They identify the two outcomes in given programs and how the condition informs which outcome will be selected. Learners use this knowledge to write their own programs that use selection with two outcomes.	
	Week 4	**Selection in quizzes** Asking questions	Selection, condition, true, false, outcomes, question, answer, algorithm, program, debug	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 which contains 'if… then… else…'	In this lesson, learners consider how the 'if… then… else…' structure can be used to identify two responses to a binary question (one with a 'yes or no' answer). They identify that the answer to the question is the 'condition', and use algorithms with a branching structure to represent the actions that will be carried out if the condition is true or false. They learn how questions can be asked in Scratch, and how the answer, supplied by the user, is used in the condition to control the outcomes. They use an algorithm to	

				• I can show that a condition can direct program flow in one of two ways	design a program that uses selection to direct the flow of the program based on the answer provided. They implement their algorithm as a program and test whether both outcomes can be achieved.	further ways it could be improved.
	Week 5	**Selection in quizzes** Planning a quiz	Task, design, algorithm, input, program, selection, condition, outcomes	To design a program which 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	In this lesson, learners will be provided with a task: to use selection to control the outcomes in an interactive quiz. They will outline the requirements of the task and use an algorithm to show how they will use selection in the quiz to control the outcomes based on the answer given. Learners will complete their designs by using storyboards to identify the questions that will be asked, and the outcomes for both correct and incorrect answers. To demonstrate their understanding of how they are using selection to control the flow of the program, learners will identify which outcomes will be selected based on given responses.	There are two Year 5 programming units: • Programming A – Selection in physical computing • Programming B – Selection in quizzes This is unit B, which should be delivered after unit A.
	Week 6	**Selection in quizzes** Testing a quiz	Implement, design, algorithm, program, selection, condition, outcome, test, run	To create a program which 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	In this lesson, learners will use the Scratch programming environment to implement the first section of their algorithm as a program. They will run the first section of their program to test whether they have correctly used selection to control the outcomes, and debug their program if required. They will then continue implementing their algorithm as a program. Once completed, they will consider the value of sharing their program with others so that they can receive feedback. Learners conclude the lesson by using another learner's quiz and providing feedback on it.	
	Week 7	**Selection in quizzes** Evaluating a quiz	Implement, design, algorithm, program, debug, test, setup, selection, condition, outcome, share, evaluate, constructive	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	In this lesson, learners will return to their completed programs and identify ways in which the program can be improved. They will focus on issues where answers similar to those in the condition are given as inputs, and identify ways to avoid such problems. Learners will also consider how the outcomes may change the program for subsequent users, and identify how they can make use of setup to provide all users with the same experience. They will implement their identified improvements by returning to the Scratch programming environment and adding to their programs. They conclude the unit by identifying how they met the requirements of the given task, and identifying the aspects of the program that worked well, those they improved, and areas that could improve further.	

42

Barham Primary School – Computing Year 6

Statutory guidance - National curriculum in England: <u>computing</u> programmes of study   **Updated 30th August 2024**

<u>Purpose of study</u>
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.

<u>Aims</u>
The national curriculum for computing aims to ensure that all pupils:
▪ can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
▪ can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
▪ can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
▪ are responsible, competent, confident and creative users of information and communication technology.

Key stage 2

<u>Pupils should be taught to:</u>

- 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.

Term	Week	Topic/Lesson	Key Vocabulary	Intent	Implementation	Impact
Autumn 1	**Week 1**	**E- Safety Self-image & Identity**	Lesson 1 – Challenging stereotypes Lesson 2 – Managing online situations Lesson 3 – Giving online safety advice	• I can identify and critically evaluate online content relating to gender, race, religion, disability, culture and other groups and explain why it is important to challenge and reject inappropriate representations online. • I can describe issues online that could make anyone feel sad, worried, uncomfortable or frightened. • I know and can give examples of how to get help online and offline. • I can explain the importance of asking until I get the help needed.		

	Week 2	**Internet Communication** Searching the web	Search, search engine, Google, Bing, Yahoo!, Swisscows, DuckDuckGo, refine	To identify how to use a search engine • I can complete a web search to find specific information • I can refine my search • I can compare results from different search engines	In this lesson, learners will be introduced to a range of search engines. They will be given the opportunity to explain how we search, then they will write and test instructions. Next, they will learn that searches do not always return the results that we are looking for, and will refine their searches accordingly. Finally, they will be introduced to the two most common methods of searching: using a search engine and the address bar.	In this unit, the class will learn about the World Wide Web as a communication tool. First, they will learn how we find information on the World Wide Web, through learning how search engines work (including how they select and rank results) and what influences searching, and through comparing different search engines. They will then investigate different methods of communication, before focusing on internet-based communication. Finally, they will evaluate which methods of internet communication to use for particular purposes.
	Week 3	**Internet Communication** Selecting search results	Index, crawler, bot, search engine	To describe how search engines select results • I can explain why we need tools to find things online • I can recognise the role of web crawlers in creating an index I can relate a search term to the search engine's index	In this lesson, learners will gain an understanding of why search engines are necessary to help us find things on the World Wide Web. They will conduct their own searches and break down, in detail, the steps needed to find things on the web. They will then emulate web crawlers to create an index of their own classroom. Finally, they will consider why some searches return more results than others.	
	Week 4	**Internet Communication** How search results are ranked	Ranking, search engine, search engine optimisation, links, web crawlers	To explain how search results are ranked • I can explain that search results are ordered • I can explain that a search engine follows rules to rank relevant pages I can suggest some of the criteria that a search engine checks to decide on the order of results	This lesson includes an unplugged activity in which the class will learn about some of the main factors that influence how a search engine ranks a web page. Learners will create paper-based 'web pages' in groups, on a topic that they are currently studying. They will then discover how their web pages would rank when searching for keywords relating to their content.	
	Week 5	**Internet Communication** How are searches influenced?	Searching, search engine, web crawler, content creator, selection, ranking	To recognise why the order of results is important, and to whom • I can describe some of the ways that search results can be influenced • I can recognise some of the limitations of search engines I can explain how search engines make money	In this lesson, learners will explore how the person performing a web search can influence the results that are returned, and how content creators can optimise their sites for searching. Learners will also explore some of the limitations of searching, then discuss what cannot be searched.	
	Week 6	**Internet Communication** How we communicate	Communication, internet	To recognise how we communicate using technology • I can explain the different ways in which people communicate • I can identify that there are a variety of ways of communicating over the internet I can choose methods of communication to suit particular purposes	In this lesson, learners will deepen their understanding of the term 'communication'. They will explore different methods of communication, then they will consider internet-based communication in more detail. Finally, they will evaluate which methods of communication suit particular purposes.	

	Week 7	**Internet Communication** Searching the web	Search, search engine, Google, Bing, Yahoo!, Swisscows, DuckDuckGo, refine	To identify how to use a search engine • I can complete a web search to find specific information • I can refine my search • I can compare results from different search engines	In this lesson, learners will be introduced to a range of search engines. They will be given the opportunity to explain how we search, then they will write and test instructions. Next, they will learn that searches do not always return the results that we are looking for, and will refine their searches accordingly. Finally, they will be introduced to the two most common methods of searching: using a search engine and the address bar.	
	Autumn 2 **Week 1**	**E-Safety** **Online Relationships**	Lesson 1 – Sharing photos of others Lesson 2 – To share or not to share? Lesson 3 – My digital footprint	• I can explain how sharing something online may have an impact either positively or negatively. • I can describe how to be kind and show respect for others online including the importance of respecting boundaries regarding what is shared about them online and how to support them if others do not. • I can describe how things shared privately online can have unintended consequences for others, for example screen-grabs. • I can explain that taking or sharing inappropriate images of someone, for example embarrassing images, even if they say it is okay, may have an impact for the sharer and others. • I can also explain who can help if someone is worried about this.		
	Week 2	**Web page creation** What makes a good website?	Website, web page, browser, media, Hypertext Markup Language (HTML)	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	In this lesson, learners will explore and review existing websites and evaluate their content. They will have some understanding that websites are created by using HTML code.	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.
	Week 3	**Web page creation** How would you lay out your web page?	Web page, website, logo, layout, header, media, purpose	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	Learners will look at the different layout features available in Google Sites and plan their own web page on paper. **Homework:** Learners will look at two of their favourite websites and sketch them on the worksheet provided, detailing the similarities and differences. **Note:** For the homework activity, teachers could provide printed 'home page' images for anyone who doesn't have internet access at home.	
	Week 4	**Web page creation** Copyright or copyWRONG?	Copyright, fair use	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'	During this lesson learners will become familiar with the terms 'fair use' and 'copyright'. They will gain an understanding of why they should only use copyright-free images and will find appropriate images to use in their work from suggested sources. **Homework:** Learners answer a series of questions based on copyright and fair use.	
	Week 5	**Web page creation** How does it look?	Web page, home page, preview, evaluate, device, Google Sites	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	Today learners will revise how to create their own web page in Google Sites. Using their plan from previous lessons, learners will create their own web page/home page. They will preview their web page as it will appear on different devices and suggest or make edits to improve the user experience on each device.	

				• I can evaluate what my web page looks like on different devices and suggest/make edits.	
	Week 6	**<u>Web page creation</u>** Follow the breadcrumbs	Website, web page, breadcrumb trail, navigation, hyperlink, subpage	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	During this lesson learners will begin to appreciate the need to plan the structure of a website carefully. They will plan their website, paying attention to the navigation paths (the way that pages are linked together). They will then create multiple web pages for their site and use hyperlinks to link them together as detailed in their planning.	
	Week 7	**<u>Web page creation</u>** Think before you link!	Hyperlink, evaluate, website, web page, implication, external link, embed	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	Learners will consider the implications of linking to content owned by other people and create hyperlinks on their own websites that link to other people's work. They will then evaluate the user experience when using their own website and that of another learner.	
Spring 1	Week 1	**<u>E-Safety</u>** **Managing Online Information**	Lesson 1 – Persuasion and adverts Lesson 2 – Fake news detective Lesson 3 – Writing fake news	• I can explain how search engines work and how results are selected and ranked. • I can explain how to use search technologies effectively. • I can describe how some online information can be opinion and can offer examples. • I can explain how and why some people may present opinions as facts, and why the popularity of an opinion or the personalities of those promoting it does not necessarily make it true, fair or perhaps even legal. • I can define the terms 'influence', 'manipulation' and 'persuasion' and explain how someone might encounter these online, for example advertising, ad targeting and targeting for fake news. • I understand the concept of persuasive design and how it can be used to influences peoples' choices. • I can demonstrate how to analyse and evaluate the validity of facts and information, and I can explain why using these strategies is important. • I can explain how companies and news providers target people with online news stories they are more likely to engage with and how to recognise this. • I can describe the difference between online misinformation and disinformation. • I can explain why information that is on a large number of sites may still be inaccurate or untrue. I can assess how this might happen, for example the sharing of misinformation or disinformation. • I can identify, flag and report inappropriate content.		
	Week 2	**<u>Variables in games</u>** Introducing variables	Variable, change, name, value	To define a 'variable' as something that is changeable • I can identify examples of information that is variable • I can explain that the way that a variable changes can be defined • I can identify that variables can hold numbers or letters	In this lesson, pupils will be introduced to variables. Pupils will see examples of real-world variables (score and time in a football match), then they will explore them in a Scratch project. Pupils will then design and make their own project including variables. Finally, pupils will identify that variables are named and can be letters (strings) as well as numbers.	This unit explores the concept of variables in programming through games in Scratch. First, pupils will learn what variables are, and relate them to real-world examples of values that can be set and changed. Pupils will then use variables to create a simulation of a scoreboard. In Lessons 2, 3, and 5, which follow the Use-Modify-Create model, pupils will experiment with variables in an existing project, then modify them, then they will
	Week 3	**<u>Variables in games</u>** Variables in programming	Variable, name, value, set, change	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	In this lesson, pupils will understand that variables are used in programs, and that they can hold a single value at a time. Pupils will complete an unplugged task that will demonstrate the process of changing variables. Next, they will explore why it is important to name variables, then they	

				• I can explain that a variable has a name and a value • I can recognise that the value of a variable can be changed	will apply their learning in a Scratch project in which they will make, name, and update variables.	create their own project. In Lesson 4, pupils will focus on design. Finally, in Lesson 6, pupils will apply their knowledge of variables and design to improve their game in Scratch.
	Week 4	**Variables in games** Improving a game	Variable, set, change, design, event	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	In this lesson, pupils will apply the concept of variables to enhance an existing game in Scratch. They will predict the outcome of changing the same change score block in different parts of a program, then they will test their predictions in Scratch. They will also experiment with using different values in variables, and with using a variable elsewhere in a program. Finally, they will add comments to their project, explaining how they have met the objectives of the lesson.	There are two Year 6 programming units: • Programming A – Variables in games • Programming B – Sensing This is unit A, which should be delivered before unit B.
	Week 5	**Variables in games** Designing a game	Design, algorithm, code	To design a project that builds on a given example • I can choose the artwork for my project • I can explain my design choices • I can create algorithms for my project	This lesson focuses on the design elements of programming. For the majority of the tasks, pupils will be working at the algorithmic level of abstraction. Pupils will first design the sprites and backgrounds for their project, then they will design their algorithms to create their program flow.	
	Week 6	**Variables in games** Design to code	Task, algorithm, design, artwork, program, project, code, test, debug	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	In this lesson, pupils will implement the algorithms that they created in Lesson 4 as code. In doing this, they will identify variables in an unfamiliar project and learn the importance of naming variables. They will also have the opportunity to add another variable to enhance their project.	
	Week 7	**Variables in games** Improving and sharing	Improve, evaluate, share	To evaluate my project • I can identify ways that my game could be improved • I can extend my game further using more variables • I can share my game with others	This lesson gives pupils the opportunity to build on the project that they created in Lesson 5. As the lesson develops, the scaffolding is gradually removed, so that the last main activity is without constraints. Finally, pupils will evaluate each other's projects, identifying features that they like, and features that could be improved further.	
Spring 2 Week 1		**E-Safety** **Health, Wellbeing & Lifestyle**	Lesson 1 – Being healthy with technology Lesson 2 – Persuasive design online Lesson 3 – Pressure and technology	• I can describe common systems that regulate age-related content (e.g. PEGI, BBFC, parental warnings) and describe their purpose. • I recognise and can discuss the pressures that technology can place on someone and how and when they could manage this. • I can recognise features of persuasive design and how they are used to keep users engaged (current and future use). • I can assess and action different strategies to limit the impact of technology on health (e.g. night-shift mode, regular breaks, correct posture, sleep, diet and exercise).		
	Week 2	**Introduction to spreadsheets** What is a spreadsheet?	Spreadsheet, data, data heading, data set, cells, columns and rows.	To identify questions which can be answered using data • I can explain the relevance of data headings • I can answer questions from an existing data set	During this lesson learners will understand that a spreadsheet is a computer application which allows users to organise, analyse, and store data in a table. They will begin to realise the importance of data headings. Learners will answer questions about a spreadsheet, and then create their own questions that can be answered using a given set of data.	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

				I can ask simple relevant questions which can be answered using data		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 graphs and charts, and evaluate their results in comparison to questions asked
	Week 3	**Introduction to spreadsheets** Modifying spreadsheets	Data, data item, data set, object, spreadsheet application, format, common attribute	To explain that objects can be described using data • I can explain what an item of data is • I can apply an appropriate number format to a cell • I can build a data set in a spreadsheet application	During this lesson learners will be taught that objects can be described using data. They will build a data set (a collection of related data that can be manipulated using a computer) within a spreadsheet application, and apply appropriate number formats to cells.	
	Week 4	**Introduction to spreadsheets** What's the formula?	Formula, calculation, data, spreadsheet, input, output. cells, cell reference	To explain that formulas can be used to produce calculated data • I can explain the relevance of a cell's data type • I can construct a formula in a spreadsheet • I can identify that changing inputs changes outputs	During this lesson learners will begin to use formulas to produce calculated data. They will understand that the type of data in a cell is important (e.g. numbers can be used in calculations whereas words cannot). Learners will create formulas to use in their spreadsheet using cell references and identify that changing inputs will change the output of the calculation.	
	Week 5	**Introduction to spreadsheets** Calculate and duplicate	Data, calculate, operation, formula, cell, range, duplicate, sigma	To apply formulas to data, including duplicating • I can recognise that data can be calculated using different operations • I can create a formula which includes a range of cells • I can apply a formula to multiple cells by duplicating i	During this lesson learners will recognise that data can be calculated using different operations: multiplication, subtraction, division, and addition. They will use these operations to create formulas in a spreadsheet. Learners will then begin to understand the importance of creating formulas that include a range of cells and the advantage of duplicating in order to apply formulas to multiple cells.	
	Week 6	**Introduction to spreadsheets** Event planning	Propose, question, data set, data, organised, formula	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	During this lesson learners will plan and calculate the cost of an event using a spreadsheet. They will use a predefined list to choose what they would like to include in their event, and use their spreadsheet to answer questions on the data they have selected. Learners will be reminded of the importance of organising data and will then create a spreadsheet using formulas to work out costs for their event.	
	Week 7	**Introduction to spreadsheets** Presenting data	Graph, chart, evaluate, results, comparison, questions, software, tools, data	To choose suitable ways to present data • I can produce a graph • I can use a graph to show the answer to questions • I can suggest when to use a table or graph	During this lesson learners will acquire the skills to create charts in Google Sheets. They will evaluate results based on questions asked using the chart that they have created. Finally, learners will outline their understanding that there are different software tools available within spreadsheet applications to present data.	

Summer 1	Week 1	**E-Safety** **Privacy & Security**	Lesson 1 – Managing passwords Lesson 2 – Real or fake? Lesson 3 – Phishing	• I can describe effective ways people can manage passwords, for example storing them securely or saving them in the browser. • I can explain what to do if a password is shared, lost or stolen. • I can describe how and why people should keep their software and apps up to date, for example auto updates. • I can describe simple ways to increase privacy on apps and services that provide privacy settings. • I can describe ways in which some online content targets people to gain money or information illegally; • I can describe strategies to help me identify such content (e.g. scams, phishing). • I know that online services have terms and conditions that govern their use.	
	Week 2	**3D modelling** What is 3D modelling?	2D, 3D, 3D object, 3D space, view	To use a computer to create and manipulate three-dimensional (3D) digital objects • I can discuss the similarities and differences between 2D and 3D shapes • I can explain why we might represent 3D objects on a computer • I can select, move, and delete a digital 3D shape	This lesson introduces learners to the concept of 3D modelling by creating a range of 3D shapes that they select and move. They also examine the shapes from a variety of views within the 3D space.	During this unit, 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, including combining 3D objects to make a house and examining the differences between working digitally with 2D and 3D graphics. Learners will progress to making accurate 3D models of physical objects, such as a pencil holder, which include using 3D objects as placeholders. Finally, learners will examine the need to group 3D objects, then go on to plan, develop, and evaluate their own 3D model of a photo frame. For this sequence of lessons, learners will be using a website called Tinkercad (https://www.tinkercad.com). Learners will need accounts to save their work and access the resources. We recommend signing up for a teacher account at https://www.tinkercad.com/join, which enables learner accounts to be created and the website accessed with a Class Code: https://tinkercad.zendesk.com/hc/en-us/articles/360026236693-Tinkercad-Classrooms. Please ensure your school's online safety policy (or similar) is closely adhered to and avoid
	Week 3	**3D modelling** Making changes	2D, 3D, 3D object, 3D space, resize, colour, lift	To compare working digitally with 2D and 3D graphics • I can identify how graphical objects can be modified • I can resize a 3D object • I can change the colour of a 3D object	This lesson examines the similarities and differences between working digitally with 2D and 3D graphics. Learners initially discuss the similarities and differences they have identified so far, then move on to combine 3D shapes, including lifting the 3D object, to produce a house. Learners then colour their 3D shapes, followed by adding further shapes and undertaking further reflection on the similarities and differences between working digitally with 2D and 3D graphics.	
	Week 4	**3D modelling** Rotation and position	Rotate, position, select, duplicate	To construct a digital 3D model of a physical object • I can rotate a 3D object • I can position 3D objects in relation to each other • I can select and duplicate multiple 3D objects	During this lesson, learners will produce a 3D model of a physical object, which will contain a number of different 3D objects. 3D objects will need to be rotated and placed into position in relation to other 3D objects.	
	Week 5	**3D modelling** Making holes	Dimensions, placeholder, hole, group, ungroup	To identify that physical objects can be broken down into a collection of 3D shapes • I can identify the 3D shapes needed to create a model of a real-world object • I can create digital 3D objects of an appropriate size • I can group a digital 3D shape and a placeholder to create a hole in an object	During this lesson, learners will produce a 3D model of a pencil holder desk tidy. The 3D model will contain a number of 3D objects that are of specific dimensions and use other 3D objects as placeholders to create holes with them.	
	Week 6	**3D modelling** Planning my own 3D model	Resize, group, ungroup, design	To design a digital model by combining 3D objects • I can plan my 3D model	During this lesson, learners will resize and enhance their 3D model of a pencil holder desk tidy. Learners will also plan their own 3D model of a photo frame, which will be developed during the next lesson.	

49

			• I can choose which 3D objects I need to construct my model • I can modify multiple 3D objects		using learners' full names when creating accounts.
	Week 7	**3D modelling** Making my own 3D model	Modify, evaluate, improve	To develop and improve a digital 3D model • I can decide how my model can be improved • I can modify my model to improve it • I can evaluate my model against a given criterion	During this lesson, learners will produce their own 3D model based on their planning during the previous lesson. They will evaluate their work and make improvements based on feedback from their peers.	
	Summe r 2 Week1	**E-Safety** **Copyright & Ownership**	Lesson 1 – Copyright presentations Lesson 2 – Referencing Lesson 3 – Bibliographies	• I can demonstrate the use of search tools to find and access online content which can be reused by others. • I can demonstrate how to make references to, and acknowledge, sources I have used from the internet.		
	Week 2	**Sensing** The micro:bit	Micro:bit, MakeCode, input, process, output, flashing, USB	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	In this lesson, learners will be introduced to the micro:bit as an input, process, output device that can be programmed. Learners will familiarise themselves with the device itself and the programming environment, before creating their own programs. They will then flash their programs to the device.	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'.
	Week 3	**Sensing** Go with the flow	Selection, condition, if then else, variable, random	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	In this lesson, learners will explore how if, then, else statements are used to direct the flow of a program. They will initially relate if, then, else statements to real-world situations, before creating programs in MakeCode. They will apply their knowledge of if, then, else statements to create a program that features selection influenced by a random number to create a micro:bit fortune teller project.	It offers learners the opportunity to use all of these constructs in a different, but still familiar environment, while also utilising a physical device — the micro:bit. The unit begins with a simple program for learners to build in and test in the programming environment, before transferring it to their micro:bit. Learners then take on
	Week 4	**Sensing** Sensing inputs	Input, selection, condition, variable, sensing, accelerometer	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 if you read a variable, the value remains	In this lesson, learners will initially use the buttons to change the value of a variable using selection. They will then develop their programs to update the variable by moving their micro:bit using the accelerometer to sense motion. Finally, they will learn that a variable can be displayed after it is updated or in response to an input.	three new projects in Lessons 2, 3, and 4, with each lesson adding more depth. Design features prominently in this unit. A design template is introduced in Lesson 3, initially scaffolded to give learners the opportunity to create code from a given design. In Lesson 4 that
	Week 5	**Sensing** Finding your way	Compass, direction, variable, navigation	To use an conditional statement to compare a variable to a value • I can explain the importance of the order of conditions in else, if statements	In this lesson, learners will initially work at code level by applying their knowledge from the previous lesson to make their micro:bit perform the function of a compass. They will then design a program which will enable the micro:bit to be used as a navigational device. To code this, they will adapt the code they completed to make the compass.	scaffolding is gradually reduced, then in Lesson 5, learners create their own design, using the same template. In the final lesson, learners will apply their

				• I can use an operand (e.g. <>=) in an if, then statement • I can modify a program to achieve a different outcome		knowledge of the programming constructs and use their design to create their own micro:bit-based step counter.
	Week 6	**Sensing** Designing a step counter	Micro:bit, design, task, algorithm, variable, step counter	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	In this lesson, learners will be working at the design level. They will pick out features of a step counter, a piece of technology with which they are likely to be familiar. They will then relate those features to the sensors on a micro:bit. Having seen a simulated example of a micro:bit step counter, learners will pick out features which they will be able to include in their design. In the main activity, learners will design the algorithm for their step counter project. Finally, they will connect the battery pack to their micro:bit to set it up as a portable device.	There are two Year 6 programming units: • Programming A – Variables in games • Programming B – Sensing This is unit B, which should be delivered after unit A.
	Week 7	**Sensing** Making a step counter	Plan, create, code, test, debug	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	In this lesson, learners will use the design that they have created in Lesson 5 to make a micro:bit-based step counter. First they will review their plans, followed by creating their code. Depending on their level of confidence, they can use a scaffolded or part-complete project, otherwise they can start a new project. Learners will test and debug their code, using the emulator and then the physical device. To successfully complete this project, learners will need to use all four programming constructs: sequence, repetition, selection, and variables.	