	COMPUTING SYSTEMS & NETWORKS	CREATING MEDIA	DATA & INFORMATION	PROGRAMMING
EYFS	**30-50 months** •Remember rules without needing an adult to remind them. •Match their developing physical skills to tasks and activities in the setting. •Explore how things work.	**30-50 months** •Remember rules without needing an adult to remind them. •Match their developing physical skills to tasks and activities in the setting. •Explore how things work.	**30-50 months** •Remember rules without needing an adult to remind them. •Match their developing physical skills to tasks and activities in the setting. •Explore how things work.	**30-50 months** •Remember rules without needing an adult to remind them. •Match their developing physical skills to tasks and activities in the setting. •Explore how things work.
	40-60 months •Develop their small motor skills so that they can use a range of tools competently, safely and confidently. •Know and talk about the different factors that support their overall health and wellbeing: - sensible amounts of 'screen time'	**40-60 months** •Explore, use and refine a variety of artistic effects to express their ideas and feelings. **•Develop their small motor skills so that they can use a range of tools competently, safely and confidently.** •Show resilience and perseverance in the face of a challenge.	**40-60 months** •Show resilience and perseverance in the face of a challenge.	**Reception** •Know and talk about the different factors that support their overall health and wellbeing: - sensible amounts of 'screen time' •Show resilience and perseverance in the face of a challenge.
	ELG •Explain the reasons for rules, know right from wrong and try to behave accordingly. •Be confident to try new activities and show independence, resilience and perseverance in the face of challenge.	**ELG** •Explain the reasons for rules, know right from wrong and try to behave accordingly. •Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. •Be confident to try new activities and show independence, resilience and perseverance in the face of challenge.	**ELG** •Explain the reasons for rules, know right from wrong and try to behave accordingly. •Be confident to try new activities and show independence, resilience and perseverance in the face of challenge.	**ELG** •Explain the reasons for rules, know right from wrong and try to behave accordingly. •Be confident to try new activities and show independence, resilience and perseverance in the face of challenge.
YEAR 1	**Technology around us** *Recognising technology in school and using it responsibly* To identify technology To identify a computer and its main parts To use a mouse in different ways To use a keyboard to type To use the keyboard to edit text To create rules for using technology responsibly **Progression** As this is a Year 1 unit, no prior knowledge is assumed. This unit progresses students' knowledge and understanding of technology and how they interact with it in school. Learners will build their knowledge of parts of a computer and develop the basic skills needed to effectively use a computer keyboard and mouse. This unit directly precedes the Y2 Computer systems and networks unit, IT around us	**A:Digital painting** *Choosing appropriate tools in a program to create art, and making comparisons with working non-digitally.* To describe what different freehand tools do To use the shape tool and the line tools To make careful choices when painting a digital picture To explain why I chose the tools I used To use a computer on my own to paint a picture To compare painting a picture on a computer and on paper **Progression** Learners should be familiar with: •How to switch their device on •Usernames •Passwords For an introduction to keyboard and mouse skills, learners may benefit from completing the Year 1 Computing Systems & Networks unit prior to this unit. **B: Digital writing** *Using a computer to create and format text, before comparing to writing non-digitally.* To use a computer to write To add and remove text on a computer To identify that the look of text can be changed on a computer To make careful choices when changing text To explain why I used the tools that I chose To compare writing on a computer with writing on paper **Progression** This unit progresses the learners' knowledge and understanding of using computers to create and manipulate digital content, focusing on using a word processor. The learners will develop their ability to find and use the keys on a keyboard in order to create digital content. The learners are then introduced to manipulating the resulting text, making cosmetic changes, and justifying their reason for making these changes. Following this unit, learners will further develop their digital writing skills in the Year 3 – 'Desktop publishing' unit and the Year 6 – 'Web page development' unit.	**Grouping data** *Exploring object labels, then using them to sort and group objects by properties.* To label objects To identify that objects can be counted To describe objects in different ways To count objects with the same properties To compare groups of objects To answer questions about groups of objects **Progression** This unit will introduce learners to data and information. It will introduce learners to the concept of labelling and grouping objects based on their properties. Learners will develop their understanding that objects can be given labels, which is fundamental to their future learning concerning databases and spreadsheets. In addition, learners will begin to improve their ability to use dragging and dropping skills on a device. Following this unit, in year 2, learners will present data graphically in pictograms.	**A: Moving a robot** *Writing short algorithms and programs for floor robots, and predicting program outcomes.* To explain what a given command will do To act out a given word To combine forwards and backwards commands to make a sequence To combine four direction commands to make sequences To plan a simple program To find more than one solution to a problem **Progression** As this is a Year 1 unit, no prior knowledge is assumed. This unit progresses students' knowledge and understanding of giving and following instructions. It moves from giving instructions to each other to giving instructions to a robot by programming it. **B: Introduction to animation** *Designing and programming the movement of a character on screen to tell stories.* To choose a command for a given purpose To show that a series of commands can be joined together To identify the effect of changing a value To explain that each sprite has its own instructions To design the parts of a project To use my algorithm to create a program **Progression** This unit progresses learners' knowledge and understanding of programming and follows on from 'Programming A – Moving a robot', where children will have learned to program a floor robot using instructions.
YEAR 2	**Information technology around us** *Identifying IT and how its responsible use improves our world in school and beyond.* To recognise the uses and features of information technology To identify information technology in the home To identify information technology beyond school To explain how information technology benefits us To show how to use information technology safely To recognise that choices are made when using information technology **Progression** This unit progresses learners' understanding of technology and how they interact with it. They will develop this understanding to become familiar with the term information technology and will be able to identify common features of IT. This unit also builds on the learners' understanding of using technology safely and responsibly.	**A: Digital photography** *Capturing and changing digital photographs for different purposes.* To know what devices can be used to take photographs To use a digital device to take a photograph To describe what makes a good photograph To decide how photographs can be improved To use tools to change an image To recognise that images can be changed **Progression** This unit begins the learners' understanding of how photos are captured and can be manipulated for different purposes. Following this unit, learners will develop their photo editing skills in Year 4. **B: Making music** *Using a computer as a tool to explore rhythms and melodies, before creating a musical composition.* To say how music can make us feel To identify that there are patterns in music To describe how music can be used in different ways To show how music is made from a series of notes To create music for a purpose To review and refine our computer work **Progression** Learners should have experience of making choices on a tablet/computer, and they should be able to navigate within an application. Learners should also have some experience of patterns. This unit progresses students' knowledge through listening to music and considering how music can affect how we think and feel. Learners will then purposefully create rhythm patterns and music.	**Pictograms** *Collecting data in tally charts and using attributes to organize and present data on a computer.* To recognise that we can count and compare objects using tally charts To recognise that objects can be represented as pictures To create a pictogram To select objects by attribute and make comparisons To recognise that people can be described by attributes To explain that we can present information using a computer **Progression** This unit progresses students' knowledge and understanding of grouping data. It builds on the Year 1 Data and Information unit where learners labelled objects and grouped them based on different properties. In Year 3 learners develop their understanding of attributes (properties) using branching databases to structure data according to different object attributes.	**A: Robot algorithms** *Creating and debugging programs, and using logical reasoning to make predictions.* To describe a series of instructions as a sequence To explain what happens when we change the order of instructions To use logical reasoning to predict the outcome of a program (series of commands) To explain that programming projects can have code and artwork To design an algorithm To create and debug a program that I have written **Progression** In advance of the lessons in this Year 2 unit, learners should have had some experience of creating short programs using floor robots and predicting the outcome of a simple program. This unit progresses learners' knowledge and understanding of algorithms and how they are implemented as programs on digital devices. Learners will spend time looking at how the order of commands affects outcomes. Learners will use this knowledge and logical reasoning to trace programs and predict outcomes. **B: Introduction to quizzes** *Designing algorithms and programs that use events to trigger sequences of code to make an interactive quiz.* To explain that a sequence of commands has a start To explain that a sequence of commands has an outcome To create a program using a given design To change a given design To create a program using my own design To decide how my project can be improved **Progression** This unit progresses learners' knowledge and understanding of instructions in sequences and the use of logical reasoning to predict outcomes.
YEAR 3	**Connecting computers** *Identifying that digital devices have inputs, processes, and outputs, and how devices can be connected to make networks.* To explain how digital devices function To identify input and output devices To recognise how digital devices can change the way we work To explain how a computer network can be used to share information To explore how digital devices can be connected To recognise the physical components of a network **Progression** This unit progresses learners' knowledge and understanding of technology by focusing on digital and non-digital devices, and introducing the concept of computers connected together as a network. Following this unit, learners will explore the internet as a network of networks.	**A: Stop-frame animation** *Capturing and editing digital still images to produce a stop-frame animation that tells a story.* To explain that animation is a sequence of drawings or photographs To relate animated movement with a sequence of images To plan an animation To identify the need to work consistently and carefully To review and improve an animation To evaluate the impact of adding other media to an animation **Progression** This unit progresses students' knowledge and understanding of using digital devices to create media, exploring how they can create stop-frame animations. Following this unit, learners will further develop their video editing skills in Year 5. **B: Desktop publishing** *Creating documents by modifying text, images, and page layouts for a specified purpose.* To recognise how text and images convey information To recognise that text and layout can be edited To choose appropriate page settings To add content to a desktop publishing publication To consider how different layouts can suit different purposes To consider the benefits of desktop publishing **Progression** This unit progresses learners' knowledge and understanding of using digital devices to combine text and images building on work from the following units; Digital Writing Year 1, Digital painting Year 1, and Digital Photography Year 2.	**Branching databases** *Building and using branching databases to group objects using yes/no questions.* To create questions with yes/no answers To identify the object attributes needed to collect relevant data To create a branching database To identify objects using a branching database To explain why it is helpful for a database to be well structured To compare the information shown in a pictogram with a branching database **Progression** This unit progresses students' knowledge and understanding of presenting information. It builds on their knowledge of data and information from key stage 1. They continue to develop their understanding of attributes and begin to construct and interrogate branching databases as a means of displaying and retrieving information.	**A: Sequence in music** *Creating sequences in a block-based programming language to make music.* To explore a new programming environment I can identify that each sprite is controlled by the commands I choose To explain that a program has a start To recognise that a sequence of commands can have an order To change the appearance of my project To create a project from a task description **Progression** This unit assumes that learners will have some prior experience of programming; the KS1 NCCE units cover floor robots and ScratchJr. However, experience of other languages or environments may also be useful. **B: Events and actions** *Writing algorithms and programs that use a range of events to trigger sequences of actions.* To explain how a sprite moves in an existing project To create a program to move a sprite in four directions To adapt a program to a new context To develop my program by adding features To identify and fix bugs in a program To design and create a maze-based challenge **Progression** This unit assumes that learners will have some prior experience of programming. The key stage 1 National Centre for Computing Education units focus on floor robots and ScratchJr, however experience of other languages or environments may also be useful. The Year 3 — Programming A unit introduces the Scratch programming environment and the concept of sequences.

YEAR 4	**The internet** *Recognising the internet as a network of networks including the WWW, and why we should evaluate online content.* To describe how networks physically connect to other networks To recognise how networked devices make up the internet To outline how websites can be shared via the World Wide Web To describe how content can be added and accessed on the World Wide Web To recognise how the content of the WWW is created by people To evaluate the consequences of unreliable content **Progression** This unit progresses students' knowledge and understanding of networks in Year 3. In Year 5, they will continue to develop their knowledge and understanding of computing systems and online collaborative working.	**A: Audio editing** *Capturing and editing audio to produce a podcast, ensuring that copyright is considered.* To identify that sound can be digitally recorded To use a digital device to record sound To explain that a digital recording is stored as a file To explain that audio can be changed through editing To show that different types of audio can be combined and played together To evaluate editing choices made **Progression** This unit progresses students' knowledge and understanding of creating media, by focusing on the recording and editing of sound to produce a podcast. Following this unit, learners will explore combining audio with video in the 'Video editing' unit in Year 5. **B: Photo editing** *Manipulating digital images, and reflecting on the impact of changes and whether the required purpose is fulfilled.* To explain that digital images can be changed To change the composition of an image To describe how images can be changed for different uses To make good choices when selecting different tools To recognise that not all images are real To evaluate how changes can improve an image **Progression** Learners should have experience of making choices on a tablet/computer. They should be able to navigate within an application. This unit progresses students' skills through editing digital images and considering the impact that editing can have on an image. Learners will also consider how editing can be used appropriately for different scenarios, and create and evaluate 'fake' images, combining all of their new skills.	**Data logging** *Recognising how and why data is collected over time, before using data loggers to carry out an investigation.* To explain that data gathered over time can be used to answer questions To use a digital device to collect data automatically To explain that a data logger collects 'data points' from sensors over time To use data collected over a long duration to find information To identify the data needed to answer questions To use collected data to answer questions **Progression** This unit progresses learners' knowledge and understanding of data and how it can be collected over time to answer questions. Specifically, it builds on the concept of answering questions with data which is first introduced in the KS1 data and information units. The unit also introduces the idea of automatic data collection. Learners are also introduced to data in tables and graphs, knowledge they will build on in the Year 5 unit (flat file databases) and the Year 6 unit (spreadsheets).	**A: Repetition in shapes** *Using a text-based programming language to explore count-controlled loops when drawing shapes.* To identify that accuracy in programming is important To create a program in a text-based language To explain what 'repeat' means To modify a count-controlled loop to produce a given outcome To decompose a program into parts To create a program that uses count-controlled loops to produce a given outcome **Progression** This unit progresses students' knowledge and understanding of programming. It progresses from the sequence of commands in a program to using count-controlled loops. Pupils will create algorithms and then implement those algorithms as code. **B: Repetition in games** *Using a block-based programming language to explore count-controlled and infinite loops when creating a game.* To develop the use of count-controlled loops in a different programming environment To explain that in programming there are infinite loops and count controlled loops To develop a design which includes two or more loops which run at the same time To modify an infinite loop in a given program To design a project that includes repetition To create a project that includes repetition **Progression** This unit assumes that learners will have some prior experience of programming. The KS1 NCCE units cover floor robots and ScratchJr, and Scratch is introduced in the Year 3 programming units. However, experience of other languages or environments may also be useful.
YEAR 5	**Sharing information** *Identifying and exploring how information is shared between digital systems.* To explain that computers can be connected together to form systems To recognise the role of computer systems in our lives To recognise how information is transferred over the internet To explain how sharing information online lets people in different places work together To contribute to a shared project online To evaluate different ways of working together online **Progression** This unit progresses learners' knowledge and understanding of computing systems and online collaborative working.	**A: Video editing** *Planning, capturing, and editing video to produce a short film.* To recognise video as moving pictures, which can include audio To identify digital devices that can record videoTo capture video using a digital device To recognise the features of an effective video To identify that video can be improved through reshooting and editing To consider the impact of the choices made when making and sharing a video **Progression** This unit progresses learners' knowledge and understanding of creating media by guiding them systematically through the process involved in creating a video. The unit builds on the Year 4 unit 'Photo editing' where composition is introduced and the Year 3 unit 'Stop-frame animation' where learners explored some of the features of video production. By the end of this unit, learners will have developed the skills required to plan, record, edit, and share a video. **B: Vector drawing** *Creating images in a drawing program by using layers and groups of objects.* To identify that drawing tools can be used to produce different outcomes To create a vector drawing by combining shapes To use tools to achieve a desired effect To recognise that vector drawings consist of layers To group objects to make them easier to work with To evaluate my vector drawing **Progression** This unit progresses learners' knowledge and understanding of digital painting and has some links to the Year 3 'Creating media – Desktop publishing' unit, in which learners used digital images. In this Year 5 unit, learners create images that could be used in desktop publishing documents.	**Flat-file databases** *Using a database to order data and create charts to answer questions.* To use a form to record information To compare paper and computer-based databases To outline how grouping and then sorting data allows us to answer questions To explain that tools can be used to select specific data To explain that computer programs can be used to compare data visually To apply my knowledge of a database to ask and answer real-world questions **Progression** This unit progresses learners' knowledge and understanding of why and how information might be stored in a database, and looks at how tools within a database can help us to answer questions about our data. It moves on to demonstrate how a database can help us display data visually, and how real-life databases can be used to help us solve problems. Finally, the learners create a presentation showing understanding and application of all the tools used within the unit.	**A: Selection in physical computing** *Exploring conditions and selection using a programmable microcontroller.* To control a simple circuit connected to a computer To write a program that includes count-controlled loops To explain that a loop can stop when a condition is met, eg number of times To conclude that a loop can be used to repeatedly check whether a condition has been met To design a physical project that includes selection To create a controllable system that includes selection **Progression** This unit assumes that learners will have prior experience of programming using a block-based language (eg Scratch) and understand the concepts of sequence and repetition. The National Centre for Computing Education key stage 1 units focus on floor robots and ScratchJr, however, experience of other languages or environments may also be useful. **B: Selection in games** *Exploring selection in programming to design and code an interactive quiz.* To explain how selection is used in computer programs To relate that a conditional statement connects a condition to an outcome To explain how selection directs the flow of a program To design a program which uses selection To create a program which uses selection To evaluate my program **Progression** This unit assumes that learners will have prior experience of programming using a block-based language (eg Scratch) and understand the concepts of sequence and repetition. The National Centre for Computing Education key stage 1 units focus on floor robots and ScratchJr, however, experience of other languages or environments may also be useful.
YEAR 6	**Internet Communication** *Recognising how the WWW can be used to communicate and be searched to find information.* To identify how to use a search engine To describe how search engines select results To describe how search engines select results To explain how search results are ranked To recognise why the order of results is important, and to whom To recognise how we communicate using technology To evaluate different methods of online communication **Progression** This unit progresses learners' knowledge and understanding of computing systems and online collaborative working.	**A: Web page creation** *Designing and creating webpages, giving consideration to copyright, aesthetics, and navigation.* To review an existing website and consider its structure To plan the features of a web page To consider the ownership and use of images (copyright) To recognise the need to preview pages To outline the need for a navigation path To recognise the implications of linking to content owned by other people **Progression** This unit progresses students' knowledge and understanding of the following: digital writing, digital painting, desktop publishing, digital photography, photo editing, and vector drawing. **B: 3D modelling** *Planning, developing, and evaluating 3D computer models of physical objects.* To use a computer to create and manipulate three-dimensional (3D) digital objects To compare working digitally with 2D and 3D graphics To construct a digital 3D model of a physical object To identify that physical objects can be broken down into a collection of 3D shapes To design a digital model by combining 3D objects To develop and improve a digital 3D model **Progression** This unit progresses students' knowledge and understanding of creating 3D graphics using a computer. Prior to undertaking this unit, learners should have worked with 2D graphics applications.	**Spreadsheets** *Answering questions by using spreadsheets to organise and calculate data.* To identify questions which can be answered using data To explain that objects can be described using data To explain that formula can be used to produce calculated data To apply formulas to data, including duplicating To create a spreadsheet to plan an event To choose suitable ways to present data **Progression** This unit progresses students' knowledge and understanding of data, and teaches them how to organise and modify data within spreadsheets. Specifically, learners will have experienced data in tables and charts in the Y4 data logging and Y5 branching database units.	**A: Variables in games** *Exploring variables when designing and coding a game.* To define a 'variable' as something that is changeable To explain why a variable is used in a program To choose how to improve a game by using variables To design a project that builds on a given example To use my design to create a project To evaluate my project **Progression** This unit assumes that learners have some prior experience of programming in Scratch. Specifically, they should be familiar with the programming constructs of sequence, repetition, and selection. These constructs are covered in the Year 3, 4, and 5 National Centre for Computing Education programming units respectively. Each year group includes at least one unit that focuses on Scratch. **B: Sensing** *Designing and coding a project that captures inputs from a physical device.* To create a program to run on a controllable device To explain that selection can control the flow of a program To update a variable with a user input To use an conditional statement to compare a variable to a value To design a project that uses inputs and outputs on a controllable device To develop a program to use inputs and outputs on a controllable device **Progression** This unit presumes that pupils are already confident in their understanding of sequence, repetition and selection independently within programming. If pupils are not yet ready for this, you may wish to revisit earlier programming units where these constructs are introduced.