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Computing Year A (YEARS 1, 3 and 5)

Year A : Year 1 and 2 - Technology All Around Us **Autumn 1** **DIGITAL LITERACY**	
Key Learning Learners 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 how to use technology responsibly.	**Vocabulary** technology, computer, mouse, trackpad, keyboard, screen, click, drag, input device, shift, spacebar, capital letter, full stop, safely, responsibly
Required Prior Knowledge 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.	
Endpoint **Lesson 1: To identify technology** I can explain technology as something that helps us technology examples help us I can locate examples of technology in the classroom I can explain how these	

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Lesson 2: To identify a computer and its main parts
I can name the main parts of a computer I can switch on and log into a computer I can use a mouse to click and drag

Lesson 3: To use a mouse in different ways
I can use a mouse to open a program I can click and drag to make objects on a screen I can use a mouse to create a picture

Lesson 4: To use a keyboard to type on a computer
I can say what a keyboard is for I can type my name on a computer I can save my work to a file

Lesson 5: To use the keyboard to edit text
I can open my work from a file I can use the arrow keys to move the cursor I can delete letters

Lesson 6: To create rules for using technology responsibly
I can identify rules to keep us safe and healthy when we are using technology in and beyond the home
I can give examples of some of these rules I can discuss how we benefit from these rules

Year A : Year 1 and 2 - Digital Painting
Autumn 2
INFORMATION TECHNOLOGY

Key Learning	**Vocabulary**
Learners will develop their understanding of a range of tools used for digital painting. They then use these tools to create their own digital paintings, while gaining inspiration from a range of artists' work. The unit concludes with learners considering their preferences when painting with and without the use of digital devices.	paint program, tool, paintbrush, erase, fill, undo, Piet Mondrian, primary colours, shape tools, line tool, fill tool, undo tool, Henri Matisse, Wassily Kandinsky, feelings, colour, brush style, George Seurat, Pointillism, prefer, dislike, like

Required Prior Knowledge

This unit progresses the learners' knowledge and understanding of using computers to create and manipulate digital content, focussing 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 [illegible] 6 – 'Web page development' unit.

Endpoint

Lesson 1: 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

Lesson 2: To use the shape tool and the line tool
I can make marks with the square and line tools I can use the shape and line tools effectively
I can use the shape and line tools to recreate the work of an artist

Lesson 3: 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

Lesson 4: To explain why I chose the tools I use
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

Lesson 5: 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

Lesson 6: To compare painting a picture on a computer and on paper
I can explain that pictures can be made in lots of different way 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

Year A: Year 1 and 2 -Digital Writing
Spring 1
INFORMATION TECHNOLOGY

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Key Learning	**Vocabulary**
Learners will develop their understanding of the various aspects of using a computer to create and manipulate text. They will become more familiar with using a keyboard and mouse to enter and remove text. Learners will also consider how to change the look of their text, and will be able to justify their reasoning in making these changes. Finally, learners will consider the differences between using a computer to create text, and writing text on paper. They will be able to explain which method they prefer and explain their reasoning for choosing this.	word processor, keyboard, keys, letters, Microsoft Word, letters, numbers, space, backspace, text cursor, toolbar, bold, italic, underline, undo, font, toolbar

Required Prior Knowledge

This unit progresses the learners' knowledge and understanding of using computers to create and manipulate digital content, focussing 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.

Endpoint

Lesson 1: 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

Lesson 2: To add and remove text on a computer
I can enter text into a computer I can use backspace to remove text I can use letter, number, and Space keys

Lesson 3: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

Lesson 4: 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

Lesson 5: 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

Lesson 6: 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

Year A: Year 1 and Year 2- Grouping Data
Spring 2
DATA HANDLING

Key Learning

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 different labels in order to demonstrate how computers are able to group and present data.

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.

Vocabulary

object, label, group, search, image, colour, shape, property, value, data set, less, most, fewest, the same

Required Prior Knowledge

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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.

Endpoint

Lesson 1: 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

Lesson 2: To identify that objects can be counted
I can count objects I can group object I can count a group of objects

Lesson 3: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

Lesson 4: To count objects with the same properties
I can group similar object I can group objects in more than one way I can count how many objects share a property

Lesson 5: 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

Lesson 6: 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

Year A: Year 1 and Year 2- Moving a Robot
Summer 1
COMPUTER SCIENCE-PROGRAMMING

Key Learning	**Vocabulary**

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Learners will be introduced 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 command for the floor robot 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.	forwards, backwards, turn, clear, go, commands, instructions, directions, left, right, plan, algorithm, route, program

Required Prior Knowledge

As this is a Year 1 unit, no prior knowledge is assumed.This unit progresses learners' 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.

Endpoint

Lesson 1: 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

Lesson 2: To act out a given word
I can follow an instruction I can recall words that can be acted out I can give directions

Lesson 3: To combine 'forwards' and 'backwards' commands to make a sequence
I can compare forward and backward movements I can start a sequence from the same place
I can predict the outcome of a sequence involving 'forwards' and 'backwards' commands

Lesson 4: 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

Lesson 5:To plan a simple program
I can explain what my program should do I can choose the order of commands in a sequence

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I can debug my program

Lesson 6: 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

Year A: Year 1 and Year 2- Introduction to animation
Summer 2
COMPUTER SCIENCE-PROGRAMMING

Key Learning

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.

Vocabulary

ScratchJr, Bee-Bot, command, sprite, compare, programming, programming area, block, joining, start, program, background, delete, reset, algorithm, predict, effect, change, value, block, instructions, appropriate, design

Required Prior Knowledge

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.

Endpoint

Lesson 1: 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

Lesson 2: 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

Lesson 3: 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

Lesson 4: 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

Lesson 5: 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

Lesson 6: To use my algorithm to create a program
I can use sprites that match my design I can add programming blocks based on my algorithm
I can test the programs I have created

Year A: Year 3 and Year 4- Connecting computers
Autumn 1
DIGITAL LITERACY

Key Learning

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.

Vocabulary

digital device, input, output, process, program, connection, network, network switch, server, wireless access point (WAP)

Required Prior Knowledge

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.

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Endpoint

Lesson 1: 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

Lesson 2: 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

Lesson 3: 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

Lesson 4: 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

Lesson 5: 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

Lesson 6: To recognise the physical components of a network

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

Year A: Year 3 and Year 4- Animation
Autumn 2
INFORMATION TECHNOLOGY

Key Learning	Vocabulary

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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.	animation, flip book, stop frame, animation, frame, sequence, image, photograph, setting, character, events, onion skinning, consistency, delete, frame, media, import, transition

Required Prior Knowledge

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.

Endpoint

Lesson 1: 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

Lesson 2: 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

Lesson 3: 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

Lesson 4: 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

Lesson 5: 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

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Lesson 6: 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

Year A: Year 3 and Year 4- Desktop publishing
Spring 1
INFORMATION TECHNOLOGY

Key Learning

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.

Vocabulary

Text, images, advantages, disadvantages, communicate, font, style, template, desktop publishing, copy, paste, layout, purpose, benefits

Required Prior Knowledge

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.

Endpoint

Lesson 1: 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

Lesson 2: 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

Lesson 3: 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

Lesson 4: 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

Lesson 5: 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

Lesson 6: 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

Year A: Year 3 and Year 4 -Branching Databases
Spring 2
DATA HANDLING

Key Learning	**Vocabulary**
Learners will develop their understanding of what a branching database is and how to create one. They will use yes/no questions to gain an understanding of what attributes are and how to use them to sort groups of objects. Learners will create physical and on-screen branching databases. To conclude the unit, they will create an identification tool using a branching database, which they will test by using it. They will also consider real-world applications for branching databases.	attribute, value, questions, table, objects, branching databases, objects, equal, even, separate, order, organise, j2data, selecting, pictogram, information, decision tree, questions

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Required Prior Knowledge

This unit progresses learners' knowledge and understanding of the categories of data handling, with a particular focus on implementation. It builds on their knowledge of data and information from key stage 1. They will continue to develop their understanding of attributes and begin to construct and interrogate branching databases as a means of displaying and retrieving information.

Endpoint

Lesson 1: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

Lesson 2:To identify the attributes needed to collect data about an object
I can select an attribute to separate objects into groups I can create a group of objects within an existing group
I can arrange objects into a tree structure

Lesson 3: To create a branching database
I can select objects to arrange in a branching database I can group objects using my own yes/no questions
I can test my branching database to see if it works

Lesson 4: To explain why it is helpful for a database to be well structured
I can create yes/no questions using given attributes I can compare two branching database structures
I can explain that questions need to be ordered carefully to split objects into similarly sized groups

Lesson 5: To plan the structure of a branching database
I can independently create questions to use in a branching database I can create questions that will enable objects to be uniquely identified
I can create a physical version of a branching database

Lesson 6: To independently create an identification tool
I can create a branching database that reflects my plan I can work with a partner to test my identification tool
I can suggest real-world uses for branching databases

Year A: Year 3 and Year 4 - Sequences in music
Summer 1

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COMPUTER SCIENCE-PROGRAMMING

Key Learning

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.

Vocabulary

Scratch, programming, blocks, commands, code, sprite, costume, stage, backdrop, motion, turn, point in direction, go to, glide, event, task, design, code, run the code, order, note, chord, algorithm, bug, debug

Required Prior Knowledge

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.

Endpoint

Lesson 1: 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

Lesson 2: 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

Lesson 3: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

Lesson 4: 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

Lesson 5: 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

Lesson 6: 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

Year A: Year 3 and Year 4 - Events and actions
Summer 2
COMPUTER SCIENCE-PROGRAMMING

Key Learning

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.

Vocabulary

motion, event, sprite, algorithm, logic, move, resize, algorithm, extension block, pen up, set up, design, action, debugging, errors, setup, test

Required Prior Knowledge

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.

Endpoint

Lesson 1: 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

Lesson 2: 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

Lesson 3: 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

Lesson 4: 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

Lesson 5: 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

Lesson 6: To design and create a maze-based challenge
I can make design choices and justify them I can implement my design
I can evaluate my project

Year A: Year 5 and Year 6- Sharing Information
Autumn 1
DIGITAL LITERACY

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Key Learning	**Vocabulary**
Learners develop their understanding of computer systems and how information is transferred between systems and devices. Learners consider small-scale systems as well as large-scale systems. They explain the input, output, and process aspects of a variety of different real-world systems. Learners discover how information is found on the World Wide Web, through learning how search engines work (including how they select and rank results) and what influences searching, and through comparing different search engines.	System, connection, digital, input, process, output, protocol,address, packet, chat, explore, slide deck, reuse, remix, collaboration

Required Prior Knowledge

This unit progresses learners' knowledge and understanding of computing systems.

Endpoint

Lesson 1: 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 the input, process, and output of a digital system
I can explain that computer systems communicate with other devices

Lesson 2: 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

Lesson 3: To identify how to use a search engine
I can make use of a web search to find specific information I can refine my web search
I can compare results from different search engines

Lesson 4: 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

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Lesson 5: To explain how search results are ranked
I can order a list by rank I can explain that a search engine follows rules to rank results
I can give examples of criteria used by search engines to rank results

Lesson 6: 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

Year A: Year 5 and Year 6 - Vector Drawing
Autumn 2
INFORMATION TECHNOLOGY

Key Learning

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.

Vocabulary

vector, drawing tools, shapes, object, icons, toolbar, move, resize, colour, rotate, duplicate/copy, zoom, select, alignment grid, handles, consistency, modify, layers, front, back, copy, paste, group, ungroup, reuse, improvement, evaluate, alternatives

Require Prior Knowledge

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.

Endpoint

Lesson 1: 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

Lesson 2 : 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

Lesson 3: 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

Lesson 4: To recognise that vector drawings consist of layers
I can identify that each added object creates a new layer in the drawing I can change the order of layers in a vector drawing
I can use layering to create an image

Lesson 5: 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 object
I can reuse a group of objects to further develop my vector drawing

Lesson 6: 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

Year A: Year 5 and Year 6 - Video editing
Spring 1
INFORMATION TECHNOLOGY

Key Learning	**Vocabulary**
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	video, audio, recording, storyboard, script, soundtrack, dialogue, capture, zoom, storage, digital, tape, AV (audiovisual), videographer, video techniques, zoom, pan, tilt, angle, YouTuber, content, camera, colour, export, trim/clip, titles, end credits, timeline, transitions, soundtrack,

progress in creating a video.	retake/reshoot, special effects, constructive feedback

Required Prior Knowledge

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.

Endpoint

Lesson 1: 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

Lesson 2: 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

Lesson 3: 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

Lesson 4: 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

Lesson 5: To identify that video can be improved through reshooting and editing
I can store, retrieve, and export my recording to a computer I can explain how to improve a video by reshooting and editing
I can select the correct tools to make edits to my video

Lesson 6: 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

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Year A: Year 5 and Year 6 - Flat-file databases
Spring 2
DATA HANDLING

Key Learning	**Vocabulary**
This unit looks at how a flat-file database can be used to organise data in records. Learners will use tools within a database to order and answer questions about data. They will create graphs and charts from their data to help solve problems. They will also use a real-life database to answer a question, and present their work to others.	database, data, information, record, field, sort, order, group, search, criteria, value, graph, chart, axis, compare, filter, presentation

Required Prior Knowledge

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.

Endpoint

Lesson 1: To use a form to record information
I can create a database using cards I can explain how information can be recorded I can order, sort, and group my data cards

Lesson 2: To compare paper and computer-based databases
I can explain what a field and a record is in a database I can navigate a flat-file database to compare different views of information
I can choose which field to sort data by to answer a given question

Lesson 3: To outline how you can answer questions by grouping and then sorting data
I can explain that data can be grouped using chosen values I can group information using a database
I can combine grouping and sorting to answer specific questions

Lesson 4: 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

Lesson 5: To explain that computer programs can be used to compare data visually
I can select an appropriate chart to visually compare data I can refine a chart by selecting a particular filter
I can explain the benefits of using a computer to create charts

Lesson 6: To use a real-world database to answer questions
I can ask questions that will need more than one field to answer I can refine a search in a real-world context
I can present my findings to a group

Year A: Year 5 and Year 6 - Selection in physical computing
Summer 1
COMPUTER SCIENCE-PROGRAMMING

Key Learning	**Vocabulary**
In this unit, learners will use physical computing to explore the concept of selection in programming through the use of the Crumble programming environment. Learners will be introduced to a microcontroller (Crumble controller) and learn how to connect and program it to control components (including output devices — LEDs and motors). Learners will be introduced to conditions as a means of controlling the flow of actions in a program. Learners will make use of their knowledge of 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	microcontroller, crumble controller, components, LED, Sparkle, crocodile clips, connect, battery box, program, repetition, infinite loop, count-controlled loop, condition, true, false, input, action, selection, motor, switch, algorithm, debug, evaluate

can be used to control the operation of the model. Throughout this unit, learners will apply the stages of programming design.	

Required Prior Knowledge

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.

Endpoint

Lesson 1: 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

Lesson 2: 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

Lesson 3: 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

Lesson 4: 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

Lesson 5: 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

Lesson 6: To create a program that controls a physical computing project

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I can write an algorithm that describes what my model will do
I can test and debug my project

I can use selection to produce an intended outcome

Year A: Year 5 and Year 6 - Selection in quizzes
Summer 2
COMPUTER SCIENCE-PROGRAMMING

Key Learning

Learners will develop their knowledge of 'selection' by revisiting how 'conditions' can be used in programming, and then learning how the 'if… then… else...' structure can be used to select different outcomes depending on whether a condition is 'true' or 'false'. They represent this understanding in algorithms, and then by constructing programs in the Scratch programming environment. They learn how to write programs that ask questions and use selection to control the outcomes based on the answers given. They use this knowledge to design a quiz in response to a given task and implement it as a program. To conclude the unit, learners evaluate their program by identifying how it meets the requirements of the task, the ways they have improved it, and further ways it could be improved.

Vocabulary

selection, condition, true, false, count-controlled loop, outcomes, conditional statement – the linking together of a condition and outcomes, algorithm, program, debug, implement, question, answer, task, input, outcomes, test, run, setup, share, evaluate, constructive

Required Prior Knowledge

This unit assumes that learners will have prior experience of programming using block-based construction (e.g. Scratch), understand the concepts of 'sequence' and 'repetition', and have some experience of using 'selection'. Ideally, learners will have completed 'Programming A – Selection in physical computing' before undertaking this unit, as this will provide them with the required knowledge of 'selection'.

Endpoint

Lesson 1: To explain how selection is used in computer programs

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I can recall how conditions are used in selection I can identify conditions in a program
I can modify a condition in a program

Lesson 2: To relate that a conditional statement connects a condition to an outcome
I can use selection in an infinite loop to check a conditio I can identify the condition and outcomes in an 'if… then… else…' statement
I can create a program that uses selection to produce different outcomes

Lesson 3: To explain how selection directs the flow of a program
I can explain that program flow can branch according to a condition I can design the flow of a program that contains 'if… then… else…'
I can show that a condition can direct program flow in one of two ways

Lesson 4: To design a program that uses selection
I can outline a given task I can use a design format to outline my project
I can identify the outcome of user input in an algorithm

Lesson 5: To create a program that uses selection
I can implement my algorithm to create the first section of my program I can test my program I can share my program with others

Lesson 6: 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

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Computing Year B (YEARS 2, 4 and 6)

Year B : Year 1 and 2 - IT around Us **Autumn 1** **DIGITAL LITERACY**	
Key Learning 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.	**Vocabulary** Information technology (IT), computer, barcode, scanner/scan
Required Prior Knowledge 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	
Endpoint **Lesson 1: 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	

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Lesson 2: 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

Lesson 3: To identify information technology beyond school
I can find examples of information technology I can sort IT by where it is found
I can talk about uses of information technology

Lesson 4: 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

Lesson 5: 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

Lesson 6: 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

Year B : Year 1 and 2 - Digital Photography
Autumn 2
INFORMATION TECHNOLOGY

Key Learning	**Vocabulary**
Learners will learn to recognise that different devices can be used to capture photographs and will gain experience capturing, editing, and improving photos. Finally, they will use this knowledge to recognise that images they see may not be real.	device, camera, photograph, capture, image, digital, landscape, portrait, horizontal, vertical, field of view, narrow, wide, format, framing, focal point, subject, matter, flash, focus, background, foreground, editing, filter, Pixl, changed, real

Required Prior Knowledge

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.

Endpoint

Lesson 1: To use a digital device to take a photograph
I can recognise what devices can be used to take photographs I can talk about how to take a photograph
I can explain what I did to capture a digital photo

Lesson 2: 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

Lesson 3: 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

Lesson 4: 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

Lesson 5: 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

Lesson 6: To recognise that photos can be changed
I can apply a range of photography skills to capture a photo I can recognise which photos have been changed
I can identify which photos are real and which have been changed

Year B: Year 1 and 2 - Making Music
Spring 1
INFORMATION TECHNOLOGY

Key Learning	**Vocabulary**

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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.	music, planets, Mars, Venus, war, peace, quiet, loud, feelings, emotions, pattern, rhythm, pulse, Neptune, pitch, tempo, notes, instrument, create, open, edit

Required Prior Knowledge

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.

Endpoint

Lesson 1: To say how music can make us feel
I can identify simple differences in pieces of music I can describe music using adjectives
I can say what I do and don't like about a piece of music

Lesson 2: 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

Lesson 3: To experiment with sound using a computer
I can connect images with sounds I can use a computer to experiment with pitch I can relate an idea to a piece of music

Lesson 4: To use a computer to create a musical pattern
I can identify that music is a sequence of notes I can explain how my music can be played in different ways
I can refine my musical pattern on a computer

Lesson 5: To create music for a purpose
I can create a rhythm which represents an animal I've chosen I can create my animal's rhythm on a computer
I can add a sequence of notes to my rhythm

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Lesson 6: To review and refine our computer work
I can review my work I can explain how I changed my work
I can listen to music and describe how it makes me feel

Year B: Year 1 and Year 2-Pictograms
Spring 2
DATA HANDLING

Key Learning	**Vocabulary**
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.	more than, less than, most, least, organise, data, object, tally chart, votes, total, pictogram, enter, data, tally chart, compare, count, explain, attribute, group, same, different, most popular, least popular

Required Prior Knowledge

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

Endpoint

Lesson 1: 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

Lesson 2: 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

Lesson 3: 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

Lesson 4: 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

Lesson 5: 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

Lesson 6: 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

Year B: Year 1 and Year 2- Robot algorithms
Summer 1
COMPUTER SCIENCE

Key Learning

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

Vocabulary

instruction, sequence, clear, unambiguous, algorithm, program, order, commands, prediction, artwork, design, route, mat, debugging

Required Prior Knowledge

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.

Endpoint

Lesson 1:To describe a series of instructions as a sequence
I can follow instructions given by someone else I can choose a series of words that can be acted out as a sequence
I can give clear instructions

Lesson 2: To explain what happens when we change the order of instructions
I can use the same instructions to create different algorithms I can use an algorithm to program a sequence on a floor robot
I can show the difference in outcomes between two sequences that consist of the same instructions

Lesson 3: To use logical reasoning to predict the outcome of a program
I can follow a sequence I can predict the outcome of a sequence
I can compare my prediction to the program outcome

Lesson 4 : To explain that programming projects can have code and artwork
I can explain the choices that I made for my mat design I can identify different routes around my mat
I can test my mat to make sure that it is usable

Lesson 5: To design an algorithm
I can explain what my algorithm should achieve I can create an algorithm to meet my goal
I can use my algorithm to create a program

Lesson 6: To create and debug a program that I have written
I can test and debug each part of the program I can plan algorithms for different parts of a task
I can put together the different parts of my program

Year B: Year 1 and Year 2- Introduction to quizzes
Summer 2

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COMPUTER SCIENCE

Key Learning

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.

Vocabulary

sequence, command, program, run, program, start, predict, blocks, actions, sprite, modify, match, debug, features, evaluate

Required Prior Knowledge

This unit progresses learners' knowledge and understanding of instructions in sequences and the use of logical reasoning to predict outcomes.

Endpoint

Lesson 1 : 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

Lesson 2: 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

Lesson 3: To create a program using a given design
I can work out the actions of a sprite in an algorithm I can decide which blocks to use to meet the design
I can build the sequences of blocks I need

Lesson 4: 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 d

Lesson 5: 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

Lesson 6: To decide how my project can be improved
I can compare my project to my design I can improve my project by adding features I can debug my program

Year B: Year 3 and Year 4- The Internet
Autumn 1
DIGITAL LITERACY

Key Learning

Learners will apply their knowledge and understanding of networks, to appreciate the internet as a network of networks which need to be kept secure. They will learn that the World Wide Web is part of the internet, and will be given opportunities to explore the World Wide Web for themselves in order to learn about who owns content and what they can access, add, and create. Finally, they will evaluate online content to decide how honest, accurate, or reliable it is, and understand the consequences of false information.

Vocabulary

Internet, network, router, network security, network switch, wireless access point (WAP), router, website, web page, web address, router, routing, route tracing, browser, World Wide Web, content, links, files, use, download, sharing, ownership, permission, accurate, honest, adverts

Required Prior Knowledge

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.

Endpoint

Lesson 1: To describe how networks physically connect 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

Lesson 2: 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
Lesson 3: 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

Lesson 4: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

Lesson 5: 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

Lesson 6: To evaluate the consequences of unreliable content
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

Year B: Year 3 and Year 4- Audio editing
Autumn 2
INFORMATION TECHNOLOGY

Key Learning	**Vocabulary**
Learners will identify the input device (microphone) and output devices (speaker or headphones) required to work with sound digitally. Learners will discuss the ownership of digital audio and the copyright implications of duplicating the work of others. In order to record audio themselves, learners will use Audacity to produce a podcast, which will include editing their work, adding multiple tracks,	audio, record, playback, microphone, speaker, headphones, input, output, start, stop, podcast, save, file, selection, edit, mixing, time shift, export, MP3, evaluate, feedback

and opening and saving the audio files. Finally, learners will evaluate their work and give feedback to their peers.	

Required Prior Knowledge

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.

Endpoint

Lesson 1: To identify that sound can be recorded
I can identify the input and output devices used to record and play sound I can use a computer to record audio
I can explain that the person who records the sound can say who is allowed to use it

Lesson 2: To explain that audio recordings can be edited
I can re-record my voice to improve my recording I can inspect the soundwave view to know where to trim my recording
I can discuss what sounds can be added to a podcast

Lesson 3: To recognise the different parts of creating a podcast project
I can explain how sounds can be combined to make a podcast more engaging I can save my project so the different parts remain editable
I can plan appropriate content for a podcast

Lesson 4: To apply audio editing skills independently
I can record content following my plan I can review the quality of my recordings I can improve my voice recordings

Lesson 5: To combine audio to enhance my podcast project
I can open my project to continue working on it I can arrange multiple sounds to create the effect I want
I can explain the difference between saving a project and exporting an audio file

Lesson 6: To evaluate the effective use of audio
I can listen to an audio recording to identify its strengths I can suggest improvements to an audio recording
I can choose appropriate edits to improve my podcast

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Year B: Year 3 and Year 4- Photo editing
Spring 1
INFORMATION TECHNOLOGY

Key Learning	**Vocabulary**
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.	image, edit, arrange, select, digital, crop, undo, save, search, copyright, composition, save, pixels, rotate, flip, adjustments, effects, colours, hue/saturation, sepia, version, illustrator, clone, recolour, magic wand, sharpen, brighten, fake, real, composite, background, foreground, retouch, paste, alter, publication, elements, original, font style, border, layer

Required Prior Knowledge

This unit progresses students' knowledge and understanding of digital photography and using digital devices to create media. Following this unit, learners will further develop their image editing skills in Year 5 – Vector drawing.

Endpoint

Lesson 1 : To explain that the composition of digital images can be changed
I can improve an image by rotating it I can explain why I might crop an image I can use photo editing software to crop an image

Lesson 2: To explain that colours can be changed in digital images
I can explain that different colour effects make you think and feel different things I can experiment with different colour effects
I can explain why I chose certain colour effects

Lesson 3: To explain how cloning can be used in photo editing
I can add to the composition of an image by cloning I can identify how a photo edit can be improved
I can remove parts of an image using cloning

Lesson 4: To explain that images can be combined
I can experiment with tools to select and copy part of an image I can use a range of tools to copy between images
I can explain why photos might be edited

Lesson 5: To combine images for a purpose
I can describe the image I want to create I can choose suitable images for my project I can create a project that is a combination of other images

Lesson 6: To evaluate how changes can improve an image
I can review images against a given criteria I can use feedback to guide making changes
I can combine text and my image to complete the project

Year B: Year 3 and Year 4 - Data logging
Spring 2
DATA HANDLING

Key Learning	**Vocabulary**
In this unit, learners will consider how and why data is collected over time. Learners 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. Learners 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. Learners will spend time using a computer to review and analyse data. Towards the end of the unit, learners will pose questions and then use data loggers to automatically collect the data needed to answer those questions.	data, table (layout), input device, sensor, data logger, logging, data point, interval, analyse, import, export, logged, collection, analyse, review, conclusion

Required Prior Knowledge

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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).

Endpoint

Lesson 1: To explain that data gathered over time can be used to answer questions
I can choose a data set to answer a given question I can suggest questions that can be answered using a given data set
I can identify data that can be gathered over time

Lesson 2: To use a digital device to collect data automatically
I can explain what data can be collected using sensors I can use data from a sensor to answer a given question
I can identify that data from sensors can be recorded

Lesson 3: To explain that a data logger collects 'data points' from sensors over time
I can recognise that a data logger collects data at given points I can identify the intervals used to collect data
I can talk about the data that I have captured

Lesson 4: To recognise how a computer can help us analyse data
I can view data at different levels of detail I can sort data to find information
I can explain that there are different ways to view data

Lesson 5: 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

Lesson 6: To use data from sensors to answer questions
I can interpret data that has been collected using a data logger I can draw conclusions from the data that I have collected
I can explain the benefits of using a data logger

Year B: Year 3 and Year 4 - Repetition in shapes

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Summer 1
COMPUTER SCIENCE

Key Learning	**Vocabulary**
Learners will create programs by planning, modifying, and testing commands to create shapes and patterns. They will use Logo, a text-based programming language.	program, turtle, commands, code, snippet, algorithm, design, debug, logo commands, pattern, repeat, repetition, count-controlled loop, value, decompose, procedure

Required Prior Knowledge

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.

Endpoint

Lesson 1: 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

Lesson 2: 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

Lesson 3: To explain what 'repeat' means
I can identify repetition in everyday tasks I can identify patterns in a sequence
I can use a count-controlled loop to produce a given outcome

Lesson 4: 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

Lesson 5: To decompose a task into small steps

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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

Lesson 6: 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

Year B: Year 3 and Year 4 - Repetition in games
Summer 2
COMPUTER SCIENCE

Key Learning

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.

Vocabulary

Scratch, programming, sprite, blocks, code, loop, repeat, value, forever, infinite loop, count-controlled loop, animate, costume, event block, duplicate, modify, debug, refine, evaluate, algorithm

Required Prior Knowledge

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.

Endpoint

Lesson 1 :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

Lesson 2: 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

Lesson 3: 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

Lesson 4: To modify an infinite loop in a given program
I can identify which parts of a loop can be changed I can explain the effect of my changes
I can re-use existing code snippets on new sprites

Lesson 5: 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

Lesson 6: To create a project that includes repetition
I can refine the algorithm in my design I can build a program that follows my design
I can evaluate the steps I followed when building my project

Year B: Year 5 and Year 6- Communication
Autumn 1
DIGITAL LITERACY

Key Learning	**Vocabulary**
In this unit learners explore how data is transferred over the internet. Learners initially focus on addressing, before they move on to the	search, search engine, Google, Bing, Yahoo, Swisscows, DuckDuckGo, refine. index, crawler, bot, optimisation, links,

makeup and structure of data packets. Learners then look at how the internet facilitates online communication and collaboration; they complete shared projects online and evaluate different methods of communication. Finally, they learn how to communicate responsibly by considering what should and should not be shared on the internet.	web crawlers, content creator, ranking, communication, internet, public, private, one-way, two-way, one-to-one, one-to-many, SMS, email, WhatsApp, blog, YouTube, Twitter, BBC Newsround

Required Prior Knowledge

This unit progresses learners' knowledge and understanding of computing systems and online collaborative working.

Endpoint

Lesson 1: To explain the importance of internet addresses
I can recognise that data is transferred using agreed methods I can explain that internet devices have addresses
I can describe how computers use addresses to access websites

Lesson 2: To recognise how data is transferred across the internet
I can identify and explain the main parts of a data packet I can explain that data is transferred over networks in packets
I can explain that all data transferred over the internet is in packets

Lesson 3: To explain how sharing information online can help people to work together
I can recognise how 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

Lesson 4: To evaluate different ways of working together online
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

Lesson 5: 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 to communicate over the internet

I can choose methods of communication to suit particular purposes

Lesson 6: To evaluate different methods of online communication

I can compare different methods of communicating on the internet
I can explain that communication on the internet may not be private
I can decide when I should and should not share information online

Year B: Year 5 and Year 6 - 3D Modelling
Autumn 2
INFORMATION TECHNOLOGY

Key Learning

Learners will develop their knowledge and understanding of using a computer to produce 3D models. Learners will initially familiarise themselves with working in a 3D space, moving, resizing, and duplicating objects. They will then create hollow objects using placeholders and combine multiple objects to create a model of a desk tidy. Finally, learners will examine the benefits of grouping and ungrouping 3D objects, then go on to plan, develop, and evaluate their own 3D model of a building.

Vocabulary

2D, 3D, 3D object, 3D space, view, resize, colour, lift, rotate, position, select, duplicate, dimensions, placeholder, hole, group, ungroup, modify, evaluate, improve

Require Prior Knowledge

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.

Endpoint

Lesson 1: To recognise that you can work in three dimensions on a computer

I can add 3D shapes to a project
I can view 3D shapes from different perspectives
I can move 3D shapes relative to one another

Lesson 2: To identify that digital 3D objects can be modified
I can resize an object in three dimensions I can lift/lower 3D objects I can recolour a 3D object

Lesson 3: To recognise that objects can be combined in a 3D model
I can rotate objects in three dimensions I can duplicate 3D objects I can group 3D objects

Lesson 4: To create a 3D model for a given purpose
I can accurately size 3D objects I can show that placeholders can create holes in 3D objects I can combine a number of 3D objects

Lesson 5: To plan my own 3D model
I can analyse a 3D model I can choose objects to use in a 3D model I can combine objects in a design

Lesson 6: To create my own digital 3D model
I can construct a 3D model based on a design I can explain how my 3D model could be improved
I can modify my 3D model to improve it

Year B: Year 5 and Year 6 - Web page Creation
Spring 1
INFORMATION TECHNOLOGY

Key Learning

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.

Vocabulary

website, web page, browser, media, Hypertext Markup Language (HTML), layout, header, media, purpose, copyright, fair use, evaluate, preview, device, breadcrumb, trail, navigation, hyperlink, subpage, implication, external link, embed

Required Prior Knowledge

This unit progresses students' knowledge and understanding of the following: digital writing, digital painting, desktop publishing, digital

photography, photo editing, and vector drawing.

Endpoint

Lesson 1: 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

Lesson 2: 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

Lesson 3: 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'

Lesson 4: To recognise the need to preview pages
I can add content to my own web page I can preview what my web page looks like
I can evaluate what my web page looks like on different devices and suggest/make edits.

Lesson 5: 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

Lesson 6: 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

Year B: Year 5 and Year 6 - Spreadsheets
Spring 2
DATA HANDLING

Key Learning	**Vocabulary**

Together we learn, grow and dream

This unit introduces the learners to spreadsheets. They will be supported in organising data into columns and rows to create their own data set. Learners will be taught the importance of formatting data to support calculations, while also being introduced to formulas and will begin to understand how they can be used to produce calculated data. Learners will be taught how to apply formulas that include a range of cells, and apply formulas to multiple cells by duplicating them. Learners will use spreadsheets to plan an event and answer questions. Finally, learners will create charts, and evaluate their results in comparison to questions asked.	spreadsheet, data, data heading, data set, cells, columns and rows, data item, format, common attribute, formula, calculation, call reference, sigma, graph, evaluate, results, comparisons, questions, software, tools, data, propose

Required Prior Knowledge

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.

Endpoint

Lesson 1: To create a data set in a spreadsheet
I can collect data I can suggest how to structure my data I can enter data into a spreadsheet

Lesson 2: To build a data set in a spreadsheet
I can explain what an item of data is I can choose an appropriate format for a cell I can apply an appropriate format to a cell

Lesson 3: To explain that formulas can be used to produce calculated data
I can explain which data types can be used in calculations I can construct a formula in a spreadsheet
I can identify that changing inputs changes outputs

Lesson 4: To apply formulas to data
I can calculate data using different operations I can create a formula which includes a range of cells
I can apply a formula to multiple cells by duplicating it

Lesson 5: To create a spreadsheet to plan an event

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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 questio**ns**
Lesson 6: To choose suitable ways to present data
I can produce a chart I can use a chart to show the answer to a question I can suggest when to use a table or chart

Year B: Year 5 and Year 6 - Variables in games
Summer 1
COMPUTER SCIENCE

Key Learning

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

Vocabulary

variable, change, name, value, set, design, algorithm, code, task, artwork, program, project, code, test, debug, improve, evaluate, share

Required Prior Knowledge

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.

Endpoint

Lesson 1: To define a 'variable' as something that is changeable

I can identify examples of information that is variable I can explain that the way a variable changes can be defined
I can identify that variables can hold numbers or letters

Lesson 2: To explain why a variable is used in a program
I can identify a program variable as a placeholder in memory for a single value I can explain that a variable has a name and a value
I can recognise that the value of a variable can be changed

Lesson 3: 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

Lesson 4: To design a project that builds on a given example
I can choose the artwork for my project I can create algorithms for my project
I can explain my design choices

Lesson 5: 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

Lesson 6: To evaluate my project
I can identify ways that my game could be improved I can use variables to extend my game
I can share my game with others

Year B: Year 5 and Year 6 - Sensing
Summer 2
COMPUTER SCIENCE

Key Learning	**Vocabulary**
This unit is the final KS2 programming unit and brings together elements of all the four programming constructs: sequence from Year 3, repetition from Year 4, selection from Year 5, and variables (introduced in Year 6 – 'Programming A'. It offers pupils the opportunity to use all of these constructs in a different, but still	Micro-bit, MakeCode, input, process, output, flashing, USB, selection, condition, if… then… else, variable, random, navigation, design, task, step counter, plan, create, code, test, debug

familiar environment, while also utilising a physical device — the micro:bit. The unit begins with a simple program for pupils to build in and test within the new programming environment, before transferring it to their micro:bit. Pupils then take on three new projects in Lessons 2, 3, and 4, with each lesson adding more depth.	

Required Prior Knowledge

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.

Endpoint

Lesson 1: 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

Lesson 2: 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

Lesson 3: To update a variable with a user input
I can use a condition to change a variable I can experiment with different physical inputs
I can explain that checking a variable doesn't change its value

Lesson 4: To use an conditional statement to compare a variable to a value
I can use an operand (e.g. <>=) in an if, then statement I can explain the importance of the order of conditions in else, if statements
I can modify a program to achieve a different outcome

Lesson 5: 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

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Lesson 6: 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