

Cooper Perry Computing Progression

EYFS

Topic	Links to National Curriculum	Prior learning	Key Questions	Looking forward	Vocabulary	Concepts	Enrichment and engagement opportunities
			IN LINE WITH THE NATIONAL CURRICULUM’S REMOVAL OF TECHNOLOGY FROM THE EARLY YEARS FOUNDATION STAGE CURRICULUM (SEPTEMBER 2021), FORMAL TEACHING OF COMPUTING DOES NOT START UNTIL KEY STAGE 1.				

Year 1

Topic	Links to National Curriculum	Prior learning	Key Questions	Looking forward	Vocabulary	Concepts	Enrichment and engagement opportunities
<u>Computing systems and networks – Technology around us</u>	- Recognise common uses of information technology beyond school - Use technology purposefully to create, organise, store, manipulate, and retrieve digital content - Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.	As this is the first Year 1 unit, no prior knowledge is assumed	Can the class: - Describe the functions of various freehand tools. - Acknowledge the capability of computers to produce diverse forms of art. - Understand that tools can be modified - Define the purposes of different freehand instruments. - Reflect on the implications of the decisions made. - Assess the effectiveness of their approach in fulfilling the task's objectives.	Y2- IT Around us Y3- Connecting Computers Y4- The Internet Y5- Systems and Searching Y6- Communication & Collaboration	technology, computer, mouse, trackpad, keyboard, screen, double-click, typing.	- Identify the main parts of a computer - Use a keyboard to type their name on a computer - Turn on the computer and log on with an aid - Use a mouse in different ways – click, select and drag - Use the keyboard to edit text and delete letters - Demonstrate that they can use technology safely	Arm School Program A project-based learning activity combined with physical computing. Offers innovation with skills & knowledge.
<u>Creating media – Digital painting</u>	Computing Use technology purposefully to create, organise, store, manipulate, and retrieve digital content Art and Design	Y1- Technology around us	Can the class: - Describe the functions of various freehand tools. - Acknowledge the capability of computers to produce diverse forms of art. - Understand that tools can be modified and delineate the purposes of different freehand instruments. - Reflect on the implications of the decisions	Y1- Digital Painting Y1- Digital Writing Y2- Digital Photography Y2- Digital Music	paint program, tool, paintbrush, erase, fill, undo, shape tools, line tool, fill tool, undo tool, colour, brush style, brush size, pictures, painting, computers	- Explain what different freehand tools do - Recognise that computers can be used to create a range of art - Recognise a tool can be adjusted - Explain what different freehand tools do - Recognise that computers can be used to create a range of art - Recognise a tool can be adjusted	Moon Camp- Pupils can explore and design their own settlement in the solar system with a 3D modelling tool.

	- To develop a wide range of art and design techniques in using colour, pattern, texture, line, shape, form, and space - About the work of a range of artists, craft makers, and designers, describing the differences and similarities between different practices and disciplines and making links to their own work -		made. • Assess the effectiveness of their approach in fulfilling the task's objectives.	Y3- Stop Frame Animation Y3- Desktop publishing Y4- Audio production Y5- Photo editing Y5- Video production Y5- Introduction to vector graphics Y6- Web page creation Y6- 3D Modelling		• Consider the impact of choices made • Evaluate how successful they were in meeting the task requirements • Identify the differences between painting on a computer and on paper, and explain their own preference	
<u>Programming A – Moving a robot</u>	Computing • understand what algorithms are; how they are implemented as programs on digital devices; and those programs execute by following precise and unambiguous instructions • create and debug simple programs • use logical reasoning to predict the behaviour of simple programs • recognise common uses of information technology beyond school Maths Measure • sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]	No prior programming knowledge assumed	Can the class: • Explain what a given command does • Act out a given word • Combine ‘forwards’ and ‘backwards’ commands to make a sequence • Combine four direction commands to make sequences • Plan a simple program • Find more than one solution to a problem	Y2- Robot algorithms Y3- Sequencing sounds Y4- Repetition in shapes Y5- Selection in physical computing Y6- Variables in games	Bee-Bot, forwards, backwards, turn, clear, go, commands, instructions, directions, left, right, route, plan, algorithm, program.	• Explain what a given command does • Predict the outcome of a sequence involving up to four commands • Match a command to an outcome • Understand that a program is a set of commands that a computer can run • Know that a series of instructions can be issued before they are enacted • Predict the outcome of a command on a device • Run a command on a floor robot • Choose a command for a given purpose • Choose a series of words that can be enacted as a program • Build a sequence of commands in steps from a given starting point • Combine commands in a program • Run a program on a device • Debug a program to correct errors • Evaluate how successful they were in meeting the task requirements	Bebras Challenge A computational thinking challenge that enthuses pupils in computer science & promotes computational thinking

	Geometry - position and direction describe position, direction and movement, including whole, half, quarter and three-quarter turns						
<u>Data and information – Grouping data</u>	<u>Computing</u> - Use technology purposefully to create, organise, store, manipulate, and retrieve digital content - Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.	Y1- Technology around us	Can the class: - Label objects - Identify that objects can be counted - Describe objects in different ways - Count objects with the same properties - Compare groups of objects - Answer questions about groups of objects	Y2- Pictograms Y3- Branching databases Y4- Data logging Y5- Flat-file databases Y6- Introduction to spreadsheets	object, label, group, search, image, property, colour, size, shape, value, data set, more, less, most, fewest, least, the same	- Explain how objects have been grouped - Know that labels are used to identify a group with similar characteristics - Group the same objects in more than one way - Count how many objects are in group and identify which has more - Record how many objects are in a group - Group objects to answer a question - Compare objects to group them explaining what has been found - Evaluate how successful they were in meeting the task requirements	Bebras Challenge A computational thinking challenge that enthuses pupils in computer science & promotes computational thinking
<u>Creating media – Digital writing</u>	<u>Computing</u> - Use technology purposefully to create, organise, store, manipulate, and retrieve digital content - Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies. <u>English – writing (Y1)</u> Write sentences by: - saying out loud what they are going to write about - composing a sentence orally before writing it - sequencing sentences to form short narratives - e-reading what they have written to check that it makes sense	Y1- Digital Painting	Can the class: - Use a computer to write - Add and remove text on a computer - Identify that the look of text can be changed on a computer - Make careful choices when changing text - Explain why they used the tools that were chosen - Compare typing on a computer to writing on paper	Y2- Digital Photography Y2- Digital Music Y3- Stop Frame Animation Y3- Desktop publishing Y4- Audio production Y5- Photo editing Y5- Video production Y5- Introduction to vector graphics Y6- Web page creation Y6- 3D Modelling	word processor, keyboard, keys, letters, type, numbers, space, backspace, text cursor, capital letters, toolbar, bold, italic, underline, mouse, select, font, undo, redo, format, compare, typing, writing.	- Know that a keyboard is used to enter text into a computer - Know that the appearance of text can be changed - Recognise some keys and use them to enter text on to a computer/device including some basic punctuation - Add spaces between most words using a space bar - Use the backspace key to delete text only as far as the section to be edited - Use the toolbar to find and use the bold, italic, and underline tool - Evaluate how successful they were in meeting the task requirements - Identify the differences between writing on a computer and on paper, and explain their own preference	Moon Camp- Pupils can explore and design their own settlement in the solar system with a 3D modelling tool.

<u>Programming B - Programming animations</u>	<u>Computing</u> • Understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions • Create and debug simple programs • Use logical reasoning to predict the behaviour of simple programs <u>Maths</u> Measure • Sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening] Geometry - position and direction Describe position, direction and movement, including whole, half, quarter and three-quarter turns	No prior knowledge assumed	Can the class: • Choose a command for a given purpose • Show that a series of commands can be joined together • Identify the effect of changing a value • Explain that each sprite has its own instructions • Design the parts of a project • Use an algorithm to create a program	Y1- Programming animations Y2- Programming Quizzes Y3- Events and actions in programs Y4- Repetition in games Y5- Selection in quizzes Y6- Sensing movement	ScratchJr, command, sprite, compare, programming, area, block, joining, start, run, program, background, delete, reset, algorithm, predict, effect, change, value, instructions, design.	• Explain what a sprite is • Compare different programming blocks • Know a series of commands can be joined together to form a program • Understand that a program is a set of commands a computer can run • Predict the outcome of a command • List commands that can be used on a device • Match a command to an outcome • Recognise how to run a command • Run different commands for different sprites • Choose a command for a given purpose • Build a sequence of commands in steps • Use the start command to initialise a program • Debug a program • Test a program created and evaluate how successful it has been • Identify how closely a plan matches the outcome	Bebras Challenge A computational thinking challenge that enthuses pupils in computer science & promotes computational thinking

Year 2

Topic	Links to National Curriculum	Prior learning	Key Questions	Looking forward	Vocabulary	Concepts	Enrichment and engagement opportunities
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<u>Computing systems and networks – IT around us</u>	<u>Computing</u> • Use technology purposefully to create, organise, store, manipulate, and retrieve digital content • Recognise common uses of information technology beyond school • Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies <u>Education for a Connected World links</u> Health, well-being, and lifestyle • <u>say how those rules / guides can help anyone accessing online technologies</u> <u>Maths</u> • add and subtract numbers using concrete objects, pictorial representations, and mentally (Lesson 4)	Y1- Technology around us	Can the class: - Recognise the uses and features of information technology - Identify the uses of information technology in the school - Identify information technology beyond school - Explain how information technology helps us - Explain how to use information technology safely - Recognise that choices are made when using information technology •	Y3- Connecting Computers Y4- The Internet Y5- Systems and Searching Y6- Communication & Collaboration	Information technology (IT), computer, barcode, scanner/scan	• Identify examples of computers • Describe some uses of computers • Identify that a computer is a part of IT identify examples of IT • Sort school IT by what it's used for • Identify that some IT can be used in more than one way find examples of information technology • Sort IT by where it is found • Talk about uses of information technology • Recognise common types of technology • Demonstrate how IT devices work together • Say why we use IT • List different uses of information technology • Talk about different rules for using IT • Say how rules can help keep me safe • Identify the choices that I make when using IT • Use IT for different types of activities • Explain the need to use IT in different ways	Arm School Program A project-based learning activity combined with physical computing. Offers innovation with skills & knowledge.
<u>Creating media – Digital photography</u>	<u>Computing</u> • Use technology purposefully to create, organise, store, manipulate, and retrieve digital content • Recognise common uses of information technology beyond school • Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the	Y1- Digital Painting Y1- Digital Writing	Can the class: • Take a photograph using a simple camera or device that has been set up in camera mode • Identify some of the reasons why a photograph may be good or bad • Experiment when taking photos with different light sources • Identify a photo that has been enhanced using tools when asked questions • Use different tools to change how a photograph looks • Evaluate how successful they were in meeting the task requirements	Y2- Digital Music Y3- Stop Frame Animation Y3- Desktop publishing Y4- Audio production Y5- Photo editing Y5- Video production	device, camera, photograph, capture, image, digital, landscape, portrait, framing, subject, compose, light sources, flash, focus, background, editing, filter, format, framing, lighting,	• Recognise what devices can be used to take photographs • Talk about how to take a photograph • Explain what I did to capture a digital photo • Explain the process of taking a good photograph • Take photos in both landscape and portrait format • Explain why a photo looks better in portrait or landscape format • Identify what is wrong with a photograph • Discuss how to take a good photograph • Improve a photograph by retaking it	Moon Camp- Pupils can explore and design their own settlement in the solar system with a 3D modelling tool.

	internet or other online technologies <u>Art and design</u> To develop a wide range of art and design techniques in using colour, pattern, texture, line, shape, form, and space (Lessons 4 and 5)			Y5- Introduction to vector graphics Y6- Web page creation Y6- 3D Modelling		- Explore the effect that light has on a photo - Experiment with different light sources - Explain why a picture may be unclear - Recognise that images can be changed - Use a tool to achieve a desired effect - Explain my choices - Apply a range of photography skills to capture a photo - Recognise which photos have been changed - Identify which photos are real and which have been changed	
<u>Programming A – Robot algorithms</u>	<u>Computing</u> - Understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions - Create and debug simple programs - Use logical reasoning to predict the behaviour of simple programs <u>Maths</u> Measure ∉ sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening] Geometry - position and direction ∉ describe position, direction and movement, including whole, half, quarter and three-quarter turns	Y1- Moving a robot	Can the class: - Understand a series of instructions - Understand different algorithms by changing the sequence of commands - Predict what a sequence of commands will do - Follow sequences of instructions including moving forwards and backwards, and turning left and right. - Plan a series of instructions for someone else to follow - Plan and execute a program to reach a goal and debug as needed	Y3- Sequencing sounds Y4- Repetition in shapes Y5- Selection in physical computing Y6- Variables in games	instruction, sequence, clear, unambiguous, algorithm, program, order, prediction, artwork, design, route, mat, debugging, decomposition	- Follow instructions given by someone else - Choose a series of words that can be acted out as a sequence - Give clear instructions - Use the same instructions to create different algorithms - Use an algorithm to program a sequence on a floor robot - Show the difference in outcomes between two sequences that consist of the same instructions - Follow a sequence - Predict the outcome of a sequence - Compare my prediction to the program outcome - Explain the choices that I made for my mat design - Identify different routes around my mat - Test my mat to make sure that it is usable - Explain what my algorithm should achieve - Create an algorithm to meet my goal - Use my algorithm to create a program - Test and debug each part of the program - Plan algorithms for different parts of a task - Put together the different parts of my program	Bebras Challenge A computational thinking challenge that enthuses pupils in computer science & promotes computational thinking

<u>Data and information – Pictograms</u>	<u>Computing</u> • use technology purposefully to create, organise, store, manipulate and retrieve digital content • use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies <u>Maths</u> Building on Year 1 number and place value: • Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: ‘equal to’, ‘more than’, ‘less than’ (‘fewer’), ‘most’, ‘least’ Year 2 • interpret and construct simple pictograms, tally charts, block diagrams and simple tables • ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity • ask and answer questions about totalling and comparing categorical data	Y1- Grouping data	Can the class: - Recognise that we can count and compare objects using tally charts - Recognise that objects can be represented as pictures - Create a pictogram - Select objects by attribute and make comparisons - Select objects by attribute and make comparisons - Explain that we can present information using a computer	Y3- Branching databases Y4- Data logging Y5- Flat-file databases Y6- Introduction to spreadsheets	more than, less than, most, least, common, popular, organise, data, object, tally chart, votes, total, pictogram, enter, data, compare, objects, count, explain, attribute, group, same, different, conclusion, block diagram, sharing	• Record data in a tally chart • Represent a tally count as a total • Compare totals in a tally chart • Enter data onto a computer • Use a computer to view data in a different format • Use pictograms to answer simple questions about objects • Organise data in a tally chart • Use a tally chart to create a pictogram • Explain what the pictogram shows • Tally objects using a common attribute • Create a pictogram to arrange objects by an attribute • Answer ‘more than’/‘less than’ and ‘most/least’ questions about an attribute • Choose a suitable attribute to compare people • Collect the data I need • Create a pictogram and draw conclusions from it • Use a computer program to present information in different ways • Share what I have found out using a computer • Give simple examples of why information should not be shared	Bebras Challenge A computational thinking challenge that enthuses pupils in computer science & promotes computational thinking
<u>Creating media - Digital music</u>	<u>Computing national curriculum links</u> • Use technology purposefully to create, organise, store, manipulate, and retrieve digital content • Use technology safely and respectfully, keeping personal information private; identify where to go for help and support	Y1- Digital Painting Y1- Digital Writing Y2- Digital Photography	Can the class: • Say how music can make us feel • Identify that there are patterns in music • Experiment with sound using a computer • Use a computer to create a musical pattern • Create music for a purpose • Review and refine their computer work	Y3- Stop Frame Animation Y3- Desktop publishing Y4- Audio production Y5- Photo editing	music, quiet, loud, feelings, emotions, pattern, rhythm, pulse, pitch, tempo, rhythm, notes, create, emotion, beat,	• Reflect on a piece of music • Follow a rhythm pattern • Understand that a computer can generate different sounds • Understand that a computer can be used to make a sequence of notes • Understand how pattern and rhythm can be used to depict an animal	Moon Camp- Pupils can explore and design their own settlement in the solar system with a 3D modelling tool.

	when they have concerns about content or contact on the internet or other online technologies <u>Music national curriculum links</u> • Play tuned and untuned instruments musically • Listen with concentration and understanding to a range of high-quality live and recorded music • Experiment with, create, select, and combine sounds using the interrelated dimensions of music			Y5- Video production Y5- Introduction to vector graphics Y6- Web page creation Y6- 3D Modelling	instrument, open, edit.	• Create and follow a rhythm pattern using two different instruments • Use the computer to generate different sounds represented by images • Create a sequence of notes on the computer and start to refine them • Create a sequence of notes that use rhythm and tempo to link with a chosen animal, refining their work	
<u>Programming B - programming quizzes</u>	<u>Computing</u> • Understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions • Create and debug simple programs • Use logical reasoning to predict the behaviour of simple programs • Use technology purposefully to create, organise, store, manipulate and retrieve digital content • Use logical reasoning to predict the behaviour of simple programs <u>Maths</u> Measure • sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening] Geometry - position and direction	Y1- Programming animations	Can the class: • Explain that a sequence of commands has a start • Explain that a sequence of commands has an outcome • Create a program using a given design • Change a given design • Create a program using their own design • Decide how a project can be improved	Y3- Events and actions in programs Y4- Repetition in games Y5- Selection in quizzes Y6- Sensing movement	sequence, command, program, run, start, outcome, predict, blocks, design, actions, sprite, project, modify, change, algorithm, build, match, compare, debug, features, evaluate, decomposition, code.	• Know that a sequence can be started using a variety of event blocks • Know that sequence has an outcome, and identify different programs that have the same outcome • Know the backgrounds can be changed through the programming blocks • Understand the role of the numbers on ScratchJr blocks • Write and run a simple program with a start block, and an end block which changes the background • Adapt a given design to create a program with multiple sprites and backgrounds which uses the blocks given in the example • Create and program a quiz with at least two backgrounds which switch based on an action • Identify errors in their program, and debug them • Test a program created and evaluate how successful it has been • Identify how closely a plan matches the outcome	Bebras Challenge A computational thinking challenge that enthuses pupils in computer science & promotes computational thinking

	describe position, direction and movement, including whole, half, quarter and three-quarter turns						
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Year 3

Topic	Links to National Curriculum	Prior learning	Key Questions	Looking forward	Vocabulary	Concepts	Enrichment and engagement opportunities
Computing systems and networks – Connecting computers	Computing • use sequence, selection, and repetition in programs; work with variables and various forms of input and output • understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web; and the opportunities they offer for communication and collaboration • select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information • use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact Education for a Connected World links Privacy and Security • describe simple strategies for creating and keeping passwords private.	Y1- Technology around us Y2- IT Around us	Can the class: - Explain how digital devices function - Identify input and output devices - Recognise how digital devices can change the way that we work - Explain how a computer network can be used to share information - Explore how digital devices can be connected - Recognise the physical components of a network	Y4- The Internet Y5- Systems and Searching Y6- Communication & Collaboration	digital device, input, process, output, program, digital, non-digital, connection, network, switch, server, wireless access point, cables, sockets	• Explain that digital devices accept inputs • Explain that digital devices produce outputs • Follow a process • Explain what makes a secure password • Classify input and output devices • Describe a simple process • Design a digital device • Explain how I use digital devices for different activities • Recognise similarities between using digital devices and using non-digital tools • Suggest differences between using digital devices and using non-digital tools • Recognise different connections • Explain how messages are passed through multiple connections • Discuss why we need a network switch • Recognise that a computer network is made up of a number of devices • Demonstrate how information can be passed between devices • Explain the role of a switch, server, and wireless access point in a network • Identify how devices in a network are connected together • Identify networked devices around me • Identify the benefits of computer networks	Arm School Program A project-based learning activity combined with physical computing. Offers innovation with skills & knowledge.

	<u>Maths</u> (Lesson 1) • Number and place value: solve number problems and practical problems involving these ideas. <u>Art</u> (Lesson 3) • to improve their mastery of art and design techniques, including drawing, painting and sculpture with a range of materials [for example, pencil, charcoal, paint, clay]						
<u>Creating media - Stop-frame animation</u>	• select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information • use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact	Y1- Digital Painting Y1- Digital Writing Y2- Digital Photography Y2- Digital Music	Can the class: - Explain that animation is a sequence of drawings or photographs - Relate animated movement with a sequence of images - Plan an animation - Identify the need to work consistently and carefully - Review and improve an animation - Evaluate the impact of adding other media to an animation	Y3- Desktop publishing Y4- Audio production Y5- Photo editing Y5- Video production Y5- Introduction to vector graphics Y6- Web page creation Y6- 3D Modelling	animation, flip book, stopframe, frame, sequence, image, photograph, setting, character, events, onion skinning, consistency, evaluation, delete, media, import, transition	• Draw a sequence of pictures • Create an effective flip book—style animation • Explain how an animation/flip book works • Predict what an animation will look like • Explain why little changes are needed for each frame • Create an effective stop-frame animation • Break down a story into settings, characters and events • Describe an animation that is achievable on screen • Create a storyboard • Use onion skinning to help me make small changes between frames • Review a sequence of frames to check my work • Evaluate the quality of my animation • Explain ways to make my animation better • Evaluate another learner’s animation • Improve their animation based on feedback • Add other media to their animation • Explain why they added other media to my animation • Evaluate a final film	Moon Camp- Pupils can explore and design their own settlement in the solar system with a 3D modelling tool.

<u>Programming A - Sequencing sounds</u>	- Design, write, and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts - Use sequence, selection, and repetition in programs; work with variables and various forms of input and output - Use logical reasoning to explain how some simple algorithms work, and to detect and correct errors in algorithms and programs - Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information	Y1- Moving a robot Y2- Robot algorithms	Can the class: - Explore a new programming environment - Identify that commands have an outcome - Explain that a program has a start - Recognise that a sequence of commands can have an order - Change the appearance of my project - Create a project from a task description	Y4- Repetition in shapes Y5- Selection in physical computing Y6- Variables in games	Scratch, programming, blocks, commands, code, sprite, costume, stage, backdrop, motion, turn, point in direction, go to, glide, sequence, event, task, design, run the code, order, note, chord, algorithm, bug, debug, code.	- Identify the objects in a Scratch project (sprites, backdrops) - Explain that objects in Scratch have attributes (linked to) - Recognise that commands in Scratch are represented as blocks - Create a program following a design and understand that each sprite is controlled by the commands I choose - Predict the coding blocks used to move a sprite - Match coding blocks to their actions - Start a program in different ways - Create a sequence of connected commands - Explain that the objects in my project will respond exactly to the code - Explain what a sequence is - Combine sound commands - Order notes into a sequence - Build a sequence of commands - Decide the actions for each sprite in a program - Make design choices for my artwork - Identify and name the objects I will need for a project - Relate a task description to a design - Implement my algorithm as code	Code Club Code Club is a network of free coding clubs where KS2 pupils can learn to create games, animations and websites It is provided to teachers with all the tools to set it up, with no previous coding experience needed..
<u>Data and information – Branching databases</u>	Computing - select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information - use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact Science (Lower Key Stage 2)	Y1- Grouping data Y2- Pictograms	Can the class: - Create questions with yes/no answers - Identify the attributes needed to collect data about an object - Create a branching database - Explain why it is helpful for a database to be well structured - Plan the structure of a branching database - Independently create an identification tool	Y4- Data logging Y5- Flat-file databases Y6- Introduction to spreadsheets	attribute, value, questions, table, objects, branching, database, objects, equal, even, separate, structure, compare, order, organise, selecting, information, decision tree	- Investigate questions with yes/no answers - Make up a yes/no question about a collection of objects - Create two groups of objects separated by one attribute - Select an attribute to separate objects into groups - Create a group of objects within an existing group - Arrange objects into a tree structure - Select objects to arrange in a branching database - Group objects using their own yes/no questions - Test my branching database to see if it works - Create yes/no questions using given attributes - Compare two branching database structures - Explain that questions need to be ordered carefully to split objects into similarly sized groups	Arm School Program A project-based learning activity combined with physical computing. Offers innovation with skills & knowledge.

	- gathering, recording, classifying and presenting data in a variety of ways to help in answering questions Maths - Statistics: interpret and present data using bar charts, pictograms and tables					- Independently create questions to use in a branching database - Create questions that will enable objects to be uniquely identified - Create a physical version of a branching database - Create a branching database that reflects a plan - Work with a partner to test a identification tool - Suggest real-world uses for branching databases	
<u>Creating media – Desktop publishing</u>	Computing - Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content - Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information <u>English programmes of study links</u> - Pupils should be taught to draft and write by: in non-narrative material, using simple organisational devices [for example, headings and subheadings] - Evaluate and edit by assessing the effectiveness of their own and others’ writing and suggesting improvements - Proofread for spelling and punctuation errors <u>Education for a Connected World links</u>	Y1- Digital Painting Y1- Digital Writing Y2- Digital Photography Y2- Digital Music Y3- Stop Frame Animation	Can the class: - Recognise how text and images convey information - Recognise that text and layout can be edited - Choose appropriate page settings - Add content to a desktop publishing publication - Consider how different layouts can suit different purposes - Consider the benefits of desktop publishing	Y4- Audio production Y5- Photo editing Y5- Video production Y5- Introduction to vector graphics Y6- Web page creation Y6- 3D Modelling	text, images, advantages, disadvantages, communicate, font, style, landscape, portrait, orientation, placeholder, template, layout, content, desktop publishing, copy, paste, purpose, benefits	- Explain the difference between text and images - Recognise that text and images can communicate messages clearly - Identify the advantages and disadvantages of using text and images - Understand how to use emojis respectfully online - Change font style, size, and colours for a given purpose - Edit text - Explain that text can be changed to communicate more clearly - Explain what ‘page orientation’ means - Recognise placeholders and say why they are important - Create a template for a particular purpose - Choose the best locations for my content - Paste text and images to create a magazine cover - Make changes to content after I’ve added it - Identify different layouts - Match a layout to a purpose - Choose a suitable layout for a given purpose - Identify the uses of desktop publishing in the real world - Say why desktop publishing might be helpful - Compare work made on desktop publishing to work created by hand	Moon Camp- Pupils can explore and design their own settlement in the solar system with a 3D modelling tool.

	Managing online information • use key phrases in search engines • use search technologies effectively Copyright and ownership • When searching on the internet for content to use, explain why I need to consider who owns it and whether I have the right to reuse it • demonstrate the use of search tools to find and access online content which can be reused by others						
<u>Programming B - Events and actions in programs</u>	<u>Computing</u> • Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information	Y1- Programming animations Y2- Programming Quizzes	Can the class: - Explain how a sprite moves in an existing project - Create a program to move a sprite in four directions - Adapt a program to a new context - Develop my program by adding features - Identify and fix bugs in a program - Design and create a maze-based challenge	Y4- Repetition in games Y5- Selection in quizzes Y6- Sensing movement	motion, event, sprite, algorithm, logic, move, resize, extension block, pen up, set up, pen, design, action, debugging, errors, setup, code, test, debug, actions.	• Explain the relationship between an event and an action • Choose which keys to use for actions and explain my choices • Identify a way to improve a program • Choose a character for my project • Choose a suitable size for a character in a maze • Program movement • Use a programming extension • Consider the real world when making design choices • Choose blocks to set up my program • Identify additional features (from a given set of blocks) • Choose suitable keys to turn on additional features • Build more sequences of commands to make my design work • Test a program against a given design • Match a piece of code to an outcome • Modify a program using a design • Make design choices and justify them • Implement my design • Evaluate my project	Code Club Code Club is a network of free coding clubs where KS2 pupils can learn to create games, animations and websites It is provided to teachers with all the tools to set it up, with no previous coding experience needed.

Topic	Links to National Curriculum	Prior learning	Key Questions	Looking forward	Vocabulary	Concepts	Enrichment and engagement opportunities
<u>Computing systems and networks – The Internet</u>	<u>Computing</u> - Understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration - Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content - Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information - Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. <u>Education for a Connected World links</u> Managing online information - analyse information to make a judgement about probable accuracy, and I understand why it is important to make my own decisions regarding content and that my decisions are respected	Y1- Technology around us Y2- IT Around us Y3- Connecting Computers	Can the class: - Describe how networks physically connect to other networks - Recognise how networked devices make up the internet - Outline how websites can be shared via the World Wide Web (WWW) - Describe how content can be added and accessed on the World Wide Web (WWW) - Recognise how the content of the WWW is created by people - Evaluate the consequences of unreliable content	Y5- Systems and Searching Y6- Communication & Collaboration	internet, network, router, security, switch, server, wireless access point (WAP), website, web page, web address, routing, web browser, World Wide Web, content, links, files, use, download, sharing, ownership, permission, information, accurate, honest, content, adverts	- Describe the internet as a network of networks - Demonstrate how information is shared across the internet - Discuss why a network needs protecting - Describe networked devices and how they connect - Explain that the internet is used to provide many services - Recognise that the World Wide Web contains websites and web pages - Explain the types of media that can be shared on the WWW - Describe where websites are stored when uploaded to the WWW - Describe how to access websites on the WWW - Explain what media can be found on websites - Recognise that a user can add content to the WWW - Explain that internet services can be used to create content online - Explain that websites and their content are created by people - Suggest who owns the content on websites - Explain that there are rules to protect content - Explain that not everything on the World Wide Web is true - Explain why some information I find online may not be honest, accurate, or legal - Explain why I need to think carefully before I share or reshare content	Arm School Program A project-based learning activity combined with physical computing. Offers innovation with skills & knowledge.

	by others. - explain what is meant by fake news, e.g. why some people will create stories or alter photographs and put them online to pretend something is true when it isn't. <u>Relationships Education, Relationships and Sex Education (RSE) and Health Education</u> Online relationships - Pupils should know how information and data is shared and used online Internet safety and Harms - Pupils should know how to be a discerning consumer of information online - Pupils should know that for most people the internet is an integral part of life and has many benefits						
<u>Creating media - Audio production</u>	<u>Computing</u> - Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content - Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information - Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of	Y1- Digital Painting Y1- Digital Writing Y2- Digital Photography Y2- Digital Music Y3- Stop Frame Animation Y3- Desktop publishing	Can the class: - Identify that sound can be recorded - Explain that audio recordings can be edited - Recognise the different parts of creating a podcast project - Apply audio editing skills independently - Combine audio to enhance my podcast project - Evaluate the effective use of audio	Y5- Photo editing Y5- Video production Y5- Introduction to vector graphics Y6- Web page creation Y6- 3D Modelling	audio, microphone, speaker, headphones, input device, output device, sound, podcast, edit, trim, align, layer, import, record, playback, selection, load, save, export, MP3, evaluate, feedback.	- identify the input and output devices used to record and play sound - use a computer to record audio - explain that the person who records the sound can say who is allowed to use it - re-record my voice to improve my recording - inspect the soundwave view to know where to trim my recording - discuss what sounds can be added to a podcast - explain how sounds can be combined to make a podcast more engaging - save my project so the different parts remain editable - plan appropriate content for a podcast - record content following my plan - review the quality of my recordings - improve my voice recordings - open my project to continue working on it - arrange multiple sounds to create the effect I want - explain the difference between saving a project and exporting an audio file - listen to an audio recording to identify its strengths	Moon Camp- Pupils can explore and design their own settlement in the solar system with a 3D modelling tool.

	ways to report concerns about content and contact <u>Education for a Connected World links</u> Copyright and ownership • When searching on the internet for content to use, explain why they need to consider who owns it and whether I have the right to reuse it • give some simple examples of content which I must not use without permission from the owner, e.g. videos, music, images. <u>Science – Year 4 (Lesson 2)</u> • Sound: Find patterns between the volume of a sound and the strength of the vibrations that produced it • Sound: Recognise that sounds get fainter as the distance from the sound source increases <u>English – Years 3 and 4 (Lesson 3)</u> • Writing – composition: Plan their writing by discussing and recording ideas • Writing – draft and write by: In non-narrative material, using simple organisational devices [for example, headings and subheadings] • Writing: Read aloud their own writing, to a group or the whole class, using appropriate intonation and controlling the tone and volume so that the meaning is clear					• Suggest improvements to an audio recording • Choose appropriate edits to improve my podcast	
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<u>Programming A – Repetition in shapes</u>	Computing - Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts - Use sequence, selection, and repetition in programs; work with variables and various forms of input and output - Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs - Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information	Y1- Moving a robot Y2- Robot algorithms Y3- Sequencing sounds	Can the class: - Identify that accuracy in programming is important - Create a program in a text-based language - Explain what ‘repeat’ means - Modify a count-controlled loop to produce a given outcome - Decompose a task into small steps - Create a program that uses count-controlled loops to produce a given outcome	Y5- Selection in physical computing Y6- Variables in games	Logo (programming environment), program, turtle, commands, code snippet, algorithm, design, debug, pattern, repeat, repetition, count-controlled loop, value, trace, decompose, procedure.	- Program a computer by typing commands - Explain the effect of changing a value of a command - Create a code snippet for a given purpose - Use a template to draw what I want my program to do - Write an algorithm to produce a given outcome - Test my algorithm in a text-based language - Identify repetition in everyday tasks - Identify patterns in a sequence - Use a count-controlled loop to produce a given outcome - Identify the effect of changing the number of times a task is repeated - Predict the outcome of a program containing a count-controlled loop - Choose which values to change in a loop - Identify ‘chunks’ of actions in the real world - Use a procedure in a program - Explain that a computer can repeatedly call a procedure - Design a program that includes count-controlled loops - Make use of my design to write a program - Develop my program by debugging it	Code Club Code Club is a network of free coding clubs where KS2 pupils can learn to create games, animations and websites It is provided to teachers with all the tools to set it up, with no previous coding experience needed..
<u>Data and information – Data logging</u>	Computing - Use sequence, selection, and repetition in programs; work with variables and various forms of input and output - Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information Science – Lower key stage 2/Year 4 - Making systematic and careful observations and, where	Y1- Grouping data Y2- Pictograms Y3- Branching databases	Can the class: - Explain that data gathered over time can be used to answer questions - Use a digital device to collect data automatically - Explain that a data logger collects ‘data points’ from sensors over time - Recognise how a computer can help us analyse data - Identify the data needed to answer questions - Use data from sensors to answer questions	Y5- Flat-file databases Y6- Introduction to spreadsheets	data, table, layout, input device, sensor, logger, logging, data point, interval, analyse, dataset, import, export, logged, collection, review, conclusion.	- Choose a data set to answer a given question - Suggest questions that can be answered using a given data set - Identify data that can be gathered over time - Explain what data can be collected using sensors - Use data from a sensor to answer a given question - Identify that data from sensors can be recorded - Recognise that a data logger collects data at given points - Identify the intervals used to collect data - Talk about the data that I have captured - View data at different levels of detail - Sort data to find information - Explain that there are different ways to view data - Propose a question that can be answered using logged data - Plan how to collect data using a data logger	Arm School Program A project-based learning activity combined with physical computing. Offers innovation with skills & knowledge.

	appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. - They should learn how to use new equipment, such as data loggers, appropriately. They should collect data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data. Maths - interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. - solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.					- Use a data logger to collect data - Interpret data that has been collected using a data logger - Draw conclusions from the data that I have collected - Explain the benefits of using a data logger	
<u>Creating media – Photo editing</u>	Computing - Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information - Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact	Y1- Digital Painting Y1- Digital Writing Y2- Digital Photography Y2- Digital Music Y3- Stop Frame Animation Y3- Desktop publishing Y4- Audio production	Can the class: - Explain that the composition of digital images can be changed - Explain that colours can be changed in digital images - Explain how cloning can be used in photo editing - Explain that images can be combined - Combine images for a purpose - Evaluate how changes can improve an image	Y5- Video production Y5- Introduction to vector graphics Y6- Web page creation Y6- 3D Modelling	image, edit, digital, crop, rotate, undo, save, adjustments, effects, colours, hue, saturation, sepia, vignette, image, retouch, clone, select, combine, made up, real, composite, cut, copy, paste, alter, background, foreground, zoom, undo, font.	- Improve an image by rotating it - Explain why I might crop an image - Use photo editing software to crop an image - Understand that editing images can be unethical - Explain that different colour effects make you think and feel different things - Experiment with different colour effects - Explain why I chose certain colour effects - Add to the composition of an image by cloning - Identify how a photo edit can be improved - Remove parts of an image using cloning - Experiment with tools to select and copy part of an image - Use a range of tools to copy between images - Explain why photos might be edited - Describe the image I want to create - Choose suitable images for my project - Create a project that is a combination of other images - Review images against a given criteria	Moon Camp- Pupils can explore and design their own settlement in the solar system with a 3D modelling tool.

	<u>Education for a Connected World links</u> Self-image and identity explain how my online identity can be different to my offline identity					- Use feedback to guide making changes - Combine text and my image to complete the project	
<u>Programming B – Repetition in games</u>	<u>Computing</u> - Design, write, and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts - Use sequence, selection, and repetition in programs; work with variables and various forms of input and output - Use logical reasoning to explain how some simple algorithms work, and to detect and correct errors in algorithms and programs - Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information	Y1- Programming animations Y2- Programming quizzes Y3- Events and actions in programs	Can the class: - Develop the use of count-controlled loops in a different programming environment - Explain that in programming there are infinite loops and count-controlled loops - Develop a design that includes two or more loops which run at the same time - Modify an infinite loop in a given program - Design a project that includes repetition - Create a project that includes repetition	Y5- Selection in quizzes Y6- Sensing movement	Scratch, programming, sprite, blocks, code, loop, repeat, value, infinite loop, count-controlled loop, costume, repetition, forever, animate, event block, duplicate, modify, design, algorithm, debug, refine, evaluate	- List an everyday task as a set of instructions including repetition - Predict the outcome of a snippet of code - Modify a snippet of code to create a given outcome - Modify loops to produce a given outcome - Choose when to use a count-controlled and an infinite loop - Recognise that some programming languages enable more than one process to be run at once - Choose which action will be repeated for each object - Explain what the outcome of the repeated action should be - Evaluate the effectiveness of the repeated sequences used in my program - Identify which parts of a loop can be changed - Explain the effect of my changes - Re-use existing code snippets on new sprites - Evaluate the use of repetition in a project - Select key parts of a given project to use in my own design - Develop my own design explaining what my project will do - Refine the algorithm in my design - Build a program that follows my design - Evaluate the steps I followed when building my project	Code Club Code Club is a network of free coding clubs where KS2 pupils can learn to create games, animations and websites It is provided to teachers with all the tools to set it up, with no previous coding experience needed..

Year 5

Topic	Links to National Curriculum	Prior learning	Key Questions	Looking forward	Vocabulary	Concepts	Enrichment and engagement opportunities
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<u>Computing systems and networks - systems and searching</u>	- Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration - explain the benefits and limitations of using different types of search technologies e.g. voice-activation search engine. explain how some technology can limit the information I am presented with. - explain what a strong password is and demonstrate how to create one - Pupils should know how to be a discerning consumer of information online, including that from search engines, is ranked, selected and targeted	Y1- Technology around us Y2- IT Around us Y3- Connecting Computers Y4- The Internet	Can the class: - Explain that computers can be connected together to form systems - Recognise the role of computer systems in our lives - Identify how to use a search engine - Describe how search engines select results - Explain how search results are ranked - Recognise why the order of results is important, and to whom	Y6- Communication & Collaboration	system, connection, digital, input, process, storage, output, search, search engine, refine, index, bot, ordering, links, algorithm, search engine optimisation (SEO), web crawler, content creator, selection, ranking.	- Explain that systems are built using a number of parts - Describe the input, process, and output of a digital system - Explain that computer systems communicate with other devices - Identify tasks that are managed by computer systems - Identify the human elements of a computer system - Explain the benefits of a given computer system - Explain how to keep my personal information safe online - Make use of a web search to find specific information - Refine my web search - Compare results from different search engines - Recognise trustworthy websites - Explain why we need tools to find things online - Recognise the role of web crawlers in creating an index - Relate a search term to the search engine's index - Order a list by rank - Explain that a search engine follows rules to rank results - Give examples of criteria used by search engines to rank results - Describe some of the ways that search results can be influenced - Recognise some of the limitations of search engines - Explain how search engines make money	Arm School Program A project-based learning activity combined with physical computing. Offers innovation with skills & knowledge.
<u>Creating media - Video production</u>	Computing - Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content - Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting,	Y1- Digital Painting Y1- Digital Writing Y2- Digital Photography Y2- Digital Music	Can the class: - Explain what makes a video effective - Use a digital device to record video - Capture video using a range of techniques - Create a storyboard - Identify that video can be improved through reshooting and editing - Consider the impact of the choices made when making and sharing a video	Y5- Introduction to vector graphics Y6- Web page creation Y6- 3D Modelling	video, audio, camera, talking head, panning, close up, video camera, microphone, lens, mid-range, long shot, moving subject, side by side, angle (high, low, normal), static, zoom, pan, tilt, storyboard, filming, review, import,	- Explain that video is a visual media format - Identify features of videos - Compare features in different videos - Know what to do if any content online is seen that makes them uncomfortable - Identify and find features on a digital video recording device - Experiment with different camera angles - Make use of a microphone - Suggest filming techniques for a given purpose - Capture video using a range of filming techniques - Review how effective my video is - Outline the scenes of my video - Decide which filming techniques I will use	Moon Camp- Pupils can explore and design their own settlement in the solar system with a 3D modelling tool.

	analysing, evaluating, and presenting data and information - Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact <u>Education for a Connected World links</u> Online relationships - explain how someone can get help if they are having problems and identify when to tell a trusted adult.	Y3- Stop Frame Animation Y3- Desktop publishing Y4- Audio production Y5- Photo editing			split, trim, clip, edit, reshoot, delete, reorder, export, evaluate, share	- Create and save video content - Store, retrieve, and export my recording to a computer - Explain how to improve a video by reshooting and editing - Select the correct tools to make edits to my video - Make edits to my video and improve the final outcome - Recognise that my choices when making a video will impact the quality of the final outcome - Evaluate my video and share my opinions	
<u>Programming A – Selection in physical computing</u>	<u>Computing</u> - Design, write, and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts - Use sequence, selection, and repetition in programs; work with variables and various forms of input and output - Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs - Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information <u>Science – Electricity (Year 4)</u> - Construct a simple series electrical circuit, identifying and naming its	Y1- Moving a robot Y2- Robot algorithms Y3- Sequencing sounds Y4- Repetition in shapes	Can the class: - Control a simple circuit connected to a computer - Write a program that includes count-controlled loops - Explain that a loop can stop when a condition is met - Explain that a loop can be used to repeatedly check whether a condition has been met - Design a physical project that includes selection - Create a program that controls a physical computing project	Y6- Variables in games	microcontroller, USB, components, connection, infinite loop, output component, motor, repetition, count-controlled loop, Crumble controller, switch, LED, Sparkle, crocodile clips, connect, battery box, program, condition, Input, output, selection, action, debug, circuit, power, cell, buzzer	- Create a simple circuit and connect it to a microcontroller - Program a microcontroller to make an LED switch on - Explain what an infinite loop does - Connect more than one output component to a microcontroller - Use a count-controlled loop to control outputs - Design sequences that use count-controlled loops - Explain that a condition is either true or false - Design a conditional loop - Program a microcontroller to respond to an input - Explain that a condition being met can start an action - Identify a condition and an action in my project - Use selection (an ‘if...then...’ statement) to direct the flow of a program - Identify a real-world example of a condition starting an action - Describe what my project will do - Create a detailed drawing of my project - Write an algorithm that describes what my model will do - Use selection to produce an intended outcome - Test and debug my project	Moon Camp- Pupils can explore and design their own settlement in the solar system with a 3D modelling tool.

	basic parts, including cells, wires, bulbs, switches, and buzzers <u>Design and Technology (Key stage 2)</u> Design ● Generate, develop, model, and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces, and computer-aided design Make ● Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining, and finishing], accurately ● Select from and use a wider range of materials and components, including construction materials, textiles, and ingredients, according to their functional properties and aesthetic qualities Evaluate ● Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work Technical knowledge ● Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers, and motors] ● Apply their understanding of computing to program, monitor, and control their products						
<u>Data and information – Flat-file databases</u>	<u>Computing</u> ● Use search technologies effectively, appreciate how results are selected and ranked, and be	Y1- Grouping data Y2- Pictograms	Can the class: - Use a form to record information - Compare paper and computer-based databases - Outline how you can answer questions by grouping and then sorting data	Y6- Introduction to spreadsheets	database, data, information, record, field, sort, order, group, search, value, criteria, graph, chart, axis,	● Create a database using cards ● Explain how information can be recorded ● Order, sort, and group my data cards ● Explain what a field and a record is in a database ● Navigate a flat-file database to compare different views of information	Arm School Program A project-based learning activity combined with physical

	discerning in evaluating digital content - Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information Maths – Statistics (Year 5) - complete, read and interpret information in tables, including timetables.	Y3- Branching databases Y4- Data logging	- Explain that tools can be used to select specific data - Explain that computer programs can be used to compare data visually - Use a real-world database to answer questions		compare, filter, presentation.	- Choose which field to sort data by to answer a given question - Explain that data can be grouped using chosen values - Group information using a database - Combine grouping and sorting to answer specific questions - Choose which field and value are required to answer a given question - Outline how ‘AND’ and ‘OR’ can be used to refine data selection - Choose multiple criteria to answer a given question - Select an appropriate chart to visually compare data - Refine a chart by selecting a particular filter - Explain the benefits of using a computer to create charts - Ask questions that will need more than one field to answer - Refine a search in a real-world context - Present my findings to a group	computing. Offers innovation with skills & knowledge.
<u>Creating media - Introduction to vector graphics</u>	Computing - Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information. Art and Design - to improve their mastery of art and design techniques, including drawing, painting and sculpture with a range of materials [for example, pencil, charcoal, paint, clay]	Y1- Digital Painting Y1- Digital Writing Y2- Digital Photography Y2- Digital Music Y3- Stop Frame Animation Y3- Desktop publishing Y4- Audio production Y5- Photo editing Y5- Video production	Can the class: - Identify that drawing tools can be used to produce different outcomes - Create a vector drawing by combining shapes - Use tools to achieve a desired effect - Recognise that vector drawings consist of layers - Recognise that vector drawings consist of layers - Apply what they have learned about vector drawings	Y6- Web page creation Y6- 3D Modelling	vector, drawing tools, object, toolbar, vector drawing, move, resize, colour, rotate, duplicate/copy, zoom, select, align, modify, layers, order, copy, paste, group, ungroup, reuse, reflection	- Recognise that vector drawings are made using shapes - Experiment with the shape and line tools - Discuss how vector drawings are different from paper-based drawings - Identify the shapes used to make a vector drawing - Explain that each element added to a vector drawing is an object - Move, resize, and rotate objects I have duplicated - Use the zoom tool to help me add detail to my drawings - Explain how alignment grids and resize handles can be used to improve consistency - Modify objects to create a new image - Identify that each added object creates a new layer in the drawing - Change the order of layers in a vector drawing - Use layering to create an image - Copy part of a drawing by duplicating several objects - Recognise when I need to group and ungroup objects - Reuse a group of objects to further develop my vector drawing - Create a vector drawing for a specific purpose - Reflect on the skills I have used and why I have used them	Moon Camp- Pupils can explore and design their own settlement in the solar system with a 3D modelling tool.

						Compare vector drawings to freehand paint drawings	
<u>Programming B – Selection in quizzes</u>	<u>Computing</u> - design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts - use sequence, selection, and repetition in programs; work with variables and various forms of input and output - use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs - select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information	Y1- Programming animations Y2- Programming quizzes Y3- Events and actions in programs Y4- Repetition in games	Can the class: - Explain how selection is used in computer programs - Relate that a conditional statement connects a condition to an outcome - Explain how selection directs the flow of a program - Design a program that uses selection - Create a program that uses selection - Evaluate a program	Y6- Sensing movement	Selection, condition, true, false, count-controlled loop, outcomes, conditional statement, algorithm, program, debug, question, answer, task, design, input, implement, test, run, setup, operator	- Recall how conditions are used in selection - Identify conditions in a program - Modify a condition in a program - Use selection in an infinite loop to check a condition - Identify the condition and outcomes in an ‘if... then... else...’ statement - Create a program that uses selection to produce different outcomes - Explain that program flow can branch according to a condition - Design the flow of a program that contains ‘if... then... else...’ - Show that a condition can direct program flow in one of two ways - Outline a given task - Use a design format to outline my project - Identify the outcome of user input in an algorithm - Implement my algorithm to create the first section of my program - Test my program - Share my program with others - Identify ways the program could be improved - Identify the setup code I need in my program - Extend my program further	Arm School Program A project-based learning activity combined with physical computing. Offers innovation with skills & knowledge.

Year 6

Topic	Links to National Curriculum	Prior learning	Key Questions	Looking forward	Vocabulary	Concepts	Enrichment and engagement opportunities
<u>Computing systems and networks - Communication and collaboration</u>	<u>Computing</u> - Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration - Select, use and combine a variety of software (including internet services) on a range of digital	Y1- Technology around us Y2- IT Around us Y3- Connecting Computers	Can the class: - Explain the importance of internet addresses - Recognise how data is transferred across the internet - Explain how sharing information online can help people to work together - Evaluate different ways of working together online - Recognise how we communicate using technology	Y7- Networks from semaphores to the internet	communicatio n, protocol, data, address, Internet Protocol (IP), Domain Name Server (DNS), packet, header, data payload, chat, explore, slide deck, reuse,	- Recognise that data is transferred using agreed methods - Explain that internet devices have addresses - Describe how computers use addresses to access websites - Identify and explain the main parts of a data packet - Explain that data is transferred over networks in packets - Explain that all data transferred over the internet is in packets	Arm School Program A project-based learning activity combined with physical computing. Offers innovation with skills & knowledge.

	devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information ● Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact <u>Education for a Connected World links</u> Managing Online Information ● identify, flag and report inappropriate content Self-image and identity ● describe issues online that could make anyone feel sad, worried, uncomfortable or frightened. I know and can give examples of how to get help, both on and offline <u>Relationships Education, Relationships and Sex Education (RSE) and Health Education</u> Online relationships ● Pupils should know how information and data is shared and used online Internet safety and Harms ⌘ Pupils should know that for most people the internet is an integral part of life and has many benefits ⌘ Pupils should know where and how to report concerns and get support with issues online	Y4- The Internet Y5- Systems and Searching	- Evaluate different methods of online communication		remix, collaboration, internet, public, private, oneway, two-way, one-to-one, one-to-many	● Recognise how to access shared files stored online ● Send information over the internet in different ways ● Explain that the internet allows different media to be shared ● Identify different ways of working together online ● Recognise that working together on the internet can be public or private ● Explain how the internet enables effective collaboration ● Explain the different ways in which people communicate ● Identify that there are a variety of ways to communicate over the internet ● Choose methods of communication to suit particular purposes ● Compare different methods of communicating on the internet ● Decide when I should and should not share information online ● Explain that communication on the internet may not be private ● Explain how to report inappropriate content online	
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<u>Creating media – Web page creation</u>	<u>Computing</u> - Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content - Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information. - use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour. <u>Education for a Connected World links</u> Copyright and ownership - demonstrate the use of search tools to find and access online content which can be reused by others. <u>English</u> - Writing composition: Identifying the audience for and purpose of the writing, selecting the appropriate form, and using other similar writing as models for their own.	Y1- Digital Painting Y1- Digital Writing Y2- Digital Photography Y2- Digital Music Y3- Stop Frame Animation Y3- Desktop publishing Y4- Audio production Y5- Photo editing Y5- Video production Y5- Introduction to vector graphics	Can the class: - Review an existing website and consider its structure - Plan the features of a web page - Consider the ownership and use of images (copyright) - Recognise the need to preview pages - Outline the need for a navigation path - Recognise the implications of linking to content owned by other people	Y6- 3D Modelling Y7- Clear messaging in digital media	website, web page, browser, media, Hypertext Markup Language (HTML), logo, layout, header, media, purpose, copyright, fair use, home page, preview, evaluate, device, Google Sites, breadcrumb trail, navigation, hyperlink, subpage, evaluate, implication, external link, embed.	- Explore a website - Discuss the different types of media used on websites - Know that websites are written in HTML - Recognise the common features of a web page - Suggest media to include on my page - Draw a web page layout that suits my purpose - Say why I should use copyright-free images - Find copyright-free images - Describe what is meant by the term ‘fair use’ - Know how to use technology respectfully and responsibly when online - Add content to my own web page - Preview what my web page looks like - Evaluate what my web page looks like on different devices and suggest/make edits. - Explain what a navigation path is - Describe why navigation paths are useful - Make multiple web pages and link them using hyperlinks - Explain the implication of linking to content owned by others - Create hyperlinks to link to other people's work - Evaluate the user experience of a website	Moon Camp- Pupils can explore and design their own settlement in the solar system with a 3D modelling tool.
<u>Programming A – Variables in games</u>	<u>Computing</u> Design, write and debug programs that accomplish specific goals, including controlling or simulating physical	Y1- Moving a robot Y2- Robot algorithms	Can the class: - Define a ‘variable’ as something that is changeable - Explain why a variable is used in a program	Y7- Micro:bit & Make code environme	variable, change, name, value, set, design, event, algorithm,	- Identify examples of information that is variable - Explain that the way a variable changes can be defined - Identify that variables can hold numbers or letters	Code Club Code Club is a network of free coding clubs where KS2 pupils

	systems; solve problems by decomposing them into smaller parts • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information	Y3- Sequencing sounds Y4- Repetition in shapes Y5- Selection in physical computing	- Choose how to improve a game by using variables - Design a project that builds on a given example - Use their design to create a project - Evaluate a project	wnt transition	code, task, artwork, program, project, code, test, debug, improve, evaluate, share, assign, declare	• Identify a program variable as a placeholder in memory for a single value • Explain that a variable has a name and a value • Recognise that the value of a variable can be changed • Decide where in a program to change a variable • Make use of an event in a program to set a variable • Recognise that the value of a variable can be used by a program • Choose the artwork for a project • Create algorithms for a project • Explain design choices • Create the artwork for a project • Choose a name that identifies the role of a variable • Test the code that has been written • Identify ways that a game could be improved • Use variables to extend a game • Share a game with others	can learn to create games, animations and websites It is provided to teachers with all the tools to set it up, with no previous coding experience needed..
<u>Data and information - Introduction to Spreadsheets</u>	Computing • Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information Maths Number • Solve problems involving addition, subtraction, multiplication, and division Statistics: • Interpret and construct pie charts and line graphs, and use these to solve problems	Y1- Grouping data Y2- Pictograms Y3- Branching databases Y4- Data logging Y5- Flat-file databases	Can the class: - Create a data set in a spreadsheet - Build a data set in a spreadsheet - Explain that formulas can be used to produce calculated data - Apply formulas to data - Create a spreadsheet to plan an event - Choose suitable ways to present data	Y7- Modelling data using spreadsheets	data, collecting, table, structure, spreadsheet, cell, cell reference, data item, format, formula, calculation, spreadsheet, input, output, operation, range, duplicate, sigma, propose, question, data set, organised, chart, evaluate, results, sum, comparison, software, tools.	• Collect data • suggest how to structure data • Enter data into a spreadsheet • Explain what an item of data is • Choose an appropriate format for a cell • Apply an appropriate format to a cell • Explain which data types can be used in calculations • Construct a formula in a spreadsheet • Identify that changing inputs changes outputs • Calculate data using different operations • Create a formula which includes a range of cells • Apply a formula to multiple cells by duplicating it • Use a spreadsheet to answer questions • Explain why data should be organised • Apply a formula to calculate the data needed to answer questions • Produce a chart • Use a chart to show the answer to a question • Suggest when to use a table or chart	Arm School Program A project-based learning activity combined with physical computing. Offers innovation with skills & knowledge.

	- Calculate and interpret the mean as an average <u>Education for a Connected World links</u> Managing information online - describe how to search for information within a wide group of technologies (e.g. social media, image sites, video sites) - use different search technologies - evaluate digital content and can explain how I make choices from search results						
<u>Creating media – 3D Modelling</u>	<u>Computing</u> - Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information - Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact <u>Education for a Connected World links</u> Privacy and Security - describe strategies for keeping my personal information private, depending on context	Y1- Digital Painting Y1- Digital Writing Y2- Digital Photography Y2- Digital Music Y3- Stop Frame Animation Y3- Desktop publishing Y4- Audio production Y5- Photo editing Y5- Video production Y5- Introduction to vector graphics Y6- Web page creation	Can the class: - Recognise that you can work in three dimensions on a computer - Identify that digital 3D objects can be modified - Recognise that objects can be combined in a 3D model - Create a 3D model for a given purpose - Plan their own 3D model - Create their own digital 3D model	Y7- Using media to gain support for a cause	TinkerCAD, 2D, 3D, shapes, select, move, perspective, view, handles, resize, lift, lower, recolour, rotate, duplicate, group, cylinder, cube, cuboid, sphere, cone, prism, pyramid, placeholder, hollow, choose, combine, construct, evaluate, modify	- Add 3D shapes to a project - View 3D shapes from different perspectives - Move 3D shapes relative to one another - Resize an object in three dimensions - Lift/lower 3D objects - Recolour a 3D object - Rotate objects in three dimensions - Duplicate 3D objects - Group 3D objects - Accurately size 3D objects - Show that placeholders can create holes in 3D objects - Combine a number of 3D objects - Analyse a 3D model - Choose objects to use in a 3D model - Combine objects in a design - Construct a 3D model based on a design - Explain how a 3D model could be improve - Modify a 3D model to improve it	Moon Camp- Pupils can explore and design their own settlement in the solar system with a 3D modelling tool.

	<u>Art and Design</u> • To improve their mastery of art and design techniques, including drawing, painting, and sculpture with a range of materials <u>Design and Technology</u> • Generate, develop, model, and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design <u>Maths</u> Recognise, describe, and build simple 3D shapes, including making nets						
<u>Programming B - Sensing movement</u>	<u>National curriculum links</u> • Design, write, and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information	Y1- Programming animations Y2- Programming quizzes Y3- Events and actions in programs Y4- Repetition in games Y5- Selection in quizzes	- Create a program to run on a controllable device - Explain that selection can control the flow of a program - Update a variable with a user input - Use a conditional statement to compare a variable to a value - Design a project that uses inputs and outputs on a controllable device - Develop a program to use inputs and outputs on a controllable device	Programmin g essentials in Scratch: II	Micro:bit, MakeCode, input, process, output, flashing, USB, trace, selection, condition, if then else, variable, random, sensing, accelerometer, value, compass, direction, navigation, design, task, algorithm, step counter, plan, create, code, test, debug.	• Apply knowledge of programming to a new environment • Test a program on an emulator • Transfer a program to a controllable device • Identify examples of conditions in the real world • Use a variable in an if, then, else statement to select the flow of a program • Determine the flow of a program using selection • Use a condition to change a variable • Experiment with different physical inputs • Explain that checking a variable doesn't change its value • Use an operand (e.g. <>=) in an if, then statement • Explain the importance of the order of conditions in else, if statements • Modify a program to achieve a different outcome and decide what variables to include in a project • Design the algorithm for a project • Design the program flow for a project • Create a program based on a design • Test a program against a design • Use a range of approaches to find and fix bugs	Code Club Code Club is a network of free coding clubs where KS2 pupils can learn to create games, animations and websites It is provided to teachers with all the tools to set it up, with no previous coding experience needed.

