COMPUTING – Long Term Plan and Progression Document

Vision

At Eccleston Lane Ends, our vision is for each and every child to be able to confidently access the ever-changing, technological world around us. Our curriculum offer ensures that children are being exposed to technology from a young age and learning key skills in each year group- this will ensure that they will be able to actively participate in our rapidly changing world.

Intent

At Eccleston Lane Ends our intent for the Computing element of our school curriculum is to provide a high-quality computing education which equips children to use computational thinking and creativity to understand and change the world through digital means. We recognise that our pupils lives, both vocationally and socially, will increasingly take place within a digital medium and therefore, this subject is seen as vital in developing a broad range of skills that will enable not only digital competence but also ensure an understanding of how to be a responsible online citizen; our curriculum therefore places equal emphasis on teaching 'Online Safety'.

Implementation

At Eccleston Lane Ends, computing is taught using a blocked curriculum approach. This ensured children are able to develop depth in their knowledge and skills over duration of each of their computing topics. Teachers often richly link their computing curriculum to engaging topics and subjects. Knowledge and skills are mapped across each topic and year group to ensure systematic progression. The implementation of the curriculum also ensures a balanced coverage of computing systems and networks, creating media, programming and data and information. The children will experience all four strands in each year group, but the subject knowledge imparted becomes increasingly specific and in depth, with more complex skills being taught, thus ensuring that learning is built upon. For example, children in Key Stage 1 learn what algorithms are, which leads them to the design stage of programming in Key Stage 2, where they design and debug programs, explaining their thinking behind their algorithms.

Impact

The impact of our curriculum is that by the end of each year, the vast majority of pupils have sustained mastery of the content, that is, they remember it all and are fluent in it as well as some pupils having a greater depth of understanding. We track carefully to ensure pupils are on track to reach expectations of our curriculum.

The impact measure of achieving our school aims in the widest sense is very important. By ensuring that pupils develop effectively into well-rounded individuals who embody our values, have a thirst for learning and are well-prepared for the next stage of their education. In turn, they become valuable future citizens as the desired impact and a result of an outstanding educational offer at Eccleston Lane Ends.

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	Autumn 1 Computing systems and networks	Autumn 2 Creating media	Spring 1 Programming	Spring 2 Data and information	Summer 1 Creating media	Summer 2 Programming
EYFS	Using a smartboard – Drag and drop skills	Using a digital camera / iPad cameras Using an iPad for age appropriate games Using Bee Bots	Using paint packages on a P.C.– Mouse skills	Using a digital camera / IPad cameras Using an IPad for age appropriate games Using Bee Bots	Using a listening station Accessing interactive books Using an IPad for age appropriate games	Using paint packages on a P.C. – Mouse skills Logging in to a P.C.
Year 1	Technology around us	Creating Media – Digital Writing	Moving a robot	Grouping Data	Digital Painting	Introduction to Animation
Year 2	IT around us	Making Music	Robot algorithms	Pictograms	Digital Photography	An introduction to quizzes
Year 3	Connecting Computers	Desktop Publishing	Sequence in music	Branching Databases	Animation	Events and actions
Year 4	The internet	Photo Editing	Repetition in shapes	Data Logging	Audio Editing	Repetition in games
Year 5	Sharing Information	Video Editing	Selection in physical computing	Flat-file databases	Vector drawing	Selection in quizzes
Year 6	Communication	Web Page Creation	Variables in games	Spreadsheets	3D Modelling	Sensing

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Strands/concepts/big Ideas for your subject area	COMPUTING SYSTEMS AND NETWORKS	CREATING MEDIA	PROGRAMMING	DATA AND INFORMATION
EYFS				
EYFS end points **Understanding the world** **Personal, social and emotional development** **Expressive arts and design**	I can use a safe part of the Internet to play and learn. I can operate simple equipment. I can tell you about technology that is used at home and in school.	I can use technology to show my learning. I can move objects on a screen. I can create shapes and text on a screen.	I can use simple software to make something happen. I can make a floor robot move. I can make choices about the buttons and icons I press, touch or click on.	I can tell you about different kinds of information such as pictures, video, text and sound.
KS1				
KS1 end points	Recognise common uses of information technology beyond school	Use technology purposefully to create, organise, store, manipulate and retrieve digital content	Understand what algorithms are Understand how algorithms are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions Create and debug simple programs	Identify an object by asking yes/no questions. Recognise charts, pictograms and tables, understand that they contain information and be able to explain the information with growing independence. Collect data on a topic and present this information in simple charts.
Year 1				
Year 1 end points	Recognising technology in school and using it responsibly	Choosing appropriate tools in a program to create art, and making comparisons with working non-digitally.	Writing short algorithms and programs for floor robots, and predicting program outcomes.	Exploring object labels, then using them to sort and group objects by properties.

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		Using a computer to create and format text, before comparing to writing non-digitally.	Designing and programming the movement of a character on screen to tell stories.	
Skills to be taught	Logging in to the computer, finding the paint app Using the trackpad to click, drag and drop Use a mouse in different ways	Identify and find keys on a keyboard. Create/edit a drawing using a range of 'tools' such as brushes, pens, eraser, stamps and shapes, and set the size, colour and shape. Add and remove text using basic typing skills (including use of space bar, backspace to delete and basic, age - appropriate punctuation).	Combine forwards and backwards commands to make a sequence Combine four direction commands to make sequences Give a sequence of instructions to a floor robot. The length of programs increasing over the course of the year Begin to debug instructions when floor robot does not reach the intended destination	Count objects with same properties Compare groups of objects Label objects
Knowledge to be taught	Identify a computer and its main parts Identify technology	Explain why tools were chosen and used	Begin to understand an algorithm is a set of instructions to achieve a specific purpose Understand that we control computers by giving them instructions Show a series of commands can be joined together	Describe objects in different ways Identify that objects can be counted

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			Begin to predict what will happen for a short sequence of instructions in a program Understand that the order of instructions in an algorithm is important Understand that we control computers by giving them instructions	
Vocabulary	Computer, screen, monitor, mouse, trackpad, responsibly, drag, click, safely, keyboard, space bar, technology	Paint app, tool, line tool, erase, brush tool, shape tool, undo, fill, primary colours, pointillism, word processor, font, keys, backspace, select, text, italic, shift, cursor, toolbar, underline, bold	Bee-bot, forwards, backwards, turn, clear, go, command, instructions, directions, plan, algorithm, route, sprite, compare, programming area, block, joining, start block, run, background, delete, reset, predict, effect, change, value, instructions, design	The same, object, label, group, search, image, properties, colour, size, shape, value, data, more/less, most/fewest/least
Year 2				
Year 2 end points	Identifying IT and how its responsible use improves our world in school and beyond.	Capturing and changing digital photographs for different purposes. Using a computer as a tool to explore rhythms and melodies, before creating a musical composition.	Creating and debugging programs, and using logical reasoning to make predictions. Designing algorithms and programs that use events to trigger sequences of code to make an interactive quiz.	Collecting data in tally charts and using attributes to organise and present data on a computer.
Skills to be taught	Continue to practise mouse skills independently	Identify and find keys on a keyboard with increased confidence and speed	Combine four directions commands to make	Select objects by attribute and make comparisons

	Identify information technology in the home Identify information technology beyond school	Type capital letters Change font, style (bold, italic and underline) and size of text Save, print, retrieve and edit work from appropriate location (hard drive and Google Drive) independently Add and resize images (including insert clip art/copy & paste an image) Capture/edit photograph using a range of 'tools'	increasingly more complex sequences Create a simple program on screen, correcting any errors, with a particular goal or purpose in mind (e.g. drawing a shape or moving a sprite from one place to another). Use the word debug to correct mistakes in an algorithm Predict the outcome of a sequence	Create a pictogram
Knowledge to be taught	Recognise the uses and features of information technology Explain how information technology benefits us	Use software to create and edit digital music for a purpose Explain and begin to justify why tools were chosen and used	Describe a series of instructions as a sequence Explain that a sequence of commands has an outcome Understand that computers have no intelligence and we have to program them to do things Explain that a sequence of commands has a start	Recognise that objects can be counted and compared using tally charts Recognise objects can be represented as pictures Explain that information can be presented using a computer

| | | | Explain what happens when we change the order of commands

Understand that instructions in an algorithm need to be in order, clear and unambiguous Compare prediction to the program outcome | |
|---|---|---|---|---|
| Vocabulary | Information technology, computer, barcode, scan | Device, capture, image, digital, landscape, portrait, field of view, narrow, wide, format, framing, focal point, subject matter, compose, natura/artificial lighting, flash, focus, background/foreground, editing, tools, filter, changed, real, music, quiet, loud, pattern, rhythm, pulse/beat, pitch, tempo, create, edit | Start, outcome, predict, blocks, actions, change, build, match, compare, evaluate, instruction, sequence, clear, order, commands, prediction, design, route, debugging | Organise, tally chart, votes, total, pictogram, enter, compare, count, explain, attribute, difference, most/least popular, conclusion, block diagram |
| **KS2** | | | | |
| KS2 end points | 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 | 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 | Collecting, analysing, evaluating and presenting data and information

Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content |

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			Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs	
Year 3				
Year 3 end points	Identifying that digital devices have inputs, processes, and outputs, and how devices can be connected to make networks.	Capturing and editing digital still images to produce a stop-frame animation that tells a story. Creating documents by modifying text, images, and page layouts for a specified purpose.	Creating sequences in a block-based programming language to make music. Writing algorithms and programs that use a range of events to trigger sequences of actions.	Building and using branching databases to group objects using yes/no questions.
Skills to be taught	Explore how digital devices can be connected Recognise the physical components of a network Identify input and output devices	Combine text and images to share a message Type with increased confidence and speed using ageappropriate punctuation Use return to create paragraphs Change orientation of text Wrap text around an image	Create a sequence of commands using a block language to produce a given outcome Debug errors to accomplish specific goal Work with others to decompose a problem into smaller steps in planning a project	Search for information in a single site Create a branching database Compare information shown in a pictogram with a branching database

		Change orientation of images Plan an animation Review and improve an animation	Use logical reasoning to detect errors in programs	
Knowledge to be taught	Explain how digital devices function Explain how a computer network can be used to share information	Consider how different layouts can suit different purposes Recognise a document can be formatted with placeholders Understand animation is a sequence of drawings or photographs Relate animated movement with a sequence of images Evaluate the impact of adding other media to an animation	Explain the order (sequence) of commands can effect the outcome (same commands, different order -> same or different outcome) Identify different sequences can achieve the same outcome Explain simple, sequence - based algorithm independently	Identify object attributes needed to collect relevant data Identify objects using a branching database Explain that data can be used to answer questions Understand that search engines select pages according to keywords found in the content
Vocabulary	Digital device, input, output, process, program, connection, network	Animation, flip book, stop-frame animation, frame, sequence, image, photograph, setting, character, events, onion skinning, media, import, transition, desktop publishing, text, images, font style, template, orientation, placeholder, copy, paste, layout, purpose	Programming, scratch, blocks, code, sprite, costume, stage, backdrop, motion, point in direction, go to, event, task, run the code, order, note, chord, bug, motion, event, logic, move, resize, extension block, pen, action, errors, test	Attribute, value, questions, table, objects, branching database, equal, even, separate, structure, compare, order, organise, selecting, information, decision tree

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Year 4				
Year 4 end points	Recognising the internet as a network of networks including the WWW, and why we should evaluate online content.	Capturing and editing audio to produce a podcast, ensuring that copyright is considered. Manipulating digital images, and reflecting on the impact of changes and whether the required purpose is fulfilled.	Using a text-based programming language to explore count-controlled loops when drawing shapes. Using a block-based programming language to explore count-controlled and infinite loops when creating a game.	Recognising how and why data is collected over time, before using data loggers to carry out an investigation.
Skills to be taught	Describe how networks physically connect to other networks Describe how content can be added and accessed on the World Wide Web Describe the current limitations of World Wide Web media	Use a computer to (further) manipulate images Use the most appropriate tool for a particular purpose Press/tap buttons to start and stop recordings Edit and alter recorded audio Layer sounds Save/export an audio file	Plan a program using a block language which includes appropriate loops to produce a given outcome Debug errors in increasingly complex programs to accomplish specific goal Independently decompose a problem into smaller steps in planning a project	Collect data using a digital device Use a larger data set to find information Use a computer program to sort data by one attribute Use a standard search engine to find information Export information and present data in a table and a graph
Knowledge to be taught	Recognise how networked devices make up the internet Recognise how the content of the WWW is created and shared by people	Recognise images can be changed for different purposes Consider the impact of changes made on the quality of the image Recognise recorded audio is stored as a file	Identify patterns (repetition) in a sequence Understand repetition in programming is also called looping Identify a loop in a program	Recognise that a sensor can be used as an input device for data collection Understand that search engines rank pages according to relevance

		Consider the results of editing choices made	Understand, identify and justify when to use 'infinite' or 'count - controlled' loops Explain the importance in instruction order in a loop Explain an algorithm using sequence and repetition independently Use logical reasoning to detect and correct errors in programs	
Vocabulary	World Wide Web, network, router, network, security, network switch, server, wireless access point (WAP), browser, content, links, files, download, sharing, ownership, permission, information	Audio, record, playback, input, output, sound, podcast, selection, mixing, time shift, export, sound file, arrange, digital, crop, undo, copyright, composition, pixels, rotate, flip, effects, hue/Saturation, sepia, illustrator, vignette, retouch, clone, recolour, sharpen, brighten, composite, cut, copy, paste, original, border, layer	Loop , repeat, value, forever, count-controlled loop, animate, event block, duplicate, modify, refine, commands, code snippet, pattern, repetition, repeat, value, trace. decompose, procedure	Input device, sensor, data logger, logging, data point, interval, analyse, data set, import, export, logged, collection, review, conclusion
Year 5				
Year 5 end points	Recognising IT systems around us and how they allow us to search the internet.	Planning, capturing, and editing video to produce a short film. Creating images in a drawing program by using layers and groups of objects.	Exploring conditions and selection using a programmable microcontroller.	Using a database to order data and create charts to answer questions.

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			Exploring selection in programming to design and code an interactive quiz.	
Skills to be taught	Recognise the role of computer systems in our lives Contribute to a shared project online	Add, remove, modify and combine objects to create graphical drawing on a computer Plan a video production using a story board Use a computer to make a video Recognise a video can be improved through editing	Plan a program which includes selection to produce a given outcome Debug errors in increasingly complex programs to accomplish specific goal Plan a solution to a problem using decomposition	Use a form to collect information Navigate a flat -file database Design a structure for a flat -file database Select an appropriate graph to visually compare data Use filters to make more effective use of a standard search engine
Knowledge to be taught	Explain how sharing information online lets people in different places work together Evaluate different ways of working together online Explain that computers can be connected together to form systems Recognise how information is transferred over the internet	Recognise an image is comprised of separate objects Recognise objects are layered Recognise that objects can be modified in groups Consider the impact of choices made Identify the features of a good video Consider the impact of changes made on the quality of the video	Define that conditional statements (selection) are used in computer programs Explain a loop can stop when a condition is met (number of times or event) Explain a that program flow can branch according to a condition Use a condition in an if…then… statement to produce a given outcome	Apply knowledge of a database to ask and answer real -world questions Choose tools to select and analyse data to answer questions Choose suitable ways to present information Understand that search engines use a cached copy of the crawled web to select and rank results

			Explain an algorithm using sequence, repetition and selection independently Use logical reasoning to detect errors in increasingly complex programs	
Vocabulary	Computer systems, shared information, online projects, system , connection, digital, input, process, output, protocol, address, chat, collaboration, IP address	Vector, drawing tools, icons, toolbar, vector drawing, move, resize, rotate, duplicate/copy, organise, zoom, select, alignment grid, handles, consistency, modify, layers, object, paste, group, ungroup, reuse, improvement, alternatives, video, audio, recording, storyboard, script, soundtrack, dialogue, capture, zoom, AV (Audio Visual), videographer, pan, tilt, angle, lighting, setting, export, split, trim/clip, titles, timeline, transitions, content, retake, special effects, title screen, end credits	Selection, condition, true, false, count-controlled loop, outcomes, conditional, statement, components, connect, infinite loop, output devices, motor, condition, input, action, selection	Database, record, field, sort, order, group, value, criteria, graph, chart, axis, compare, filter
Year 6				
Year 6 end points	Identifying and exploring how data is transferred and information is shared online.	Designing and creating webpages, giving consideration to copyright, aesthetics, and navigation. Planning, developing, and evaluating 3D computer models of physical objects.	Exploring variables when designing and coding a game. Designing and coding a project that captures inputs from a physical device.	Answering questions by using spreadsheets to organise and calculate data.

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Skills to be taught	Recognise the role of computer systems in our lives Contribute to a shared project online	Create a webpage including text, images, hyperlinks and embedded content Create 3D graphical objects on a computer Alter the view of a 3D space Modify 3D objects Combine 3D objects to create desired effect Apply blank 3D objects as placeholders to create holes	Plan a program which includes variables to produce a given outcome Debug errors in increasingly complex programs to accomplish specific goal Solve problems using decomposition, tackling each part separately	Create a spreadsheet for a purpose Evaluate results in comparison to the question asked Choose suitable ways to presents data Use of a range of search engines appropriate to finding information that is required
Knowledge to be taught	Explain how sharing information online lets people in different places work together Evaluate different ways of working together online Continue to develop online searching skills to enhance online communication and collaboration Explain that computers can be connected together to form systems Recognise how information is transferred over the internet	Recognise components of a webpage layout Understand the need for a navigation path	Define 'variable' as something that is changeable Explain that a variable has a name and a value Identify a variable in an existing program Use a variable in a conditional statement to control the flow of a program Clearly and concisely explain algorithms using sequence, repetition, selection and variables independently	Identify questions that can be answered using data Apply a formula that can be used to produce calculated data Recognise data can be calculated using different operations Understand that search engines rank pages based on the number and quality of inbound links

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Vocabulary	Search Engine, refine, index, web crawler, ranking, links, searching, selection, communication, public, private, SMS, blog, World Wide Web	Modelling, three-dimensional, workspace, faces, vertices, edges, handles, resize, position, hole, design, modify, web page, website, browser, media, hypertext markup language (HTML), logo, layout, header, purpose, copyright, home page, preview, navigation, subpage, external link, embed	Use logical reasoning to detect errors in increasingly complex programs
			Programming, if…then…else…variable, random, direction, navigation, motion sensor, input, output, motor, alarm, signal, variable, change, name, value, set, design, event, code, task, test, motion, callout	Spreadsheet, data heading, cells, data, columns and rows, data, format, common attribute, formula, calculation, cell reference, operation, range, graph, chart, evaluate, results, comparison

BRICKS Curriculum Links for Computing	**B:** Instil the British and school values – Linked Value **INCLUSION**

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- STEM afternoon – links to Computer Science and Technology which clearly demonstrates for the children the range of diverse figures who have careers across Science, Technology, Engineering and Maths. Our guest speakers are from our school community and local area who have careers in these areas.
- Our promotion of STEM careers raises the aspirations of our pupils, helps to broaden their horizons and exposes them to the myriad of careers they can pursue.
- Understanding that computing enables them to understand our rapidly changing world through the use of technology.
- Cross-curricular link with Black History – eg. Katherine Johnson (NASA)

R: Develop resilience and resourcefulness – Linked Value **DETERMINATION**
- Encountering new skills and persisting until they master it; this promotes optimism and determination.
- Using careful decision making and understanding how to most effectively carry out tasks.
- Our new curriculum is ensuring our students are digitally literate and competent users of technology.

I: Inspire critical thinking – Linked Value **HONESTY**
- Children are challenged to explore new skills each half term.
- Children are encouraged to embrace tasks independently as well as part of a team.

- We encourage our students to carefully consider the factual accuracy of information found online and what a reliable source of information is.

C: Create articulate learners – Linked Value **CO-OPERATION**
- Being able to rationalise their decision making when carrying out tasks or projects.
- Children are encouraged to verbally feedback what they are doing during Computing lessons to embed the skills they are learning and speak confidently about their learning in class.

K: Building upon knowledge and skills - Linked Value **RESPECT**
- All pupils understand and apply the fundamental principles and concepts of computing, including logic, algorithms, abstractions and data representation. They can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve these problems.
- All staff teach their lessons with confidence, ensuring that each pupil has sufficient knowledge to progress through their school life and beyond.

S: Supporting well-being and health – Linked Value **KINDESS**
- The e-safety curriculum is embedded closely within the Essence curriculum which is dedicated to physical health and mental wellbeing – there is a focus on this each half term.
- Children often reflect upon the impact that computing has on their learning and wellbeing. They are able to find a balance between their online and offline life and understand why this balance is essential.
- We promote the use of technology in school and how it can be useful in our everyday lives. However, we also make sure children know that the overuse of technology can have a negative impact and that the use of some technology needs to be limited.

Determination   Co-operation   Honesty   Inclusion   Kindness   Respect