Skills Progression Map **Subject – Computing**

Lawn Primary and Nursery School

Purpose of Computing:

A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that pupils become digitally literate – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world.

Aims of Computing:

- can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
- can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
- can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
- are responsible, competent, confident and creative users of information and communication technology.

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

EYFS new framework

Pupils aged 3 and 4 should be taught about:

- Remembering rules without needing an adult to remind them (personal, social and emotional development).
- Matching their developing physical skills to tasks and activities in the setting (physical development).
- Explore how things work (Understanding the world).

Pupils in reception should be taught about:

- Show resilience and perseverance in the face of a challenge (personal, social and emotional development).

- Know and talk about the different factors that support their overall health and wellbeing: sensible amounts of 'screen time' (personal, social and emotional development).
- Develop their small motor skills so that they can use a range of tools competently, safely and confidently (physical development).
- Explore, use and refine a variety of artistic effects to express their ideas and feelings (Expressive arts and design).

Early learning goals:

- Be confident to try new activities and show independence, resilience and perseverance in the face of challenge (personal, social and emotional development- managing self).
- Explain the reasons for rules, know right from wrong and try to behave accordingly (personal, social and emotional development- managing self).
- Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function (Expressive arts and design- creating with materials).

KS1 Knowledge

Pupils should be taught about:

understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions

- create and debug simple programs
- use logical reasoning to predict the behaviour of simple programs
- use technology purposefully to create, organise, store, manipulate and retrieve digital content
- recognise common uses of information technology beyond school
- use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.

KS2 Knowledge

Pupils should be taught about:

- design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

- understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration
- use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
- select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information
- use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

Teach computing Scheme

At Lawn we follow the Teach computing scheme, which has been created by the National Centre for Computing Education. The skills on this progression map have been taken from the units in this scheme.

Skill	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Computing systems and networks	I can follow rules when on devices, eg. Ipads/computers. I can explore how technology works. I can use a range of different technologies.	To identify technology To identify a computer and its main parts To use a mouse in different ways	To recognise the uses and features of information technology To identify the uses of information technology in the school	To explain how digital devices function To identify input and output devices To recognise how digital devices can change the way that we work	To describe how networks physically connect to other networks To recognise how networked devices make up the internet To outline how websites can be shared	To explain that computers can be connected together to form systems To recognise the role of computer systems in our lives To identify how to use a search engine	To explain the importance of internet addresses To recognise how data is transferred across the internet To explain how sharing information online can help

		To use a keyboard to type on a computer To use the keyboard to edit text To create rules for using technology responsibly	To identify information technology beyond school To explain how information technology helps us To explain how to use information technology safely To recognise that choices are made when using information technology	To explain how a computer network can be used to share information To explore how digital devices can be connected To recognise the physical components of a network	via the World Wide Web (WWW) To describe how content can be added and accessed on the World Wide Web (WWW) To recognise how the content of the WWW is created by people To evaluate the consequences of unreliable content	To describe how search engines select results To explain how search results are ranked To recognise why the order of results is important, and to whom	people to work together To evaluate different ways of working together online To recognise how we communicate using technology To evaluate different methods of online communication

Skill	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Creating media	I can explore, use and refine a variety of artistic effects to express my ideas and feels.	To describe what different freehand tools do To use the shape tool and the line tools	To use a digital device to take a photograph To make choices when taking a photograph	To explain that animation is a sequence of drawings or photographs To relate animated movement with a sequence of images	To identify that sound can be recorded To explain that audio recordings can be edited	To explain what makes a video effective To use a digital device to record video	To review an existing website and consider its structure

	I can safely use and explore a variety of artistic technologies, experimenting with colour, design, texture, form and function.	To make careful choices when painting a digital picture To explain why I chose the tools I used To use a computer on my own to paint a picture To compare painting a picture on a computer and on paper To use a computer to write To add and remove text on a computer To identify that the look of text can be changed on a computer To make careful choices when changing text To explain why I used the tools that I chose	To describe what makes a good photograph To decide how photographs can be improved To use tools to change an image To recognise that photos can be changed To say how music can make us feel To identify that there are patterns in music To experiment with sound using a computer To use a computer to create a musical pattern	To plan an animation To identify the need to work consistently and carefully To review and improve an animation To evaluate the impact of adding other media to an animation To recognise how text and images convey information To recognise that text and layout can be edited To choose appropriate page settings To add content to a desktop publishing publication To consider how different layouts can suit different purposes To consider the benefits of desktop publishing	To recognise the different parts of creating a podcast project To apply audio editing skills independently To combine audio to enhance my podcast project To evaluate the effective use of audio To explain that the composition of digital images can be changed To explain that colours can be changed in digital images To explain how cloning can be used in photo editing To explain that images can be combined To combine images for a purpose To evaluate how changes can improve an image	To capture video using a range of techniques To create a storyboard To identify that video can be improved through reshooting and editing To consider the impact of the choices made when making and sharing a video To identify that drawing tools can be used to produce different outcomes To create a vector drawing by combining shapes To use tools to achieve a desired effect	To plan the features of a web page To consider the ownership and use of images (copyright) To recognise the need to preview pages To outline the need for a navigation path To recognise the implications of linking to content owned by other people To recognise that you can work in three dimensions on a computer To identify that digital 3D objects can be modified

		To compare typing on a computer to writing on paper	To create music for a purpose To review and refine our computer work			To recognise that vector drawings consist of layers To group objects to make them easier to work with To apply what I have learned about vector drawings	To recognise that objects can be combined in a 3D model To create a 3D model for a given purpose To plan my own 3D model To create my own digital 3D model

Skill	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Programming	I can know and talk about the different factors which support my overall health and well-being. I know what a sensible amount of screen time is.	To explain what a given command will do To act out a given word To combine 'forwards' and 'backwards' commands to	To describe a series of instructions as a sequence To explain what happens when we change the order of instructions	To explore a new programming environment To identify that commands have an outcome To explain that a program has a start To recognise that a sequence of	To identify that accuracy in programming is important To create a program in a text-based language To explain what 'repeat' means	To control a simple circuit connected to a computer To write a program that includes count-controlled loops To explain that a loop can stop when a condition is met	To define a 'variable' as something that is changeable To explain why a variable is used in a program

		make a sequence To combine four direction commands to make sequences To plan a simple program To find more than one solution to a problem To choose a command for a given purpose To show that a series of commands can be joined together To identify the effect of changing a value	To use logical reasoning to predict the outcome of a program To explain that programming projects can have code and artwork To design an algorithm To create and debug a program that I have written To explain that a sequence of commands has a start To explain that a sequence of commands has an outcome	commands can have an order To change the appearance of my project To create a project from a task description To explain how a sprite moves in an existing project To create a program to move a sprite in four directions To adapt a program to a new context To develop my program by adding features To identify and fix bugs in a program To design and create a maze-based challenge	To modify a count-controlled loop to produce a given outcome To decompose a task into small steps To create a program that uses count-controlled loops to produce a given outcome To develop the use of count-controlled loops in a different programming environment To explain that in programming there are infinite loops and count-controlled loops To develop a design that includes two or more loops which run at the same time	To explain that a loop can be used to repeatedly check whether a condition has been met To design a physical project that includes selection To create a program that controls a physical computing project To explain how selection is used in computer programs To relate that a conditional statement connects a condition to an outcome To explain how selection directs the flow of a program	To choose how to improve a game by using variables To design a project that builds on a given example To use my design to create a project To evaluate my project To create a program to run on a controllable device To explain that selection can control the flow of a program To update a variable with a user input

		To explain that each sprite has its own instructions To design the parts of a project To use my algorithm to create a program	To create a program using a given design To change a given design To create a program using my own design To decide how my project can be improved		To modify an infinite loop in a given program To design a project that includes repetition To create a project that includes repetition	To design a program that uses selection To create a program that uses selection To evaluate my program	To use an conditional statement to compare a variable to a value To design a project that uses inputs and outputs on a controllable device To develop a program to use inputs and outputs on a controllable device

Skill	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6

Data and information	I can be confident to try new activities and show independence, resilience and perseverance in the face of challenge. I can explore how things work. I can develop my small motor skills so that I can use a range of tools competently, safely and confidently.	To label objects To identify that objects can be counted To describe objects in different ways To count objects with the same properties To compare groups of objects To answer questions about groups of objects	To recognise that we can count and compare objects using tally charts To recognise that objects can be represented as pictures To create a pictogram To select objects by attribute and make comparisons To recognise that people can be described by attributes To explain that we can present information using a computer	To create questions with yes/no answers To identify the attributes needed to collect data about an object To create a branching database To explain why it is helpful for a database to be well structured To plan the structure of a branching database To independently create an identification tool	To explain that data gathered over time can be used to answer questions To use a digital device to collect data automatically To explain that a data logger collects 'data points' from sensors over time To recognise how a computer can help us analyse data To identify the data needed to answer questions To use data from sensors to answer questions	To use a form to record information To compare paper and computer-based databases To outline how you can answer questions by grouping and then sorting data To explain that tools can be used to select specific data To explain that computer programs can be used to compare data visually To use a real-world database to answer questions	To create a data set in a spreadsheet To build a data set in a spreadsheet To explain that formulas can be used to produce calculated data To apply formulas to data To create a spreadsheet to plan an event To choose suitable ways to present data

Computing Curriculum Key Vocabulary

Skill Areas	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Computing systems and networks	On, off, ipad, computer.	technology, computer, mouse, trackpad, keyboard, screen, double-click, typing.	Information technology (IT), computer, barcode, scanner/scan	digital device, input, process, output, program, digital, non-digital, connection, network, switch, server, wireless access point, cables, sockets	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	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.	communication, protocol, data, address, Internet Protocol (IP), Domain Name Server (DNS), packet, header, data payload, chat, explore, slide deck, reuse, remix, collaboration, internet, public, private, oneway, two-way, one-to-one, one-to-many.

Creating media	Picture, photograph, camera, video, draw, paint.	paint program, tool, paintbrush, erase, fill, undo, shape tools, line tool, fill tool, undo tool, colour, brush style, brush size, pictures, painting, computers 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.	music, quiet, loud, feelings, emotions, pattern, rhythm, pulse, pitch, tempo, rhythm, notes, create, emotion, beat, instrument, open, edit. device, camera, photograph, capture, image, digital, landscape, portrait, framing, subject, compose, light sources, flash, focus, background, editing, filter, format, framing, lighting,	text, images, advantages, disadvantages, communicate, font, style, landscape, portrait, orientation, placeholder, template, layout, content, desktop publishing, copy, paste, purpose, benefits. animation, flip book, stopframe, frame, sequence, image, photograph, setting, character, events, onion skinning, consistency, evaluation, delete, media, import, transition.	audio, microphone, speaker, headphones, input device, output device, sound, podcast, edit, trim, align, layer, import, record, playback, selection, load, save, export, MP3, evaluate, feedback. 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,	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 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, split, trim, clip, edit, reshoot, delete, reorder, export, evaluate, share.	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. TinkerCAD, 2D, 3D, shapes, select, move, perspective, view, handles, resize, lift, lower, recolour, rotate, duplicate, group, cylinder, cube, cuboid, sphere,

					zoom, undo, font.		cone, prism, pyramid, placeholder, hollow, choose, combine, construct, evaluate, modify.
Programming	Screen time, healthy, computers, tablets, internet, apps.	Bee-Bot, forwards, backwards, turn, clear, go, commands, instructions, directions, left, right, route, plan, algorithm, program. ScratchJr, command, sprite, compare, programming, area, block, joining, start, run, program, background, delete, reset, algorithm,	instruction, sequence, clear, unambiguous, algorithm, program, order, prediction, artwork, design, route, mat, debugging, decomposition sequence, command, program, run, start, outcome, predict, blocks, design, actions, sprite, project, modify, change,	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. motion, event, sprite, algorithm, logic, move, resize, extension block, pen up, set up, pen, design, action,	Logo (programming environment), program, turtle, commands, code snippet, algorithm, design, debug, pattern, repeat, repetition, count-controlled loop, value, trace, decompose, procedure. Scratch, programming, sprite, blocks, code, loop, repeat, value, infinite loop, count-controlled loop, costume, repetition,	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 Selection, condition, true, false, count-	variable, change, name, value, set, design, event, algorithm, code, task, artwork, program, project, code, test, debug, improve, evaluate, share, assign, declare Micro:bit, MakeCode, input, process, output, flashing, USB, trace, selection, condition, if then else, variable, random, sensing, accelerometer, value, compass, direction,

		predict, effect, change, value, instructions, design.	algorithm, build, match, compare, debug, features, evaluate, decomposition, code.	debugging, errors, setup, code, test, debug, actions	forever, animate, event block, duplicate, modify, design, algorithm, debug, refine, evaluate.	controlled loop, outcomes, conditional statement, algorithm, program, debug, question, answer, task, design, input, implement, test, run, setup, operator	navigation, design, task, algorithm, step counter, plan, create, code, test, debug.
Data and information	Forwards, backwards, side to side, left, right, arrows.	object, label, group, search, image, property, colour, size, shape, value, data set, more, less, most, fewest, least, the same	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	attribute, value, questions, table, objects, branching, database, objects, equal, even, separate, structure, compare, order, organise, selecting, information, decision tree.	data, table, layout, input device, sensor, logger, logging, data point, interval, analyse, dataset, import, export, logged, collection, review, conclusion.	database, data, information, record, field, sort, order, group, search, value, criteria, graph, chart, axis, compare, filter, presentation.	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.