St Margaret's CEVA Primary School Progression Map

Subject: Computing

Intent: In Computing we intend to teach the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. We will build on this knowledge and understanding so that pupils use information technology to create programs, systems and a range of content. We will focus on being safe whilst working in a digital environment and understand the digital footprint we leave. The curriculum will develop pupil's digital literacy – so that they able to use, and express themselves at a level suitable for the future workplace and as active participants in a digital world.

E-Safety – At St Margaret's, this is taught half termly with additional sessions if and when the class teacher or DSL feels is beneficial. We use Project Evolve as our curriculum scheme and make use of the Knowledge Maps feature to ascertain the learning objectives for each individual class. This ensures the children in each class cover the areas associated with E-safety that they need support with and not a generalized one size fits all approach. We use the National Curriculum Objectives as our overall aim for what we would like children to know and be able to do regarding E-safety by the time they leave in Year 6. This is to use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

Autumn	**EYFS**	**Key Stage 1**		**Key Stage 2**			
	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Knowledge	Show an interest in technological Know about sensible amounts of 'screen time' Understand and begin to explore different uses of technology Understanding of personal details Understand who to see help from	**Technology Around Us** Identifying Technology Identifying a computer and its main parts (IT1) Creating rules for using technology responsibly (DS1;DS2) **Digital Painting** Describing what different freehand tools do (DL1) Making careful choices when painting a digital picture (DL1) To compare painting a picture on a computer and on paper (DL1)	**Information Technology Around Us** Recognising the uses of Information Technology Identifying IT in the home and beyond school (IT1) Understanding how IT helps us (IT1) Understanding how to use IT safely (DS1) **Digital Photography** Knowing what devices can be used to take photographs (DL1) Describing what makes a good photograph (DL1)	**Connecting Computers** Understanding how digital devices function (IT2) Understanding how computer networks share information Recognising the physical components of a network (IT2) **Stop-Frame Animation** Understanding that animation is a sequence of drawings, photographs or digital images (DL2)	**The Internet** Understanding how networks connect to other networks (IT2) Recognising how networked devices make up the internet (IT2) Understanding how websites can be shared via the World Wide Web (IT2) Understanding how content can be added and accessed (IT2) Evaluating the consequences of unreliable content (IT3) **Photo Editing** Understanding that digital images can be changed for different uses (DL2) Recognising that not all images are real (DL2) Evaluating how changes can improve an image (DL2)	**Systems and searching** Understanding that computers connect together to form systems (IT2) Recognising the role of computer systems in our lives (IT2) Understanding how information is transferred over the internet (IT2) **Video Production** Recognising video as moving pictures Identifying digital devices that can record video (DL2)	**Communication and collaboration** Understanding how search engines select results (IT3) Understanding how search results are ranked (IT3) Evaluating different methods of online communication (IT3) **Web Page Creation** Reviewing an existing website (DL2) Considering the ownership and use of images (D L 2) Understanding the implications of linking to content owned by other people (DL2)

Skills	Give and follow instructions with one or more steps Develop fine motor skills to use devices competently, safely and confidently Recognise, sort and compare objects Identify and finish a repeating pattern Experiment with creating digital images IWB/iPad/ camera Develop resilience in the face of a challenge	**Technology Around Us** Using a mouse in different ways (DL1) Using a keyboard to type Using a keyboard to edit text (DL1) **Digital Painting** Using shape tools and line tools (DL1) Using a computer to paint a picture (DL1)	**Digital Photography** Using a digital device to take a photograph (DL1) Using tools to change an image (DL1)	**Stop-Frame Animation** Planning and creating an animation Reviewing and improving an animation (DL2)	**Photo Editing** Changing the composition of an image (DL2) Making good choices when selecting tools (DL2)	**Systems and Searching** Contributing to a shared project online (DL2) Video Editing Capturing video using a digital device (D L 2) Improving video by reshooting and editing (DL2)	**Communication and collaboration** Using a search engine efficiently (IT3) Being a safe, respectful and responsible digital citizen (DS1;DS3) Explain how a computer system, such as a search engine, works. (IT3) **Web Page Creation** Planning and creating a web page (DL2) Thinks logically and systematically when solving problems in the designing of a web page. (DL2) Uses a range of technologies to create content (DL2)

Spring	EYFS	Key Stage 1		Key Stage 2			
	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Knowledge	Begin to make predictions Access, understand and interact with a range of technology	**Moving a Robot** Understanding what a given command will do (CS1) **Grouping data** Labelling objects Identifying that objects can be counted (DL1) Describing objects in different ways (DL1) Comparing groups of objects (DL1) Answering questions about groups of objects (DL1)	**Pictograms** Recognising that we can count and compare objects using tally charts (DL1) Recognising that objects can be represented as pictures (DL1) Recognising that people can be described by attributes (DL1) **Robot Algorithms** Describing a series of instructions as a sequence (CS1) Understanding what happens when we change the order of instructions (CS3)	**Sequencing** Identifying the importance of the sequence of code (CS6) Recognising that a sequence of commands can have an order (CS6) **Branching Databases** Identifying the object attributes needed to collect relevant data (DL2) Understanding why it is helpful for a database to be well structured (D L 2) Comparing pictograms with branching databases (DL2)	**Audio Production** Understanding that sound can be digitally recorded (DL2) Evaluating choices (DL2) **Repetition in Shapes** Understanding what 'repeat' Means (CS6)	**Flat-File Databases** Comparing paper and computer databases (DL2) Understanding how grouping and sorting data helps us answer questions (DL2) Understanding that computer programs can be used to compare data visually (DL2) **Vector Drawing** Understanding that drawing tools can be used for different outcomes (DL2) Understanding that vector drawings consist of layers (DL2) Evaluating vector drawings (DL2)	**Spreadsheets** Identifying questions that can be answered using data (DL2) Understanding that formula can be used to produce data (DL2) **Variables in games** Explore and understand what variables are in relation to real-world examples and understand how these can be set and changed (CS7) Learn how variables can be programmed by reading existing code (CS7)
Skills	Follow two-step instructions Continue to show resilience and perseverance Further develop fine motor skills Create short sequences using shapes, balances and travelling actions Use technology to play games – IWB/ iPad	**Moving a Robot** Combining forwards and backwards commands to make a sequence (CS1;CS2) Combining four direction commands to make sequences (CS1;CS2) Planning a simple program (CS1;CS2) Finding more than one solution to a problem (CS3) **Grouping data** Counting objects with the same properties (DL1)	**Pictograms** Creating a pictogram (DL1) Selecting objects by attribute and making comparisons (D L 1) Presenting information using a computer (DL1) **Robot Algorithms** Using logical reasoning to predict the outcome of a program (CS3) Designing an algorithm (CS2) Creating and debugging a program (CS2)	**Sequencing** Write a sequence of code to complete a task (CS4; CS6) Exploring a programming environment Creating a project from a task description (CS4) **Branching Databases** Creating questions with yes/no answers Creating a branching database (DL2) Identifying objects using a branching	**Audio Production** Using a digital device to record sound (DL2) Changing audio through Editing (DL2) **Repetition in Shapes** Creating a program in text-based language (CS4;CS6) Modifying a count-controlled loop (CS6) Decomposing a program into parts (CS5) Creating a program that uses count-controlled loops (CS6)	**Flat-File Databases** Using a form to record information (DL2) Using knowledge of databases to ask and answer questions (DL2) **Vector Drawing** Creating a vector drawing by combining shapes (DL2) Using tools to achieve a desired effect (D L 2) Grouping objects to make them easier to work with (DL2)	**Spreadsheets** Applying formula to data, including duplicating (D L 2) Collecting data for a spreadsheet (DL2) Creating a spreadsheet (DL2) Choosing suitable ways to present data (DL2) **Variables in games** Use variables to create a simulation of a scoreboard. (CS7) Design, create and modify at variables based game to meet their own design (CS4; CS7)

	Change colour and pen size when drawing digital images Order objects			database (DL2)			

Summer	EYFS	Key Stage 1		Key Stage 2			
	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Knowledge	Talk about why things happen Independently manage own basic needs Give reasons why we need to stay safe online Programme Bee-Bots to go forwards and backwards Share creations, talk about process and evaluate their work	**Digital Writing** Understanding that the look of text can be changed (DL1) Understanding why certain tools have been used (DL1) Comparing writing on a computer with writing on paper (DL1) **Programming animations** Choosing a command for a given purpose (CS2) Identifying the effect of changing a value (CS3) Understanding that each sprite has its own instructions (CS1)	**Digital music** (DL1) Saying how music can make us feel Identifying that there are patterns in music Describing how music can be used in different ways Showing how musical notes can be represented on a digital device **Programming Quizzes** Understanding that a series of commands has a start and an outcome (CS1) Deciding how a project can be improved (CS2)	**Desktop Publishing** Recognising how text and images convey information Recognising that text and layout can be edited (DL2) Considering how different layouts suit different purposes (DL2) Considering the benefits of desktop publishing (DL2) **Events and Actions** Understanding how a sprite moves (CS4)	**Repetition in Games** Understanding that in programming there are infinite loops and count-controlled loops (CS6) **Data Logging** Understanding that data can be used to answer questions (DL2) Understanding that data loggers collect 'data points' from sensors over time (DL2)	**Selection in Quizzes** Understanding how selection is used in computer programs (CS6) Understanding how selection directs the flow of a program (CS6) Evaluating programs (CS8) **Selection – Conditionals** Understand simple instructions and rules relating to if/else statements (CS7) Revisit loops in programming and understand how these can be used with conditionals by looking at 'until' loops (CS6;CS7)	**Sensing Movement** Brings together all four programming constructions (Year 3 – sequence, Year4 – repetition, Year 5 – selection, Year 6 (taught in 5) – Variables). Utilises a physical computing device – micro: bit (CS4;CS5;CS6;CS7;CS8)
Skills	Explore how a Bee-Bot works Begin to explore how to use QR codes Verbally organise, sequence and clarify thinking, ideas, feelings and events Follow instructions of three steps or more	**Digital Writing** Using a computer to write (DL1) Add and remove text on a computer Changing text (DL1) **Programming animations** Showing that a series of commands can be joined together (CS1)	**Digital music** Creating music for a purpose Reviewing and refining computer work (DL1) **Programming quizzes** Creating a program using a given design (CS2) Changing a given design (CS2) Creating a program using my own design	**Desktop Publishing** Choosing appropriate page settings (DL2) Adding content to a desktop publishing publication (DL2) **Events and Actions** Creating a program to move a sprite (CS4) Adapting a program to a new context CS4) Adding features to a program (CS4)	**Repetition in Games** Developing the use of count-controlled loops (CS6) Developing a design that includes two or more loops running at the same time (CS6) Modifying an infinite loop (CS6;CS4) Creating a project that includes repetition (CS6) **Data Logging**	**Selection in quizzes** Creating a program that uses selection (CS6) **Selection – Conditionals** Practice using conditionals in coding in a game based and problem solving setting (CS7) Write codes that function differently depending on the	**Sensing Movement** Using the micro: bit for pupils to build and transfer their programming knowledge and skills into a new programming environment before adding more depth. (CS8;CS5;CS7)

	Show resilience and perseverance in the face of challenges Show an 'I can do' attitude Type their name using a laptop	Designing the parts of a project (CS2) Using an algorithm to create a program (CS2)	(CS2)	Identifying and fixing bugs in a program (CS8) Designing and creating a maze-based challenge (CS6)	Using a digital device to collect data (DL2) Using data to find information (DL2)	specific conditions of the program encounters (CS7; CS8)	

Impact (End Points)						
EYFS	**Key Stage 1**		**Key Stage 2**			
Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Children recognise uses of technology in the EY environment. They develop skills to be able to confidently operate a number of technological devices. They can explain simple ways to keep themselves safe online and where to see support.	Children should be able to confidently log in and use a range of technology/programs e.g. Vex bots, computer, camera. They use different technology/programs appropriately to type, locate, identify and create.	Children can recognise different forms of information technology. They know how to stay safe when working online. Children can understand how code moves a sprite and how to write an algorithm for movement. They can take a Digital image using a device and use tools to adapt the image.	Children demonstrate a safe use of the Internet, awareness of privacy. Competent use of Word processing and publishing Accomplished at collecting, analysing, evaluating, presenting data and information using a branching database. Able to create programmes for different purposes	Children should be confident in using the internet safely (search engines) and who to report concerns to. Understand the benefits of using repetition in algorithms and the purpose of this, detecting and correcting simple errors. Experiment with the use media production and editing (digital images and audio) Using data loggers in a Scientific research context	Children will know how to use a variety of different programs to achieve a desired outcome. They will be able to identify and debug algorithms in order to create quiz and use conditionals when programming. Children will be able to use spreadsheets to collect and calculate data and present it in a variety of ways. They know how to stay safe online and how to behave responsibly online and understand about copyright and ownership with regards to online content.	Children are able to use logical reasoning to explain how simple algorithms work in different programs and be able to apply their knowledge and understanding. They can explain using both real world and programmed examples what a variable is. Children should be able to use search technologies effectively and independently. Children should be able to understand computer networks, including the internet and be able to use them safely, respectfully and responsibly.

Vocabulary						
EYFS	**Key Stage 1**		**Key Stage 2**			
Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Computer Different Instructions object Safely Same Tablet Technology	algorithm attribute block button colour palette command cursor digital painting double-click drawing tools font group keyboard label left-click mouse / trackpad object program property right-click robot screen shut down sprite technology tool settings	(de)bug algorithm attribute back-space barcode block block diagram caps-lock Code command composition computer data debugging digital photography framed filters image information technology landscape object orientation outcome pictogram portrait positioned robot save scanner sequence sprite	Algorithm animation attribute blocks Code Command Computer Network control panel costume Data Database Debug Decompose Digital Device digital resources Execute (run) event field Font grouping hardware Hub image input Input device Internet Multimedia network Network Switch Onion skinning orientation Object	animation pane computer network composition contribution data data logger editing / trimming exporting graph infinite loop internet logo loop (count-controlled) pattern pod-cast repetition resolution sensor switch table Turtle wave form webpage website WWW (World Wide Web)	algorithm conditional connections data data base data set deconstruct field groups grouping input if/then layering loops (condition controlled, count controlled, infinite, until) output pan / tilt password strength rastor images record search engine search ranking selection software storyboard – shot/ techniques sorting system vector images webcrawler (spider) zoom – in/ out	Algorithm breadcrumbs Cell Cell name Code column copyright data debugging Domain Name System (DNS) Formula HTML (HyperText Markup language) Internet Protocol (IP) packets Program protocol Row Spreadsheet If/then/else URL (Uniform Resource Location) Variable Web address Web Browser Web page website

		subject tally chart zoom	output output device personal data place holder Process Programme/ script programming record retrieve Router sequence Server Stored data template text text box WiFi White space word processing WAP (Wireless Access Point)			

National Curriculum Objectives for Computing in KS1 and KS2

Key stage 1

Computer Science

- understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions (CS1)
- create and debug simple programs (CS2)
- use logical reasoning to predict the behaviour of simple programs (CS3)

Information and Technology

- recognise common uses of information technology beyond school (IT1)

Digital literacy

- use technology purposefully to create, organise, store, manipulate and retrieve digital content (DL1)

Digital safety

- use technology safely and respectfully, keeping personal information private (DS1)

- identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies (DS2)

Key stage 2

Computer Science

- design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems (CS4)
- solve problems by decomposing them into smaller parts (CS5)
- use sequence, selection, and repetition in programs (CS6)
- work with variables and various forms of input and output (CS7)
- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs (CS8)

Information and Technology

- 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 (IT2)
- use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content (IT3)

Digital literacy

- 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 (DL2)

Digital Safety

- use technology safely, respectfully and responsibly (DS1)
- recognise acceptable/unacceptable behavior (DS3)
- identify a range of ways to report concerns about content and contact (DS2)