Computing Milestone Progression

Children need to be secure in the black Milestones before progressing to the purple.

Threshold Concepts	Milestones					
	Milestone 1 Year 1 and 2		Milestone 2 Year 3 and 4		Milestone 3 Year 5 and 6	
Connect **(Computing systems and networks)** This concept involves developing an understanding the use of digital devices and how to safely connect with others.	**Technology Around Us**	• Identify technology • Identify a computer and its main parts • Use a mouse in different ways • Use a keyboard to type on a computer • Use the keyboard to edit text • Create rules for using technology responsibly • To recognise the uses and features of information technology	**Connecting Computers**	• Explain how digital devices function • Identify input and output devices • Recognise how digital devices can change the way 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	**Systems & Searching**	• Explain that computers can be connected together to form systems • Recognise the role of computer systems in our lives • Experiment with search engines • Describe how search engines select results • Explain how search results are ranked • Recognise why the order of results is important, and to whom
	IT Around US	• 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	**The Internet**	• 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	**Communication & Collaboration**	• 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 • Evaluate different methods of online communication

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Code (Programming) This concept involves developing an understanding of instructions, logic and sequences.	**Making a Robot**	• Explain what a given command will do • 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	**Sequencing Sounds**	• 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 a project • Create a project from a task description	**Selection in Physical Computing**	• 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
	Robot Algorithms	• Describe a series of instructions as a sequence • Explain what happens when we change the order of instructions • Use logical reasoning to predict the outcome of a program • Explain that programming projects can have code and artwork • Design an algorithm • Create and debug a program that I have written	**Repetition in Shapes**	• 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	**Variables in Games**	• Define a 'variable' as something that is changeable • Explain why a variable is used in a program • Choose how to improve a game by using variables • Design a project that builds on a given example • Use a design to create a project • Evaluate a project

	Programming	• 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	**Events & Actions**	• 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 a program by adding features • Identify and fix bugs in a program • Design and create a maze-based challenge	**Selection in Quizzes**	• 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 which uses selection • Create a program which uses selection • Evaluate a program
	Programming Quizzes	• 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 my own design • Decide how a project can be improved	**Repetition in Games**	• 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	**Sensing Movement**	• 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

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Communicate **(Creating Media)** This concept involves using apps to communicate one's ideas.	**Digital Painting**	• Describe what different freehand tools do • Use the shape tool and the line tools • Make careful choices when painting a digital picture • Explain why I chose the tools I used • Use a computer on my own to paint a picture • Compare painting a picture on a computer and on paper	**Stop-Frame Animation**	• 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	**video Production**	• Explain what makes a video effective • Identify digital devices that can 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
	Digital Photography	• Use a digital device to take a photograph • Make choices when taking a photograph • Describe what makes a good photograph • Decide how photographs can be improved • Use tools to change an image • Recognise that photos can be changed	**Photo Editing**	• 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	**3D Modelling**	• 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 my own 3D model • Create my own digital 3D model

	Digital Writing	• 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 I used the tools that I chose • Compare typing on a computer to writing on paper	**Desktop Publishing**	• 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	**Introduction to Vector Graphics**	• 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 • Group objects to make them easier to work with • Apply what I have learned about vector drawings
	Digital Music	• 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 our computer work	**Audio Production**	• 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	**Web Page Creation**	• 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

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Collect **(Data & Information)** This concept involves developing an understanding of databases and their uses.	**Grouping Data**	• 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	**Branching Databases**	• 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	**Flat-File Databases**	• Use a form to record information • Compare paper and computer-based databases • Outline how you can answer questions by grouping and then sorting data • 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
	Pictograms	• 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 • Recognise that people can be described by attributes • Explain that we can present information using a computer	**Data Logging**	• 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	**Spreadsheets**	• 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