Computing Curriculum Overview

EYFS

Throughout the EYFS Currciulum, Computing is embedded throughout. Some examples of this are as follows:

- Children will use toy phones, cameras and computers whilst learning through play in the continuous provision.
- Children will begin to programme a 'BeeBot' to travel along a map.
- Children will all take a photograph using a tablet.
- Children will learn to operate a story telling device.
- Children will compare technology from the past.
- Children will play games on the Interactive White Board.

Unit of work	Coding	Digital photographs	Use technology safely Creating digital photographs Animal prints	Common uses of technology Bar codes
Prior learning				
Significant Individuals				Norman Joseph Woodland – inventor of barcodes
Essential knowledge	1. Know that an algorithm is a set of instructions Know the 4 commands for the Beebot in a sequence including forwards/backwards. 2. Know that to operate a Beebot, you need to give it instructions via a keypad 3. Know how to debug instructions on a Beebot (and how to clear previous instructions)	1. Know that images can be taken using different devices 2. Know that photos can be imported into apps 3. Know what photos can be manipulated e.g. text added 4. Know that photos can be saved to be viewed or amended further	1. Begin to understand how to keep personal information private 2. To know what devices can be used to obtain photographs 3. To save images with a suitable name 4. To retrieve images and import them into a program 5. To change the size and position of an image 6. To manipulate an image by adding text to it	1. I know that technology is used in many different ways outside of school and I can describe some 2. I know that a barcode is used to identify different products and that the same products have the same barcode. A barcode links to information about a product 3. I know that a QR code links to information online 4. I know that a password is used to protect information online 5. I know that I can talk to trusted adults if I am worried about anything online
Quick Quiz	What instructions do you need to use to make the Beebot …..? What is an algorithm? How many steps are needed to make the Beebot …?	What devices can be used to take photos? How can you change a photo?	How do you save an image? Can you give an example of personal information that needs to be kept private?	What is a barcode / QR Codes? What does a barcode / QR Codes do? Who can you speak to if you are worried about something online?

			How do I make the image smaller? Larger?	
Vocabulary	BeebotAlgorithm Sequence Left/right Forwards/backwards Input Output bug De-bug	Import Edit Device Landscape portrait	Personal information Search Import Password Save Open	barcode QR code e-safety password

Year 2			
Unit of work	Coding: Scratch Jr	Use technology safely Common uses of technology – researching	Create and manipulate digital photographs
Prior learning	Year 1 Beebots and coding apps (ALEX Pro, Daisy the Dino, Beebot app)	Experience in Year 1 of searching for images online	Year 1 manipulating photos and adding images to them
Significant Individual		**Larry Page (b. 1973) and Sergey Brin (b. 1973): The founders of Google®**	
Essential knowledge	1. To know that a series of instructions is called an algorithm 2. Know when and how to debug programs 3. Know that the background and sprite on screen can be manipulated 4. Know what happens when the order of instructions is changed 5. Know that programming projects can have artwork to enhance	1. To know that the Internet can be useful for research. 2. To know that searching on the internet requires precise key word searches 3. To know the name of a child friendly search engine. E.g. kiddle 4. To know what to do if concerned about online content	1. I know that a digital photos can be taken on different devices 2. I know how to retrieve and save photos as well as delete the ones I do not want 3. I know that there are different apps which can be used to edit photos 4. I know that the same photo can be used in different ways with different effects and backgrounds
Quick Quiz	Can you explain the algorithm to make the Beebot…? What happens if I take out one instruction? Can you predict how it would change? What is an algorithm?	What words would be useful to use to search for information about …? Can you tell me a good search engine for children to use? What do you do if you are worried about something you see online?	How can you change the angle of an image? How can you zoom in? How can you edit a photo? Why is it important to have a person's permission to take a photo?
Vocabulary	Sequence Clear Order Commands Prediction Design Route debug	Content Internet Search Search engine Precise key words	ipad camera download edit size layout digital

Year 3			
Unit of work	Coding	Use technology safely Emailing	Understand how networks work
Prior learning	Year 2 using Scratch Jr to code a sprite to follow an algorithm	Previous experience of using the internet to search for information	Children have used the internet to search for information
Significant Individuals			**Sir Tim Berners-Lee (b. 1955): The inventor of the World Wide Web**
Essential knowledge	1. Know that a sprite is the object programmed to move 2. Identify sprites and background in a program 3. To know event blocks are yellow and movement blocks are dark blue on Scratch 4. To know how to write a code that makes a sprite move on screen	1. To know what an email is. 2. To know the advantages of email over post. 3. To explain different parts of an email address 4. To know how to send an email 5. To know what to do if they receive an inappropriate email	1. I know that search engines are used to help find information on line and can explain simply how these work 2. I know that a simple computer network is a selection of devices that are joined either physically or via wi-fi 3. I can explain how a simple computer network works 4. I know that networks may contain routers, switches and servers as well as printers and computers or tablets 5. I know that a router sends packets of information along the network
Quick Quiz	What is a sprite? What instructions would make it move across the screen? What instructions would make it change direction? What is a stage in Scratch and how do you select one?	What is an email? How do I know the sender? Recipient? How can I keep myself and others safe using email?	What is a search engine? What is a network? How does a network work? What parts do you know of it?
Vocabulary	Scratch Program Code Costume Motion Event Order	Email Internet Password Send / receive Domain @	digital device input output process program connection network packets

Year 4			
Unit of work	Coding – using sequencing, selection and repetition	Select and combine software on a range of devices – making music	Evaluating digital content Presenting data in graphs
Prior learning	Previous experience in Years 2 and 3 using Scratch to code a sprite to move and follow a sequence	Previous experience of programming and debugging using other software on Scratch (Y2,3,4) Layering images/text on Picolage in Year 2)	Children have learnt in coding about inputs and outputs (Years 1,2,3,4) Maths: statistics.
Significant Individual			**Donald Knuth (b. 1938): The master of computer programming languages**
Essential knowledge	1. Know that a program can be broken down into smaller parts to solve it 2. Know how repetition works and that it can help reduce the number of steps that need to be written 3. Know what is meant by input and output 4. Know that variables can be used to introduce scoring to a game	1. To know how Isle of Tune creates music 2. To know how to select different instruments 3. To be able to change the pitch of the chosen instruments 4. To know how to layer sounds 5. To be able to change the tempo of the music. 6. To debug and edit the tune/composition for effect.	1. I know that spreadsheets contain cells, rows and columns 2. I know that data is input on spreadsheets by clicking the cell you want to enter data in 3. I know that information in spreadsheets can be presented in different ways, e.g. a table can be made into a graph 4. I can spot and correct errors in algorithms 5. I can solve problems in algorithms by breaking them down into smaller parts
Quick Quiz	What does repetition mean in programming? Why would we use it? What is input and output? Can you give examples? What is a variable?	Music link: What is pitch? Tempo? What does layering sounds mean? How do you change the pitch of a sound? How do you change the tempo?	What is a cell? How do you use a formula to add numbers? Why are formulas useful? How can I change numerical data into a graph?
Vocabulary	Program Debug Input / Output Variables	Layer Tempo Pitch Instrument Tune Composition	cell row column formula spreadsheet graph

Year 5			
Unit of work	Cryptographers / Coding	Online safety and codebugs	3D Modelling - Computer-Aided Design
Prior learning	Previous experience of knowing the importance of keeping personal information private Y3 Networks and email Y1 Barcodes	Earlier learning on how to stay safe online	Prior experience of de-bugging and evaluating own work
Significant Individual	**Shafi Goldwasser (b. 1959) and Silvio Micali (b. 1954): Innovators in cryptography and complexity theory**	**Steve Jobs (1955-2011): The mastermind behind Apple®**	
Essential knowledge	1. Know that private information that is to be shared needs to be encrypted 2. Know that for passwords to be safe, they need to be difficult to guess / work out 3. Know that semaphore is a means of sending a message 4. Know that morse code is a means of communicating a message 5. Know what encryption is and why some information needs encrypting	1. To know the importance of using technology safely. 2. To know how to report concerns 3. To develop their understanding of e-safety and responsible use of technology. 4. To create content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.	1. I know that 2d images on screen can represent 3d images 2. I know that CAD software enables me to create 3d images on screen 3. I know that texture and colour can be added to the image 4. I know that images can be resized, rotated and combined
Quick Quiz	What does encryption mean? Why is it important? What is semaphore? How does it work? What is morse code? How does it work?	How can I keep myself and others safe online? Who do I tell if I am concerned? How can I play a game / use a phone or tablet safely?	What is CAD? What are the advantages of using CAD? How do I change the texture / colour of the object? How do I change the perspective I view the building?
Vocabulary	Encryption Morse code Semaphore Password	Green screen E-safety Animation Transition Powerpoint	CAD texture position re-size orientation

Year 6			
Unit of work	Select use and combine a variety of software on a range of devices	Coding – using sequencing, selection and repetition in programs using inputs and outputs	Design, write and programs that accomplish a specific goal
Prior learning	Use of Excel to create spreadsheets in Year 4 Maths: statistics	Children have used Isle of Tune in Year 4 to compose music	Children have used Scratch to create quizzes
Significant Individuals			**Ada Lovelace (1815-1852): The first computer programmer**
Essential knowledge	1. To know that Excel is a program that can be used to collect and analyse data 2. To know that cells need to be formatted correctly for data to be effectively analysed 3. To know that SUM can be used to add to add several cells data together 4. To know that data can be ordered according to different criteria 5. To know that Excel can present data as graphs and charts	1. To know what a 'loop' is in music and to create a 'loop' to repeat rhythms. 2. To know how to layer loops of different instruments 3. To know that compositions can be recorded and how to do this. 4. To know how to edit / delete sounds 5. To know how to create a composition to portray a particular mood.	1. I know that operators are used to compare variables and values, do calculations and work with strings of text 2. I know that variables can be modified in a program to have different effects 3. I know that sensing is used to detect different factors in a project 4. I know that a block is a sequence of one or more linked coding statements 5. I can create a sprite which remains visible on screen
Quick quiz	What does formatting a cell mean? What happens if this is done incorrectly? How do you fix it? What is SUM? How does it help? How can you order data differently? Why might you?	What is a loop in music? How do you create one? What are layers in music? How do you edit a sound?	Can you explain what an operator is? What is sensing and why would you use it in a game? What does a wait block do, and why is it useful?
Vocabulary	Cell Column Row Formula Data Graph Table Calculate Format Average Ascending Descending Insert	Layer sequence Loop selection Composition pitch Delete tempo Edit	block variable sensing operator stage