Captain Cook Primary School

Computing Curriculum

Non-Negotiable Curriculum and Assessment Document

Computing Non-Negotiables — Year 1

	Programmes of Study	Non-Negotiable Criteria	Possible Lines of Direction	Resources
Year 1: Using a Programmable Toy:				
Programming	• 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 programmable toys for a purpose; • Develop a program using a programmable toy. • Record program for others to follow • Correct errors in adult generated programs using a floor robot or screen turtle • Use a screen turtle. • Understand buttons for commands	• Learn how to direct a Programmable toy or screen character • Write a simple set of instructions for the programmable toy/screen character to complete a route • Test, share and improve the instructions	Programmable toys Beebot/Constructa bot 2 Go
Year 1: Giving a computer instructions to make something happen: Introduction to coding on a computer Espresso Coding Unit 1 A and B				
Programming	• 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	• Create an instructional algorithm • Understand that an algorithm is a series of instructions • Test program and correct errors	• Introduce the program 'Espresso Coding' to the children • Show an example of an app made using Step 5 of this lesson (Lesson 1 Year One) • Talk about the sea creatures and their movement • Explain that the computer is making the sea creatures move by following instructions called code • Explain that code is the word we use to describe instructions we give a computer and that children will learn to give the computer instructions so that they can make their own scenes like this • Discuss how the different creatures are moving and which instructions thy would need • Watch the first video demonstration • Show children how to drag the fish and arrow icons into the start function box • Explain that the code will make the fish swim forwards • Run the app so the children can see the fish swimming forwards • Allow children to explore and trial the program for themselves • Stop to address any issues, problems or misconceptions • Run the apps and share the results • Repeat increasing complexity	**Espresso Coding** Espresso Coding Teacher Units (Teacher - Computing Resources - Espresso Lesson Plans)

Year 1: Creating an e-book				
Using Technology	• Use technology purposefully to create, organise, store, manipulate and retrieve digital content • Recognise common uses of information technology beyond school	• Recognise that technology can help to collect data • Understand that information can be stored in different ways (sound, text, video, images) • Use a range of programs to gather and store information • Use the filing system on the school network • Use different input devices to store information (cameras, mp3 players)	• Show an eBook such as an online interactive story book to the class • Introduce the topic for your eBook and show a simple eBook made using 2 Create a story • Plan or retell a simple story to transcribe into an eBook e.g. instructions, stages in a life cycle or simple information book • Show children how to double click to open 2 create a story (desktop shortcut) • Open 2 Create a story and show children the picture and text areas on the page and how to access them • Using story plan children draw a related picture using the 2 Simple tools and add text and save their work • Children continue to add pages to their story opening and retrieving the work. • Use the playback feature to check work • Demonstrate to the whole class adding sound to their saved story • As children complete their transcriptions and pictures plug in a microphone and ask children to read out each page. • Save and show to the class the final eBooks. Share with other classes; upload to e-Schools webpage, print for display.	**2 Create a Story** **Textease** **TuxPaint** **Paint** **2Paint** **Word** **2 Simple**
Year 1: Filming Instructions				
Using Technology	• 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	• Create a story or instructional algorithm • Direct a person bot' through a simple algorithm • Understand that an algorithm is a series of instructions • Record program for others to follow • Correct errors	• Watch a video clip of a cooking or other demonstration • In literacy, write a series of simple instructions e.g. a recipe • Practise carrying out the instructions to check for errors • Film your own instructions using digital cameras/ iPads • Model, downloading the videos and saving them on the computer (Whole class can be inserted into a PowerPoint) • Watch and review • Upload the finished products to E Schools Class page	**Digital Camera** **PowerPoint** **Webcams** **I Pad** **MS Word** **MS Movie Maker** **iMovie**

Year 1: Finding images using the Web related to a subject/theme and creating an educational E Collage				
Using Technology	• Use technology purposefully to create, organise, store, manipulate and retrieve digital content • 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	• Recognise that technology can help to collect things such as data or images • Understand that information can be stored in different ways (sound, text, video, images) • Use a range of programs to gather and store information • Use the filing system on the school network • Use different input devices to store information (cameras, mp3 players)	• Choose a theme or topic which you are working on for the children to research. • Show children examples of photo and picture collages and mood boards • Children write a list of examples of photos to include in their collage • Children take photos using digital cameras/iPads • Demonstrate saving photos into agreed location • Use a google image search to add extra pictures and photos as a class or individual to the shared file • Open www.photovisi.com from a desktop link or iPad add Explain Everything. • Choose a background for your photo collage • Model how to retrieve saved pictures and adding them into your photo collage and follow the instructions to complete your collage • (teacher) Save final version and present to class (right click and save picture) • Print out and display	www.photovisi.com Internet browser PowerPoint IWB software iPads Ipad App: Explain Everything.
Year 1: Logging on to the school network and understanding security				
Understanding Technology	• 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 • Recognise common uses of information technology beyond school	• Understand when and why passwords are used • Agree rules for using the computer • Understand 'log on' Recognise a range of technology in the workplace, in the home, in the world around them • Describe the uses of technology and begin to understand how to use technology for a range of purposes	• Show a computer which has just been switched on: What can the children see? • Discuss the two boxes for the username and the password and why they are there. • Can children think of anything else where passwords or special codes are needed for access? (mobile phones, laptops, iPad, school gates, keys for houses, cars etc.) • Discuss reasons why security is needed for technology and other things • Make a simple poster of things that need passwords (in class) and add safety words to the postcode • Learn how to log on to the school network • Introduce the class pages for Year One and tell the children we have a safe place to store the things we make in school that can be viewed from home. • Issue passwords for children to log onto E Schools from home and demonstrate how to access the class pages • Allow children time to explore the class pages • Ask children to practice using their passwords and access the class pages for homework and show their family	School Network e-Schools Website

Computing Assessment Criteria

Key	Programming	Using Technology	Understanding Technology

Year 1

- I know that an algorithm is an instruction.
- I can create a simple set of algorithms (instructions) to control programmable devices or objects on screen.
- I can recognise if I have made a mistake in my instructions and try to rectify it.
- I can use technology purposefully to create digital content e.g. making an E Book or a photo collage.
- I understand that I can save and store my work for later using technology.
- I understand that I can use technology to collect things like information or pictures.
- I am aware of some safety issues related to using technology such as; the use of passwords on computer networks, mobile phones and school gates.
- I can recognise common uses of information technology beyond school.

Computing Non-Negotiables

Year 2

	Programmes of Study	Non-Negotiable Criteria	Possible Lines of Direction	Resources
Year 2: 2 Go writing simple sequences of instructions and testing them and Coding Espresso Unit 2A Using keys/buttons to initiate actions.				
Programming	• 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 programmable toys and screen turtles as programming devices • Correct errors in own programs on both a screen turtle and a floor robot. • Use the term 'debug'	• Remind children that in Y1 they used a program called 'Espresso Coding' and that coding is giving instructions to a computer to make things happen. • There is also a program called 2 Go which we can give instructions to the computer. • Allow children to explore 2Go functionality • Set a challenge for the class using to go e.g. Can you make the screen turtle to draw a square? Rectangle, triangle, a letter H etc. • Stop the children mid activity and discuss who has met the challenge? Who has not? What type of things can go wrong, do we need to remember? • When the children work out how to make the turtle draw their shape ask them to write down the instructions for another to follow • Share instructions with other class members to try out. • Explain that when we make a mistake in our instructions and then we solve the problem, it is called 'debugging' • Introduce the simple programming tool on 2Go allowing children to 'run' their sets of instructions and demonstrate how they input their notes from a previous lesson (Ctrl, Shift and 'o' (for orange)) • 'Run' their simple programs • Allow children to experiment with other simple 'runs' • Complete Espresso Coding Unit 2A referring to unit plans.	Espresso Coding 2 Go Espresso Coding Teacher Units (Teacher - Computing Resources - Espresso Lesson Plans)

Year 2: Espresso Coding – Writing our own code for Espresso Unit 2B				
Programming	• 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	• Write own narrative algorithms, using a list of commands, with precision and clarity • Create programs to be executed on a programmable toy • Understand that an algorithm is a set of instructions which is implemented as a program • Use the term 'debug'	• Revisit Espresso at an unseen unit (Year two Unit 2B) showing the children a demonstration from the final app. • Remind children that in order to make the digital images move or for things to happen they must be programmed with code or given a set of instructions. • Explain that you would like the children to write their own instructions for this scene without using a computer • Introduce the familiar coding symbols as used by Espresso and recap on the different symbols available (available to download from Espresso Coding) • Distribute symbols to cut up, glue and large paper (Differentiation: LA exactly the symbols they will need, HA A range of symbols they may or may not need) • Children scribe their movements referring to the animation throughout • Swap and check the instructions (Debugging) • Try the instructions • Work through Espresso Coding Unit 2B Referring to teachers guides if required	Espresso Coding Espresso Coding Teacher Units (Teacher - Computing Resources - Espresso Lesson Plans)

Year 2: Taking, selecting and editing digital images using a digital camera/iPad and publishing software				
Using Technology	• Use technology purposefully to create, organise, store, manipulate and retrieve digital content • Recognise common uses of information technology beyond school	• Recognise that technology can help to collect data • Understand that information can be stored in different ways (sound, text, video, images) • Use a range of programs to gather and store information • Use the filing system on the school network • Use different input devices to store information (cameras, mp3 players)	• Introduce a digital project related to a topic or theme explaining that the children will be taking photograph and adding information • Show large images of the school digital cameras or iPads and read and discuss their controls and operation • Allow children time to explore using a digital camera/iPad camera/video and then plan and take photographs relevant to the topics • Demonstrate how to upload and save digital images from the digital cameras and save the groups pictures in an agreed accessible area. Or show how to use the camera roll and create folders for images taken on iPads. • Using a computer demonstrate how to open the photograph file and view the photographs • Evaluate the photographs discussing what makes a good photograph (subject too small, large, blurry etc.) and how to delete unsatisfactory images • Using a simple programme such as Microsoft Word or 2Simple – 2 Publish demonstrate how to retrieve saved pictures and allow ch to practice; if using iPads 'Explain Everything' app could be used to insert and edit images/adding text features etc. • Ext: In MS Word images can be resized, cropped recoloured etc. using the 'Format' tab) • Add any text to the image (Ext make a poster, leaflet) and then print or use the finished product poster, display, Photo Story or Gallery for class web page • Consider how and where this could be useful?	**Digital Cameras** **MS Word** **2 Publish** **MS Picture Manager** **Picasa /Photoshop Elements** **Photo Story** **iPads** **Explain Everything App** Pixelr/Picasaweb

Year 2: Create a Mind Map related to a topic or theme				
Using Technology	• Use technology purposefully to create, organise, store, manipulate and retrieve digital content • Recognise common uses of information technology beyond school	• Collect a range of information using technology • Represent information in different ways • Create a range of digital content, save, retrieve and evaluate • Understand the file system on the school network and on and online space • Retrieve information from the Internet • Use a safe search • Select appropriate tools for a task	Could be useful at the beginning or end of a Learning Context? • Introduce a topic or theme and ask the children using pens and paper to mind map or jot down what they know about the subject • For homework can they add anything else through research? • At the end of the topic add to the mind map • Introduce the online software Tagxedo. Explain it is a Word Cloud generating software who will help us to remember all of our learning • Demonstrate how to use a search engine to search for the 'Tagxedo' website and to select and open the website • Demonstrate how to add the information from their mind maps ('Load') • Demonstrate using the arrow keys to select colour theme, shape and the Respin tool. • If time allows children could make a word cloud to represent their own interests or as a gift for Mother's day or Father's Day etc. • Save the work to the school network class file and print and share the word clouds for display or topic/subject revision.	Google/Bing http://www.tagxedo.com/app.html

Year 2: E Safety and Messaging				
Understanding Technology	• 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 • recognise common uses of information technology beyond school	• Recognise a range of technology in the workplace, in the home, in the world around them • Describe the uses of technology and begin to understand how to use technology for a range of purposes • Begin to experiment with simple email and messaging • Understand what personal information is and how to keep it private • Know what to do if something online makes them uncomfortable • Understand the difference between online world and the real world • How to be respectful and polite online • Agree e-safety rules • Choosing age appropriate material on the internet	• Mind map with the children how we use technology to communicate with one another • Which devices can we use? What do people send to each other? Why? (telephone, mobile, email, Facebook, Twitter, PlayStation, etc.) • Just like the post come to our homes we all need our own addresses in order to send things to get to the right person. Discuss phone numbers and email addresses or FB pages • Access the 'Thinkyouknow' website and work through the 5-7 Year old sections with the class. • (this may take several sessions accessing safety information, watching videos, follow up work) • Produce a poster in class to show that you understand E Safety and display around class/ICT Suite • Show the ESchools website and introduce the messenger facility. • Demonstrate sending a (group) message using E schools messenger • Help the children log (reminding them of the need for password security)on to ESchools and reply to your message • Allow them to experiment messaging friends within the class and explain they can message by accessing the website from home \as long as they follow the E Safety rules • Apply information learned to topic or theme e.g. Sending a thank you email following a visit or emailing questions to an expert about a topic • Watch: http://www.kidsmart.org.uk/teachers/ks1/sources/projet/The-Adventures-of-Smartie-the-Penguin.pdf	**E Schools Website** **Thinkuknow CEOP Website: https://www.thinkuknow.co.uk/5_7/** **Email software** **Word** http://www.kidsmart.org.uk/teachers/ks1/sources/projet/The-Adventures-of-Smartie-the-Penguin.pdf

Year 2: Using technology to record and collate data				
Handling Data	• use technology purposefully to create, organise, store, manipulate and retrieve digital content • recognise common uses of information technology beyond school	• Collect a range of information using technology • Represent data in different ways • Create a range of digital content, save, retrieve and evaluate • Understand the file system on the school network and on and online space	• Explain that you will be discussing how technology helps us to collect and analyse information • Show children some real/pictures of data collection technology e.g. digital thermometer, data loggers, pulse metres, digital weighing scales, web cams, slide shows of weather stations, heart monitors, walking apps etc. • Use a simple data logging device e.g. a temperature sensor to collect data linked to a topic or theme e.g. The weather or plan a series of questions and take a survey • Introduce 2 Graph (2 Simple) and demonstrate how to enter data into the blank table • Produce a graph exploring the different layouts generated by the program. Evaluate the best layout for your information and add titles and values to the axis • Analyse the data explaining what you have found out • Save work onto the school network • Share work on ESchools website or on a display around school or apply data in a newsletter, webpage or project.	**E Schools Website** **2 Graph** **2 Count** **PowerPoint/ Excel/2Count**

Computing Assessment Criteria

Key	Programming	Using Technology	Understanding Technology

Year 2

- I understand that programs execute (work) by following sets of precise instructions called algorithms
- I can correct my errors and solve problems on simple programs and know that this is called debugging
- I can use logical reasoning to predict the behaviour of simple programs
- I can use technology purposefully to organise (save, store and retrieve) digital content.
- I can use technology purposefully to manipulate digital content e.g making a word cloud, collecting and recording data.
- I can send an email
- I understand how to safely and respectfully use technology and I am aware of some E-safety measures such as, keeping my personal data private.
- I understand where to go for help and support when they have concerns about content or contact on the internet or other online technologies.

Non-Negotiable Curriculum: Computing — Year 3

	Programmes of Study	Non-Negotiable Criteria	Possible Lines of Direction	Resources
Year 3: Espresso Coding Units 3A and 3B Coding				
Programming	• 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	• Design and write programs with specific outcomes • Predict outcomes, test and evaluate • Understand and explore a range of commands **Practical Programming:** • Use programmable toys as programming devices • Correct errors in own programs and on a floor robot. • Use the term 'debug'	• Revisit Espresso at an unseen unit (Year Three Unit 3A) • Remind children that in order to make the digital avatars move or for things to happen they must be programmed with code or given a set of instructions. Throughout the Year 3 Units the instructions become increasingly more complex and the amount of functions you can achieve increase • Discuss that within unit 3 children will learn to make things happen in a sequence, creating simple animations and simulations. • Explore the terms sequence and simulations with the class and then complete unit 3A culminating in children producing their own apps • Trial and share the apps and introduce a simple score sheet for children to evaluate their own and others apps E.g. ratings 1-5 for: Interest, subject/theme, ease of use etc. • Unit 3B Considers 'Conditional events' where children learn to code with 'if statement's, which select different pieces of code to execute depending on what happens to other objects. This unit also considers debugging and specific error checking **Practical Programming: Use Probots to:** • Children should be given opportunities to solve problems which involve the use of programmable toys; these should be progressively more complex than work completed in Year 2 involving drawing shapes and patterns.	Espresso Coding Espresso Coding Teacher Units (Teacher - Computing Resources - Espresso Lesson Plans) Probots.

Year 3: Introduction to Scratch/ Junior				
Programming	• 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	• Predict outcomes, test and evaluate • Understand and explore a range of commands • Recognise that different sequences can achieve the same outcome • Recognise repeat in a sequence • Explore input and output forms	• Explain to the class we have been looking at Espresso Coding and writing increasingly more complex instructions and algorithms in a simple way but there are other coding programmes to explore which are more difficult or others that allow you to have more freedom in the content: Scratch (HA)/Scratch Junior(LA) and Just 2 Easy • Watch a YouTube Introductory Video for Scratch/Scratch Junior • Show the Scratch interface and explain the choice of tabs principally sound, motion and events (starting and stopping) to get going and show the 2 pages the working and editing screen and the viewing screen • Allow the children time to explore the program 'Scratch' using some of the tutorials and introductory units • Support children in saving their work • Present challenges for the class to work towards and review the different methods/solutions that different groups may offer • Begin a project allowing children to develop their own animated program using Scratch /Scratch Junior and exploring its functionality. (Perhaps groups of children could be given specific commands to develop?) • Allow sessions for children to develop, adapt and improve their pieces • Hold a screening day where each child or group of children presents their piece explaining what their character can do and how they achieved it.	Scratch Junior (App on iPads) Scratch Just2Easy You Tube.

Year 3: **Making a digital video**				
Using Technology	• 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; • use search technologies effectively, and be discerning in evaluating digital content	• Use technology to develop, organise and share information across a safe, shared platform • Use a range of resources to present work effectively • Evaluate and modify appropriately	• To conclude a topic or theme in school use MS Movie Maker or iMovie to complete a revision aid or informative video to share with another class. • Working in small groups ask the children to collect digital material for the chosen study element through: Taking digital photographs of school displays, artwork, artefacts, and pieces of work from books. Collecting illustrations and photographs through conducting internet research • Demonstrate the use of the video capability of a digital camera/iPad and allow the ch to practise videoing one another before videoing and photographing information for the final project • Download and save all digital content in an agreed area (project folder) on the school network • Transfer the collected media into Movie Maker and assemble into sequence • Demonstrate how to add subtitles, title and credits to the production • Save and share the piece • Evaluate the content, production quality and say how the piece could be improved with experience. Alternatively a group of children could use iPads to capture digital content and use iMovie to create their own material.	**Movie Maker** **Digital Cameras** **Adobe Premier Elements** **Zu3D** **Ipads** **iMovie**

Year 3: Introduction to the Schools Computer Network				
Understanding 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 • use technology safely, respectfully and responsibly;	• Know the difference between the school network and the internet • Learn about the different external and internal parts of a computer and what they do • Understand the terms input device and output device	• Mind map the children's knowledge into how they think a computer works? Ask them to draw and label a computer with all of the parts they know and review the information as a class determining the level of knowledge. • Using an internet search ask the class to try to find a picture of inside a computer and use found information to label a diagram including hard drive, power source, cooling fan, speaker, RAM, Sound and graphics cards, motherboard, memory, processor, DVD drive, keyboard, mouse, monitor. • Research simplified definitions for the terminology categorise into input device, output device and hardware. • Watch video clips from BBC web wise and PPT • Consider how when you are on your own computer or tablet you can save work to the device's memory or share photos and documents by mail and the internet, but in school we all need to share programs and files between everyone across both buildings. To do that we have a computer network. The computer network shares information within school but only beyond if we ask it to by sharing. • Look at simplified diagrams of a computer network and walk around school to look at parts of the network including the server and switch /hub cabinets. (PPT Lesson are available to support this) • Understand that the central server sends out information to all of the other computers so they can be the same. It holds all of the information so that we can go on any of the computers in school to get the information or use a program. • Explain that the schools network of computers is called **an intranet**. When we use a modem to connect to many other computers that is **the Internet**.	**Introduction to network PPT, Videos**

Year 3: E Safety and Messaging.				
Understanding Technology	• Understand the opportunities computing offers for communication and collaboration • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact	• Understand about keeping information safe and private • Begin to understand how to keep safe when sharing information online • Using email and blogs to communicate • Know how to report online problems, discuss cyberbullying • Recognise the need to choose age appropriate online sites • Discuss viruses and malware	• Illicit children's knowledge about communication using ICT. How many different forms do they know about? (Email, Skype, webcam, online chat, forums, social media, text messaging/imessages etc.) • Discuss and explore the safety considerations for using online communications. What are the problems of communicating without seeing someone? Make safety posters. • Use 'ThinkuKnow' CEOP website (8-10 Year olds) to explore and learn about safety across the range of media. • Know how to respond in event of a problem • Try a range of communication methods in school – eSchools website for chat and email, record some videos using the iPads for the class page, Set up Skype using 2 laptops/iPads.	**ESchools Email** **Thinkyouknow CEOP Website** **Video conferencing software** **Webcam** **Ipad** **Skype**
Year 3: Creating a Survey an Analyse the Results				
Data Handling	• 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 • Understand the opportunities computing offers for communication and collaboration	• Use technology to develop, organise and share information across a safe, shared platform • Use a range of resources to present work effectively • Evaluate and modify appropriately • Use data to answer questions • Use different tools to present data • Use a pre-prepared database	• Explain to the children that they are going to create a survey to find out what other people think of a particular topic. If necessary, explain what a survey is and give some examples or take a paper survey in class. • Ask the children what subjects they have concerns about or are interested in or related to a topic, theme or school life. • Discuss whether it would make a difference if others agreed with them. • Ask the children to suggest ways they could find out what other people think: in the class, in the school, across the country or around the world. • Introduce the idea of a web-based survey of opinions, exploring the key ideas of allowing people to answer anonymously and keeping individual answers confidential. • Group children together to work on shared surveys with a common theme (e.g. school food, attitudes to lessons, bullying, etc.). • Ask each group to brainstorm questions they would like to ask, perhaps using a mind-mapping technique and tools • Use survey software or program to type up the questions and distribute (in class, to parents, by email, throughout schools etc.) • Collect and analyse results • Share findings • Consider the application of real life surveys	**Eschools Website** **Excel** **2 Graph** **Survey Planet** Inspiredata Google Drive iPad Quiz App

Computing Assessment Criteria

Key	Programming	Using Technology	Understanding Technology

Year 3

- I can write programs that accomplish specific goals e.g. writing an app or programming pro-bot
- I can use sequence in programs
- I can search technologies effectively to collect digital material.
- I can use a variety of software to accomplish given goals e.g Making a digital video, creating a survey
- I can use a variety of software to present information e.g. Making a digital video, Creating a survey
- I can describe how to use technology safely and responsibly and I am aware of acceptable and unacceptable behaviour.
- I can identify a range of ways to report concerns about contact e.g. CEOP 'Thinkyouknow' website, adults in school
- I can talk about a simple computer network

Non-Negotiable Curriculum: Computing — Year 4

	Programmes of Study	Non-Negotiable Criteria	Possible Lines of Direction	Resources
Year 4: Coding				
Programming	• 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	• Create and edit procedures • Evaluate and improve programs • Use if..... • Refine programs to improve efficiency • Use repeat to simplify programs • Use simple sensing to log a change • Understand and use input and output • Experiment with variables	• For revisiting Espresso in Year 4 the starter unit maybe used to refresh children's memories and recap on prior learning • In Espresso Unit 4, Children deal with variables. Explain that a variable is something that may change. Illicit children's knowledge of variables in Mathematics and consider some simple everyday variable examples. • Ask the children what they think would be a variable if they were playing a computer game? Show or distribute a screenshot of a very simple computer game e.g. 'Pacman '– what would change on the screen – how many variables can they list? • Explain that in computing, computers use variables to count things and keep track of what is going on such as scores. Unit 4A will guide children to learn to create simple games which use a score variable. • Unit 4B Considers repetition, loops and timers. Discuss and define the terms and consider their practical applications before working through the unit. EXTENSION Children who complete Espresso with ease may like to consider reviewing the programme 'Scratch' introduced in Year 3 Children with a Scratch account can begin to follow instructions on a start-up page or begin to try some of the 'Start up Projects' online on the Scratch Educational Page (Animation, games, video sensing, interactive art etc.)	Espresso Unit 4A and 4B Scratch

Year 4: Practical Programming – Lego WeDo				
Programming	• 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 • 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 • Use technology safely, respectfully and responsibly	• Plan an algorithm to achieve a specific outcome • Step through program sequences to identify errors Break a problem into smaller parts in order to build a procedure/program • Use a range of resources for programming	LEGO® Education WeDo is a Construction Set enables students to build LEGO® models that attach to the LEGO USB Hub and then control the models using computer programs. • Before commencing the lesson ask the children who has a Lego set and ask them to bring in the instructions to look at in Computing. • Ask the children to mind map what they have learned about coding so far? Can they recall that it is giving a computer a sequence of instructions and working out the correct sequence of instructions to do the job? Explain that during this block we will be considering lLego and coding. • (Collect together a set of everyday Lego bricks and a simple set of instructions using the basic brick types for this lesson ('Pintrest' has some very early basic brick instructions for small models) and either ask ch to follow the instructions to build the model or for HA to write or draw instructions to make the model • Introduce Lego Wedo by showing a short demonstration video clip (YouTube and Lego WeDo Education Websites) introducing the fact that Lego WeDo involves following and working out instructions to build and control Lego • Introduce the 3 basic movement motors and the Lego USB connectors and open and show the software demonstrating the instructions blocks an comparing and contrasting it to existing knowledge of Scratch and Espresso. • Allow children time to work through some of the starter builds following the precise instruction and allowing children time to problem solve as appropriate. • Work through a range of build allowing for children to gain confidence, experience, and experiment with their own designs • Ask children to record their work either through photographs, video clips, writing a software review or sharing their work with the class.	**Flow all** Lego WeDo YouTube Pintrest

Year 4: **Producing Digital Music**				
Using Technology	• 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 • be discerning in evaluating digital content	• Use technology to edit and organise ideas, collaborate and share ideas to achieve an agreed outcome • Use online spaces to share and collaborate • Select appropriate resources to present work • Evaluate own work and modify accordingly • Use appropriate tools to present work	• Explain to the children that they will be working towards producing an original piece of music • Think about and elicit children's current knowledge of music and how it is made and produced. • Use **Jamendo** (online) for children to research and listen to a few different genres from simple single instrument acoustic to classical, folk, jazz to pop and electronic and discuss what is heard • Sing a simple well know song and consider the repetition an try to listen for this • Explore the basic **2 simple 2 music** • Introduce the online software – **Isle of Tune** – watch some of the premade tunes. Note how the cars drive around the circuits and initiate pre-set sounds and notes set by the producer. • Demonstrate how to set the tones/sounds of the houses/trees etc. • Allow ch to explore and share/save any developments by the end of the session • Revisit Isle of tune again allowing ch time to revisit, improve and refine their creations. Share some in class and look at sharing on the Isle of tunes website • Develop collaboration skills working together on composition ideas • Develop an awareness of how their composition can enhance work in other media discussing and finding examples of where music is used e.g. adverts, backing tracks	http://isleoftune.com/ https://www.jamendo.com/en/search&/en/search **Audacity/ 2Simple Music Toolkit** **JamStudio (online)** Garage Band/ LMMS/

Year 4: Introduction to data loggers (sound)				
Handling Data/Using Technology	• 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	• Pose questions and collect specific data • Use technology to collect, edit and organise ideas and data • collaborate and share ideas to achieve an agreed outcome • Evaluate own work and modify accordingly • Select appropriate resources to present work • Use appropriate tools to present data • Plan and create a database	• Linked to music or science • Ask the children how they normally collect the information they need? Mind map ways to collect information such as; internet research, using information texts, measuring using tools like tape measures or rulers. What if the thing you needed to measure was not physically present? • Introduce the class to a data logger and show them a picture of the device. What do they think the machine can measure? How do they know? How do they think the logger will collect sound, light and temperature? • Distribute the data loggers and ask children to locate the sensors and the on and off buttons. • Allow ch to switch on the data logger and view and experiment with the features. Look at and focus on the units of measure that each variable displays and explain the less familiar units of measure: Decibel, Lux and Degrees Celsius. • Demonstrate the use of the menu button to select the logging capabilities and to save and delete data • Allow children to experiment and practice logging and saving data followed by modelling downloading the data to a PC. • Ask children to plan a sound related investigation using the data loggers sound feature e.g. To find out how far away from a source a sound can be heard • Carry out the plan and download and analyse the data • Present and publish the findings	**Data Loggers** **Data Logging Software** **2 Graph**

Year 4: Social Networking and E Safety				
Understanding Technology	• Understand the opportunities for communication and collaboration • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact	• Develop a secure password • Keep personal information safe by hiding identity • Understand the procedures for reporting online incidents, share rules with others • Understand how to protect against viruses • Know who can view online information	• Explain that you are going to be exploring safety in the next few sessions. Allow children time to explore CEOP website (8-10 year olds) as visited in Year 3 including using the Cybercafé and follow up over a series of offline lessons with a variety of activities/scenarios: ○ Mock up a t shirt or a picture of a t shirt and on the back/front of it a name, address and telephone number: Ask children to discuss why they should **not** wear that t-shirt • Ask all children to think of a personal memorable password that they would like to have for a new program, work in partners/friendship groups to each have 10 tries to guess one another's password. What would they consider about a person when making their guesses? - Follow up with a demonstration about replacing letters and numbers or including symbols into their passwords • What might happen if you had a t shirt with 'My password is 'Fredblogs2' Explore scenarios for sharing a password and discuss ch's experiences of viruses as well as the possibility of interfering with accounts, information or money (amazon, online banking) • Give out notes to the class, some of which say everyday messages such as 'You have worked hard today, well done' and some which are unusual or contentious. How many children report they have a suspicious message? How many keep quiet? Discuss reporting incidences of concern • Watch Captain Kara and the Smart Crew eSafety presentation (20mins) or in sections (see web link)	**ESchools Website** **Email software IPad** **Thinkyouknow CEOP Website** **http://www.childnet.com/resources/the-adventures-of-kara-winston-and-the-smart-crew/watch-full-movie**

Computing Assessment Criteria

Key	Programming	Using Technology	Understanding Technology

Year 4

- I can design programs that accomplish specific goals e.g. Using SCRATCH to make a simple platform game
- I can debug programs that accomplish specific goals
- I can use more complex commands in my coding such as repetition and using various forms of input and output in programs
- I can use a variety of software to accomplish given goals e.g. producing a piece of music or collecting data
- I can design and create musical content
- I can use and combine software to collect, analyse, evaluate and present data e.g using data loggers
- I can understand the opportunities computer networks offer for communication
- I can identify a range of ways to report concerns about content and contact
- I can use technology respectfully
- I can recognise some acceptable/unacceptable behaviour.

Non-Negotiable Curriculum: Computing — Year 5

	Programmes of Study	Non-Negotiable Criteria	Possible Lines of Direction	Resources
Year 5: Advanced Coding (Scratch/Kodu)				
Programming	• 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	Children will: • recognise that problems should be broken into smaller parts in order to achieve a solution effectively; • Use if…… then…… • Sense change to begin an action; • Begin to understand the need for a variable in a program; • Change an input and observe and output; • Recognise that effective algorithms and procedures are important for achieving required outcomes; • Understand that logical reasoning enables detection and then correction of errors; • Know the difference between an algorithm and a program. • Use a variety of commands to create an algorithm; • Create codes.	Children should be given opportunities to: • Create computer games, using logical reasoning to detect and correct errors: (Scratch/Kodu). • Use algorithms to program turtle graphics to design and create digital content.	http://games.thinkingmyself.com Espresso Coding Scratch Kodu Flowol J2Code-Just2Easy site. 2Code- Purple Mash WeDo with Scratch & Sensors What is an algorithm? Car Park Algorithm: all on BBC Bitesize KS2 Computing http://www.bbc.co.uk/guides/zqrq7ty Many game ideas using scratch, complete with instruction sheets can be found here: http://www.simonhaughton.co.uk/2013/02/scratch-20-resources-and-planning.html

Year 5: Collecting, Organising, Presenting and Analysing Information				
Handling Data	• 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	Children will: • explore and use a range of data handling resources including spreadsheets; • Use a spreadsheet or database for collecting data; • Formulate questions accurately in order to solve problems; • Analyse information and interrogate data; • Search using and/or, q G; • Use data loggers for an investigation; • Create own database.	Making appropriate links to their work in other curriculum areas, children should be given opportunities to: • Use spreadsheets to present and analyse information; • Conduct searches relevant to curriculum studies using a database. • Use data loggers in areas such as Science to gather information for analysis. • Create a database of information related to a curriculum area/study	Excel Textease Studio CT: Spreadsheet 2Investigate: Database Program Simple data logging equipment and software.
Year 5: Presenting information to an audience				
Using Technology	• 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 search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content • use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact	Children will: • Use a range of technology to present information for an audience; • Combine media in order to present information effectively; • Share using a variety of tools both on and offline; • Evaluate and refine to produce effective presentations; • Use effective strategies to search with appropriate search engines; • Create own rules for using online sites; • Use resources on safety sites; • Discuss and understand online problems; • Be a responsible and respectful user of the internet; • Create strong passwords	It will be necessary to do a range of projects across the school year that incorporates a variety of different tools/software fit for purpose and audience. Children should have opportunities to: • Capture, store, retrieve and edit their own digital content: digital art, animation, film-making etc. • Use class blogs and messaging to share experiences and opinions. • Create their own online content: website/e-book etc. • Create a virtual space	Explain Everything App E-Schools (sharing and creating online content) Google Earth Microsoft Applications: publisher etc. Frames Zu3D Moviemaker iPads Inkscape/Illustrator Picasa3 Junior Photoshop Textease CT: Draw E-Schools: messaging Sketch-Up http://www.culturestreet.org.uk/activities/superactioncomicmaker/ (Comic maker)

Year 5: Creating a Wiki				
Understanding 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 • use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact	Children will: • understand that online content should not be adapted without permissions or acknowledgement; • understand the importance of evaluating online information; • understand how different devices connect to the Internet; • understand how to share and collaborate online using blogs, wikis, messaging; • identify elements on a web-page; • make good choices when they present themselves online; • know how to protect online identity; • know what is appropriate and inappropriate use of the Internet; • know how to use 'Report Abuse' button; • Understand both rights and responsibilities online.	It will be necessary to develop the children's knowledge and understanding of technology across the whole curriculum. Children should have opportunities to: • Understand the World Wide Web through examining a range of websites and web tools and how they work in different ways. • Use a wiki and contribute to a wiki. • Focus on the process of finding and evaluating information. • Use email and messaging tools appropriately.	www.searchbox.co.uk/kids.htm (search engine websites for kids) www.bingiton.com (Google and Bing results together). How does the Internet work? What makes a good web page? How does the World Wide Web work? BBC Bitesize: KS2 Computing. http://www.bbc.co.uk/education/topics/zs7s4wx E-Schools: Messaging www.swiggle.org.uk (search tool, online safety guidance)

Computing Assessment Criteria

Key	Programming	Using Technology	Understanding Technology

Year 5

- I can solve problems by decomposing code into smaller parts.
- I can design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems.
- I can use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.
- I can select a variety of software to accomplish given goals
- I can use and combine software to collect, analyse, evaluate and present data
- I can understand computer networks including the internet and how they can provide multiple services, such as the World Wide Web; and the opportunities they offer for communication e.g. write a wiki
- I know a range of ways to report concerns about content and contact.
- I can use technology safely, respectfully and responsibly.
- I can recognise acceptable/unacceptable behaviour.

Non-Negotiable Curriculum: Computing — Year 6

	Programmes of Study	Non-Negotiable Criteria	Possible Lines of Direction	Resources
Year 6: Using Touch App (iPad)				
Programming	• 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	Children will: • break problems into smaller parts to achieve a solution; • design and write programs to answer own questions; • test, evaluate and refine; • understand when a variable is needed in a program; • detect and correct errors and identify the errors in the original algorithm; • change variables to alter outcomes; • Explore other coding languages.	Children should be given opportunities to: • Create app within a coding program: espresso coding. • Create own apps linked to other curriculum areas, with opportunities to research, design, create, test, evaluate and refine before finishing and publishing. For example: a quiz linked to Science or digital fact file content app linked to history.	Espresso Coding Touch App Creator: on iPads iPads Google Drive Drop Box for App sharing. App Inventor/Touch Develop (See Rising Stars).
Year 6: Investigating with Data Logging				
Handling Data	• 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. • design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts	**Children will:** • select the most appropriate tool for the task; • understand why information is presented in different ways; • set own challenges; • use formula in a spreadsheet to present and analyse information; • present the results appropriately; • critically evaluate data; • use programming skills to take own readings to help solve problems; • investigate accuracy of data sets; • Understanding different processes involved in handling data: generate, process, interpret & store.	Making appropriate links to their work in other curriculum areas, children should be given opportunities to: • Pose own questions/investigations within maths/science/geography etc. and use technology to gather evidence and investigate possible answers/solutions to problems.	Data Logging equipment and software; Excel

Year 6: Creating own Web and digital content				
Using Technology	• 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 search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content • use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	Children will: • identify the purpose of a task and select the most appropriate tool/s for effectiveness; • Use sound/images/text/transitions/ • hyperlinks/html code effectively for presenting work; • Store information online where it can be shared with others; • Evaluate effectiveness of own & others work; • Create an online space and create links; • Use search engines effectively to search; • Behave responsibly and respectfully online; • Understand how to use social networking sites appropriately; • Know how to protect oneself online; • Understand how information sharing carries a responsibility; • Recognise the risks and rewards when using the Internet; • Respect the privacy of themselves & others.	This work could be incorporated into the app creation work as part of the programming curriculum. As all of the key non-negotiables listed could be developed through the children's creation of their own app. Children should be given opportunities to: • Create their own web and digital content to include in apps linked to other curriculum areas. Additionally children should be given a wide range of cross-curricular projects to do to enable them to use and choose technology appropriately. Children could: • Create an interactive presentation on e-safety for KS2 annual assembly.	Microsoft Applications: publisher etc. Frames Zu3D Moviemaker iPads Touch App Creator Drop box: sharing Google Docs: sharing E Schools: sharing

Year 6: Wider understanding of the Internet and the World Wide Web				
Understanding 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 • Use technology safely, respectfully and responsibly; recognise acceptable/ unacceptable behaviour; identify a range of ways to report concerns about content and contact.	Children will: • recognise and describe the services that are part of the Internet; www, email, social networking etc.; • describe how search results are selected & ranked. • use email attachments, upload documents to shared space in order to understand protocols; • share and collaborate using a range of online resources: forums, messaging, e-portfolios, apps etc.; • choose and evaluate appropriate tools; • discuss and understand online problems such as cyberbullying.	It will be necessary to develop the children's knowledge and understanding of technology across the whole curriculum. Children should have opportunities to: • compare searches and understand how key words work, how hits occur and reliability of information; • use a range of services provided by the Internet and understand the difference between the www and the Internet; • develop their awareness and use of the moral compass for using materials. • Use email and messaging tools appropriately.	http://www.bing-vs-google.com http://internet-map.net http://allaboutexplorers.com http://www.mediasmart.org.uk Many slideshows and materials to support this at: http://www.simonhaughton.co.uk/ict-lessons/ E-Schools: Messaging www.swiggle.org.uk (search tool, online safety guidance).

Computing Assessment Criteria

Key	Programming	Using Technology	Understanding Technology

Year 6

- I can use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- I can use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.
- I appreciate how results are selected and ranked when using search technologies and can be discerning in evaluating digital content.
- I can select, use and combine internet services
- I can select and use and combine a variety of software on a range of digital devices to accomplish given goals
- I understand the opportunities computer networks offer for communication
- I can identify a range of ways to report concerns about content and contact
- I recognise acceptable/unacceptable behaviour