HORNCASTLE PRIMARY SCHOOL
Subject Progression – Computing

Purpose & Aims	A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with Mathematics, Science, and Design and Technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. Pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that pupils become digitally literate – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world. The National Curriculum for computing aims to ensure that all pupils: i) can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation; ii) can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems; iii) can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems and iv) are responsible, competent, confident and creative users of information and communication technology.
EYFS	Learning about technology starts from birth because it's the way the world works today. Technology is an integral part of all young children's environment and world. They are surrounded by technology just as they are surrounded by language, print and numbers. In the home, technology includes remote controls for television, DVDs and sound systems, toys that have buttons and buzzers, mobile phones, washing machines, microwave ovens and other machines that require programming, and of course, computers and mobile devices such as iPads. Outside the home, children are also immersed in the technological world: they see automatic doors, cash machines, bar code scanners, digital tills and weighing machines, and security cameras. Technology is something children are going to grow up with, learn about and master, and use as a tool to increase their understanding in all areas of learning. Many activities in the early years revolve around children developing an understanding of their environment. Settings encourage children to explore, observe, solve problems, predict, discuss and consider. ICT resources can provide tools for using these skills as well as being examined in their own right, with computers not the only resources. ICT equipment added to role-play reflects the real world, builds on children's experiences and allows them opportunities to understand how, why, when and where different forms of technology are used in everyday life. Early experiences form a foundation upon which KS1 and KS2 can build and the current early learning goals have specific objectives relating to ICT. By the end of the Foundation Stage most children will: • Show an interest in ICT • Know how to operate simple equipment • Complete a simple program on the computer and / or perform simple functions on ICT equipment • Find out about and identify the uses of everyday technology and use information and communication toys to support their learning

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Focus Areas	**E-Safety** **Shaping the Digital World** **Communicating in the Digital World** **Exploring the Digital World**	**E-Safety** **Shaping the Digital World** **Communicating in the Digital World** **Exploring the Digital World**	**E-Safety** **Shaping the Digital World** **Communicating in the Digital World** **Exploring the Digital World**	**E-Safety** **Shaping the Digital World** **Communicating in the Digital World** **Exploring the Digital World**	**E-Safety** **Shaping the Digital World** **Communicating in the Digital World** **Exploring the Digital World**	**E-Safety** **Shaping the Digital World** **Communicating in the Digital World** **Exploring the Digital World**
E-Safety (Objectives in purple come from RSE curriculum)	Identify what is personal information and discuss sharing personal information. Create class email showing what information is personal and allowed and what is not. Use VLE blogging/social media to see how information can be viewed by others. C/C RSE Open and close applications Create class rules including seeking help from adult if unsure. C/C RSE	Identify some risks presented by new technologies inside and outside school (e.g. online games, mobile phone texting and cyber-bullying). C/C RSE Discuss sensible people to talk to about risks – parents, teacher, “real” friend. Not “online” adult/friend. Identify SMART rules: Safe/Meeting/Accepting/Reliable/Tell. C/C RSE Create class rules Use email/blogging/social media on VLE to model how we respect other people’s work/feelings/ opinions and that this communication can be recorded.	Identify SMART rules: Safe/Meeting/Accepting/Reliable/Tell. Create a poster/presentation to highlight SMART rules. Discuss what to do if content is inappropriate or upsetting (e.g. parent/teacher/trusted adult) know who to report to and talk to. C/C RSE Use VLE whistle blowing system to highlight inappropriate usage. Create class rules Identify what appropriate and inappropriate behaviour is and cyberbullying Seek help from an adult when they see something that is upsetting or worrying	Identify trusted adult Understand the Internet contains fact, fiction and opinion and begin to distinguish between them. C/C RSE Know that the aim of many sites is to sell something or gain personal information and can be linked to from other sites. C/C RSE Create class rules Create blog or forum on VLE to show impact of digital footprint Be aware that taking text or images from some sites may be stealing other people’s work. Know when an email should not be opened or messages ignored. C/C RSE	Identify trusted adult Demonstrate safe practice when selecting images or content for uploading to an online space. Create class rules Understand the need for privacy settings on any social networking sites (and that those privacy settings may not be observed by online ‘friends’ who can use/ share/download your images /content). C/C RSE	Identify trusted adult Understand some malicious adults use the internet to make contact and “groom” young children. C/C RSE Create class rules Know how to report any suspicions (Think You Know REPORT ABUSE page). Discuss scenarios involving online risk
Shaping the Digital World	Use a mouse, pen or finger to move and place items accurately in paint software. Use a digital microscope or tablet/ visualiser to look at objects closely. C/C Science Create/follow instructions (algorithms) to navigate programmable toys (and other children) around a course. C/C Maths Explore outcomes when individual buttons are pressed on a robot. C/C Maths	Use a mouse, pen or finger to move and place items accurately on a screen to explore a simulation. Make choices in an adventure game or simulation. Input algorithms into a program to create a simple shape on screen or to control a device. Make predictions when programming devices (actual or on screen), estimating distances and turns. C/C Maths Have experiences of controlling relevant devices such as Google Home, Alexa, iPads	Use a spreadsheet to explore simple patterns (e.g. in a number square of some kind). C/C Maths Use online games (safe content). Discuss what makes a good game. Solve open ended problems with a floor robot, screen turtle and other programmable devices. C/C Maths Use Logo programming algorithms (pen up/pen down, repeat commands etc.) to create shapes/patterns. Test to detect errors and modify procedures or sequences. Make a pattern by breaking the instructions into smaller parts (decomposing). For example, create a procedure (e.g. for a square in Logo) then create a sequence that draws the procedure, rotates x degrees and draws another square and so on. C/C Maths	Discuss ways simulations are used to help us (e.g. simulations for flight to teach pilots, driving, weather patterns etc.). Discuss their use of ICT simulations and compare with reality. Use a spreadsheet to record data and produce graphs. C/C Maths Use some basic features to design and write a program to change or move a character in an application (e.g. Scratch - see 'Getting Started' guide). Create simple flow diagrams to control physical devices (real or screen simulations) using outputs only (e.g. Flowol, Junior Control Insight, CoCo 2 or Go).	Enter labels and numbers into a spreadsheet. Enter formulae into a spreadsheet and modify the data, (simple calculations + - × ÷). C/C Maths Identify and enter the correct formulae into cells, modify the data, make predictions of changes and test them. C/C Maths Write control sequences which use outputs and inputs (using if… then… type commands) to control events in response to conditions. Use sub routines to decompose the problem into smaller parts (e.g. Use Flowol, CoCo 2, Junior Control Insight or Go software). Explain the logical steps of the flow diagram in the design process.	Change data and formulae in a spreadsheet to answer 'what if..?' questions and check predictions. C/C Maths Use a spreadsheet to draw a graph to help answer specific questions. C/C Maths Use more advanced formulae (SUM, average, mode etc.) C/C Maths Explore a range of ICT games (including multi-player) in a safe environment (e.g. Pora Ora). Evaluate different ICT games and design their own, writing rules and objectives. Analyse the impact of games in our society. Design own game, simulation or app and use a programming tool to create it for use by others (e.g. Scratch, Kodu and Appshed - apps don't have to be published).

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Communicating in the Digital World	Become familiar and correct use of the keyboard – spacebar, backspace, return, shift (for capital letters - not caps lock), return. Take a picture with a camera/tablet With support save and retrieve documents in own folder. Write simple sentence format text (size, font, colour). With support, add text, picture, blog on VLE.	Create and save worked documents in own folder. Locate the saved file or image, re-use and resave. Use sound, images and text in simple presentation software. Edit font size, style and colour. Take a picture and save in own folder or upload to VLE. Add text, picture, blog on VLE. Add captions to photographs and graphics in publisher or PowerPoint (or similar program). Use templates and a range of tools in Paint software.	Use different font sizes, colours and effects to communicate meaning for a given audience. Use Word to insert and edit simple tables. C/C Maths In Word, use layout, format, graphics and illustrations for different purposes or audiences. C/C English Use appropriate editing tools to ensure their work is clear and error free (using tools such as spell checker, thesaurus, find and replace). C/C English Take or select/import images from devices, packages or other sources and prepare for use i.e. crop, resize, edit). Log on to email account in VLE (with support), open emails, create & send appropriate replies. Contribute to discussion forums, blogs and surveys on VLE.	Recognise key features of layout and use design features such as text boxes, columns and borders. C/C English Use page setup to select different page sizes and orientations. Use cut, copy and paste to refine and reorder content. Select suitable text, sounds and images from electronic resources (e.g. Espresso or websites) and use it appropriately in their own work. Create a range of hyperlinks to produce an interactive presentation. Log on to email account, open emails, create & send appropriate replies, attach files & create address book. Create in VLE: own pages, discussion forum, blogs and surveys for other pupils to respond to. Begin to use video to communicate as a class (e.g. Skype or Face Time with another school).	Develop and use criteria to evaluate the design and layout when evaluating a range of web sites, pages on VLE, online resources and presentations. Make effective use of transitions and animations in presentations. Consider the effect on the audience and the appropriateness of such devices. Through peer and self-evaluation children evaluate their design and make improvements. Use and refine their skills while independently creating, sending and responding to emails, blogs and forums in VLE/social media. As a class or group make use of video technology to exchange ideas and collaborate on projects (e.g. Skype with webcams or Face Time with iPads). Enhance a presentation by acquiring, storing, and combining images from different sources. Make use of transitions and special effects in video editing software and understand the effect they have on the audience. Independently select and use a variety of appropriate devices to record sounds. Upload and download projects (e.g. Learning Platform). Create their own sounds and compositions to add to their presentations/films/images/ photos. Use ICT to produce music for a specific purpose, considering the impact on the audience (e.g. length, style, genre etc.).	Independently select and import text, images, video and sounds (including their own) using a range of digital devices and prepare them for presentation using ICT to create their own effects. Develop the use of hyperlinks to produce interactive presentations or websites. Understand how pages link together and recognise the need for clarity. Produce a diagram to show the links between pages. Through peer and self-evaluation children evaluate their design and make improvements. Produce formal or informal messages appropriate to the task or to solve problems (requesting information, sharing data etc.). Combine stills, video and sound using a video editing package. Export movies in a variety of formats and use them in multimedia presentations. Plan and create a short animated sequence to communicate an idea, using a storyboard and timeline. C/C English Independently select, edit and combine sound files. Manipulate the sounds (such as reversing sounds, adding echo, altering speed etc. and using them appropriately considering audience and purpose.

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Exploring the Digital World	With support use buttons, menus and hyperlinks to navigate web sites, Learning Platform or other areas of stored information (e.g. Espresso, Education city, DBPrimary). Access different information using a range of equipment to research a topic (sound recorders, website, TV, YouTube videos etc)	Use buttons, menus and hyperlinks to navigate web sites, Learning Platform or other areas of stored information. Enter text into a search engine and URL's in the address bar to find specific given web sites. Enter text (or simple key question) into a safe search engines to find information on a given topic (Google, Woodlands website, Cbeebies) Start to evaluate whether or not the information is useful.	Collect appropriate information, enter it into a database and use the database to answer simple questions. C/C Maths	Investigate changes in the environment using a datalogging device to capture measurements (sound, temperature, light) continuously over time. C/C Science Generate and compare different charts and graphs (using spreadsheet) and understand that different graphs are used for different purposes. C/C Maths Discuss different graphs and their uses. C/C Maths Determine the data needed to solve a specific problem; organise, present, analyse and interpret the data in tables, diagrams, tally charts, pictograms and bar charts, using ICT where appropriate. C/C Maths	Use the pre-programming features of data logging software and devices to set up a specific data capture, perhaps overnight. C/C Science Use graphical information to answer questions and solve simple problems. C/C Maths Check for accuracy by checking data, using different views, search tools, and graphing. Identify and correct inaccuracies. C/C Maths Select an appropriate search engine to find information related to their topic. Develop skills to question where web content might originate and understand that this gives clues to its authenticity/reliability (by looking at web address, author, linked pages etc.).	Use a range of sensors (temperature, light, sound, heart rate monitors, light gates) to support scientific investigations. C/C Science Construct, refine and interpret frequency tables, bar charts with grouped discrete data and line graphs; interpret pie charts. C/C Maths Design questions using key words, to search a large pre-prepared database. Use complex searches (and/or, is greater/less than) to search data when looking for relationships and patterns in data. Develop strategies for finding information checking for bias and different viewpoints (using different keywords, cross checking with other sources etc.). Discuss how internet search engines find, store and rank data. Discuss issues of copyright and downloading material Game cheats, music, images. Reference sources used in their work.