Netherfield Computing KS2 Curriculum

We want the children at Netherfield Primary School to leave us with a knowledge and understanding of computing that will prepare them for an ever-changing digital landscape.

At Netherfield, we follow the National Curriculum for computing. We have built a broad and ambitious curriculum for computing with a wide breadth of knowledge and skills taught from the Early Years to the end of Key Stage Two drawing from advice and guidance from the National Centre for Computing, Computing at School, the National College and Barefoot Computing. All year groups cover a range of computing strands to ensures that they are confident and competent using a range of technology and software for different purposes.

The curriculum helps children understand how computing is used not just in school but in the wider world too. We want the children to have the skills and understanding they need to become, respectful, confident and competent computational thinkers in the digital world we now live in.

The Computing Curriculum is split into three strands:

- Computer Science
- Information Technology
- Digital Literacy

Within Computer Science we focus on how computers work and the theories and concepts around this.

Information Technology is divided into four units including text and images, motion and sound, data and looking at the history of computing.

Digital Literacy is also divided into 4 units including, e-safety, technology in our lives, using the internet and communication. This strand is woven through-out their lessons and when applicable

Within Key Stage One Computing is blocks are taught throughout the year and in Key Stage Two, children are taught computing weekly. Computing is taught using a range of hardware devices, software and unplugged activities. It is taught cross-curricular where applicable, linking to topics being taught. Unplugged activities are evidenced in their computing folders and other work is evidenced in the children's own digital files.

	Computer Science	Information Technology				Digital Literacy			
	How computers work (programming)	Text and Images	Sound and Motion	Data	History	e-safety	Technology in Our Lives	Using the internet	Communicating
Year 6	Scratch – Create a game • Use logical reasoning to create a solution for a problem and write an algorithm for it • Understand that you can have more than one solution for the same problem • Use **variables** (to store data e.g. a score) and various form of inputs and outputs e.g create timing for events, speech bubbles, • Use **sequence, selection and repetition** to create a game in Scratch • Plan different scenarios using 'what if' questions and conditional statements e.g sprite becomes invisible or hides • Use the correct vocabulary in relation to current and previous learning	TEXT AND IMAGES -3D Modelling tinkercad • To recognise and understand that you can work in 3 dimensions on computers • To identify and modify 3D objects • To combine 3D models • To create a 3D model for a given purpose • To plan, design and create their own 3D model DATA - Spreadsheets • Create a spreadsheet for a specific purpose • Use keyboard shortcuts and functions to input data on spreadsheets • add data to an existing database • Collect data and input it into a formula using spreadsheets • Use spreadsheets to answer questions and solve problems • Know and demonstrate how to interpret and compare data SOUND AND MOTION (iMove or Windows 10 video editor) • To explain what makes video's effective • To use digital devices to record • Identify features on a given video device • Plan and record a video • Edit video and evaluate Use key vocabulary to demonstrate knowledge and understanding in this strand History Focus: Alan Turning and Codebreaking during WWII				Computer Systems and Networks – Communication • Recognise that data is transferred using agreed methods • Explain that internet devices have addresses • Describe how computers use addresses to access websites • Identify and explain the main parts of a data packet • Explain that data is transferred over networks in packets • Recognise how to access shared files stored online • Identify different ways of working together online • Recognise that working together on the internet can be public or private E-Safety (Taught throughout the year) • Discuss the positive and negative impacts of the use of ICT in their own lives and those of their peers and family e.g. screen time, discussing what they are doing online • Know that content put online is difficult to remove. • Understand they should not publish other people's pictures or tag them on the internet without permission - link back to copyright • Suggest different ways that they could deal with Cyberbullying' • Identify and discuss online situations they may need to be careful in and why • Explain what a digital footprint is and discuss what their own digital footprint is like and what impact this can have on them in the future			
Year 5	Scratch – Create a quiz • Create a consequence to an action using the **Selection** Command e.g. If ….... then ….... when writing an algorithm • Use a variable to increase the value of a score • Test an algorithm and use logical reasoning to spot errors and debug • Follow an algorithm and predict the outputs for the program • Change inputs to create different outputs • Use the correct vocabulary in relation to current and previous learning	TEXT AND IMAGES (Webpage Developer) • To look at the structure of websites • To understand what a webpage • To understand copyright and what it means • To create their own webpage • Explain and discuss software chosen and why Text and Images – Vector Drawings (Google Drawing) and Vectr - Free Online Vector Graphics Editor • To identify drawing tools and how they can produce different outcomes • To combine shapes to create a vector drawing • To create effects using different drawing tools • To understand that vector drawings consist of layers • To group and duplicate drawings • To create their own vector drawing DATA – Excel • Discuss the different ways that data can be organised e.g. branching diagrams, data loggers • Examine how data can be stored and viewed • Use given databases to answer questions and solve problems • Know and demonstrate how to interpret and compare data • Recognise inaccurate data. • Suggests ways to change the table such as change cells, change layout Use key vocabulary to demonstrate knowledge and understanding in this strand History Focus – Tim Berners-Lee inventor of the World Wide Web				Computer Systems and Networks – Sharing Information • Understand that you make your own choices when using technology e.g. comments • Explain how computer systems are built, describe their features and explain how they communicate with other devices • Understand how search results are selected and ranked e.g. websites order • Compare and analyse information online looking for bias information, fake news, authentic information – How could they check/cross reference it e.g. books • 'Cite' a website where they have found information E-Safety (Taught throughout the year) • Know how to report cyberbullying • Understand the potential risk of providing personal information online. • Know what an 'alias' is and when you would use them online • Know and explain the rules for creating a strong password • Understand the words 'plagiarism' and 'citation'			

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Year 4	**Programming Turtle Logo ONLINE** • Write an algorithm to draw letters and regular polygons – • Use angle commands to draw an arc and then a circle. • To predict the outcome of a given code • To modify a given code to create a given outcome **Scratch – Create a game** • Add to a sequence of existing commands • Use a variable to create a scoring system using Scratch • Add features to a Sprite • Use **repetition** to create an effect • Predict accurately what will happen and why (Logical reasoning) • Keep testing a program and recognise when you need to debug it Use the correct vocabulary in relation to current and previous learning	**TEXT AND IMAGES (PowerPoint) – pixlr.com Check Ash** • Insert pictures into text and format and edit to create an effect • Change the orientation of the page and the size of the page. • Use photo editing software to crop photos and add effects • Identify how images have been altered and discuss how it makes people feel **DATA – Data Loggers (Need to buy)** • Use a given data set to answer questions • Collect data using data loggers and analyse data • Recognise inaccurate data. **SOUND AND MOTION –Sound - Audacity** • Record, create and edit sounds. Change recorded sounds, volume, duration and pauses. • Audio Editing Create a Podcast Use key vocabulary to demonstrate knowledge and understanding in this strand **History Focus: The history of computer gaming**	**Computer Systems and Networks – The Internet** • Understand how computer networks are connected and communicate with other networks • To understand why networks should be protected • Understand how networks connect and form the internet. • Know that the internet contains fact, fiction and opinion and understand the difference • Identify which keywords will help them search for information. **E-Safety (Taught throughout the year)** • Explain what information shouldn't be shared online • Explain how people may be hurt by other people's comments • Explain how to respond to other people's comments • Show understanding of age ratings relating to games, websites and adverts • Be able to discuss the risks of using technology and discuss how to minimise those risks
Year 3	**Programming Turtle LOGO Online** • Write algorithms using more complex commands (angles) • Plan and enter a sequence of commands to create a specific outcome e.g. regular shape • Use repeat command when drawing certain polygons and patterns **Scratch – Create sound and motion** • Understand that sprites are controlled by the commands I choose • Create a program following a design • Create a sequence of commands that start in different ways • Order a sequence of commands including sound • Debug programmes and correct your mistakes Use the correct vocabulary in relation to current and previous learning	**TEXT AND IMAGES** • Use a range of software to present data and information – Word, PowerPoint, Excel • Design and create content to present information • Use appropriate keyboard commands to amend text to present e.g. font sizes, effects, align left, right, centre, text boxes and bullet points • Evaluate work, making amendments. **DATA -Branching Databases (Unplugged)** • To understand what a branching data base is • To answer questions • To understand what attributes are and use them to group information • To create their own branching database **SOUND AND MOTION – Animation with pictures (book creator)** • Create a Comic Book • Draw and create a flip book • Explain how a flip books works Use key vocabulary to demonstrate knowledge and understanding in this strand **History Focus - Animation before Computers**	**Computer Systems and Networks – Connecting Computers** • Understand how digital devices work e.g input, output, processes • Understand the parts of digital devices • Understand how computer networks are connected and provide multiple services • Search for a specific website **E-Safety (Taught throughout the year)** Use technology respectfully and responsibly • Understand how to get help in different ways e.g. parents, school, block buttons • Use technology respectfully and responsibly Use keywords to search for information.

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Year 2	**Bee Bot App.** • Write commands in the correct order • Know and explain what an algorithm is, test them and debug simple errors • Understand that programmes follow a precise set of instructions • Plan and enter a series of simple instructions (left, right, forwards, backwards, rotate - To move the Bee Bot • Predict what will happen when programming (logical thinking) **Scratch Jr** • To predict the outcome of a sequence or algorithm • To create a program from a pre-given design • To modify a pre-given design e.g. change the colour of the sprite and move it using motion commands • Create a simple algorithm using Scratch Jnr and start the algorithm • Use the correct vocabulary in relation to current and previous learning	TEXT AND IMAGES – Microsoft Word • Create digital content • Retrieve and save digital content – save in file and open and edit and document in file - independently • Recognise which devices can take a photo • Understand how to take a good photo e.g. lighting, landscape or portrait • Edit a photo Data – (Unplugged) • Create a graph both unplugged • Record and represent data in tally • Present data in different ways - Pictogram SOUND AND MOTION – (Music Lab Chrome) • Music making apps – record sounds and edit sounds • Use key vocabulary to demonstrate knowledge and understanding in this strand History Focus: Bill Gates Founder of Microsoft				Computer Systems and Network - Information Technology Around Us • Understand what IT is. • Understand IT which is used in school and in the wider world • Know different forms of IT – laptops, cameras, card machines, pedestrian crossing • Understand how IT devices work together • Know different forms of communication e.g. emails, chatrooms • Explain what they like and dislike about websites • Use websites to complete simple search to find information • Use technology safely and respectfully following school rules • Explain how to search safely online • Understand what unkind behaviour is when online • Know and explain what to do if someone is being unkind to them online • Understand that pop ups are advertisements which they should ignore them.			
Year 1	**Computer Science Unplugged - Beebots** • Follow a set of instructions • Verbally give a set of instructions • Write step by step simple instructions e.g. how to make a sandwich • Explore what happens when buttons are pressed on a digital device e.g. a bee bot • Direct a bee-bot to a toy using forwards, backwards, right turn, left turn • Know what an algorithm is • Check commands for a mistake and debug if necessary **Computer Science -Scratch Jr** • To find and use commands to move a sprite • To understand what the blocks do • Join blocks together and use 'START' block • Use blocks with numbers e.g. make it move more steps • Create a backdrop • Use the correct vocabulary in relation to current and previous learning	**Paint** • Create digital content – paint program. Use various tools to add detail e.g. brushes, pens, shapes and stamps etc • Become familiar with keys on a laptop keyboard e.g. typing • Become familiar with keys on a laptop keyboard e.g. typing • Understand the different keys on a keyboard including the backspace key, and Caps Lock • To understand what the Cursor does on the computer screen • To explore different fonts when writing their name • Store digital content – save paint work and writing in word in a file DATA • Data – Label and group objects • Data - Look at graphs on the IWB and discuss what it shows. • Use key vocabulary to demonstrate knowledge and understanding in this strand				Computer Systems and Network - Technology in our Classroom • Understand what the word technology means • Understand the different parts of the computer e.g. power button, mouse, keys • Use technology safely following school rules • Understand the difference between 'online' and 'offline' • Explain how to keep personal information safe when online • Understand different ways of communication online. • Use a password to connect to the school server • Discuss what websites are and look at a range of websites • Know who to talk to if something/someone makes them feel unsafe			
EYFS Computing is embedded in the 7 areas of learning	• Use digital devices in role play e.g. mobile phones, laptops, • Follow simple instructions given to them • To know how to turn a laptop, tablet or other digital devises on	• Recognises different purposes for using technology in school and at home e.g. tills, microwaves • Recognises that the Internet can be used to play and learn • Know the difference between text, image and sound when using ICT. • Move things on an Interactive Whiteboard				• Show sensitivity towards others and their feelings • Talk about how they feel and how others feel • Understand that 'unacceptable behaviour' has a consequence and can impact on others • Know the importance of keeping safe • Understand what personal information is and talk about it • Understand that electrical equipment should be looked after and is easily broken • Understand basic electrical safety (water around electrical items, fingers in sockets etc.)			