St Mary's Catholic Junior School
Year 6
Computing Long Term Plan

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Bletchley Park	Intro to Python	Big Data 1	History of Computers	Big Data 2	Inventing a Product
Online Safety (6 lessons)					

Curriculum Document		
Digital Literacy	**Information Technology**	**Computer Science**
• Understanding the importance of secure passwords and how to create them, along with two-step authentication • Using search engines safely and effectively • Recognising that updated software can help to prevent data corruption and hacking • Considering their digital footprint and online reputation and future implications they may have • Learning about how to collect evidence and report online bullying concerns	Using software • Using logical thinking to explore software independently, iterating ideas and testing continuously • Using search and word processing skills to create a presentation • Planning, recording and editing a radio play • Creating and editing sound recordings for a specific purpose • Creating and editing videos, adding multiple elements: music, voiceover, sound, text and transitions to create a video advert • Using design software TinkerCAD to design a product • Creating a website with embedded links and multiple pages Using email and the internet	Hardware • Learning about the history of computers and how they have evolved over time • Using the understanding of historic computers to design a computer of the future • Understanding and identifying barcodes, QR codes and RFID • Identifying devices and applications that can scan or read barcodes, QR codes and RFID • Acknowledging that corruption can happen within data during transfer (for example when downloading, installing, copying and updating files) Networks and data representation • Understanding that computer networks provide multiple services

	• Understanding how search engines work Using Data • Understanding how barcodes, QR codes and RFID work • Gathering and analysing data in real time • Creating formulas and sorting data within spreadsheets Wider use of technology • Learning about the Internet of Things and how it has led to 'big data'. Learning how 'big data' can be used to solve a problem or improve efficiency	Computational thinking • Decomposing a program into an algorithm • Using past experiences to help solve new problems • Writing increasingly complex algorithms for a purpose Programming • Debugging quickly and effectively to make a program more efficient • Remixing existing code to explore a Problem • Using and adapting nested loops • Programming using the language Python • Changing a program to personalise it • Evaluating code to understand its purpose • Predicting code and adapting it to a chosen purpose Altering a website's code to create changes

CURRICULUM ENTITLEMENT			
	Key Computing Knowledge	**Vocabulary**		**Assessment Criteria – 'Can I...? statements'**

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Online Safety	• To describe issues online that give us negative feelings and know ways to get help • To think about the impact and consequences of sharing online • To know how to create a positive online reputation • To be able to describe how to capture bullying content as evidence • To manage personal passwords effectively • To be aware of strategies to help be protected online	Anonymity Antivirus Biometrics Block Block and report Consent Copy Digital footprint Digital personality Financial information Hacking Inappropriate Malware Online Online bullying Online reputation Password Paste	Personal information Personality Phishing Privacy settings Private Reliable source Report Reputation Respect Scammers Screen grab Screenshot Secure Settings Software updates Two factor authentication URL Username	• Can I show the ability to discuss a range of issues online that can leave pupils feeling sad, frightened, worried or uncomfortable and can describe numerous ways to get help? • Can I explain how sharing online can have both positive and negative impacts? Being aware of how to seek consent from others before sharing material online and can describe how content can still be shared online even if it is set to private. • Can I explain what a 'digital reputation' is and what it can consist of? • Can I show that I understand the importance of capturing evidence of online bullying and can demonstrate some of these methods on the devices used at school? • Can I describe ways to manage passwords and strategies to add extra security such as two factor authentication? Can I also explain what to do if passwords are shared, lost, or stolen? • Can I describe strategies to identify scams? Can I explain ways to increase their privacy settings and understand why it is important to keep their software updated?
Bletchley Park	• To understand that there are lots of different types of secret codes • To understand the importance of having a secure password • To understand the importance of Bletchley	Acrostic Code Brute Force Hacking Caesar cipher Chip and pin system Cipher Cipher code Code Combination	Nth Letter Cipher Password Pig Latin Pigpen cipher Present Scrambled Secret Secure	• Can I explain that codes can be used for a number of different reasons and decoding messages? • Can I explain how to ensure a password is secure and how this works? • Can I create a simple poster with information about Bletchley Park including the need to build electronic thinking machines to solve cipher codes? • Can I explain the importance of historical figures and their contribution towards computer science?

	Park to the World War II war effort • To understand about some of the historical figures that contributed to technological advances in computing • To research and present information about historical figures in computing	Contribute Convince Date shift cipher Discovery Hero Invention	Technological advancement Trial and error	• Can I present information about an historical figure in an interesting and engaging manner?
Intro to Python	• To tinker • To understand nested loops • To understand basic Python commands • To use loops when programming • To understand the use of random numbers	Algorithm Code Command Design Import Indentation Input Instructions Loop Output Patterns Random Remix Repeat Shape(s)		• Can I test and change ideas throughout the lesson and explaining what my program does? • Can I use nested loops in their designs, explaining why they need two repeats? • Can I alter the house drawing using Python commands; using comments to show a level of understanding around what their code does? • Can I use loops in Python and explaining what the parts of a loop do? • Can I recognise that computers can choose random numbers; decomposing the program into an algorithm and modifying a program to personalise it?
Big Data 1	• To identify how barcodes and QR codes work • To know how infrared waves transmit data • To recognise the uses of RFID	Algorithms Barcode Barcodes Binary Boolean Brand Chips Commuter Contactless	QR code(s) QR scanner Radio waves RFID Signal Systems/data analyst Transmission Wireless	• Can I show a firm understanding of why barcodes and QR codes were created? Can I show an ability to create (and scan) my own QR code using a QR code generator website? • Can I explain how infrared can be used to transmit a Boolean type signal? • Can I explain how RFID works, recall a use of RFID chips, type formulas into spreadsheets?

	• To know how encoding keeps data safe • To gather and analyse data in real time • To analyse and evaluate data	Data Encrypted Infrared MagicBand Privacy Proximity		• Can I take real time data and enter it effectively into a spreadsheet? Can I present the data collected as an answer to a question (Which ride is the best choice for a FastPass?)? Recognising the value of analysing real time data. • Can I recall how RFID can be used in data transfer and help to solve data challenges in transportation and logistics? Can I sort data within an Excel spreadsheet?
History of Computers	• To tinker with sound • To record, edit and add sound effects to a radio play • To understand how computers have changed and the impact this has had on the modern world • To research one of the computers that changed the world and present information about it to the class • To design a computer of the future	Background noise Byte(s) Computer Devices File FX Gigabyte(s) Graphics Hard disk drive Hard drive Hardware Kilobytes Megabyte Memory storage Mouse Operating system	Overlay Play Processor Radio play RAM Raspberry Pi Record Reverb ROM Script Smartphone Sound Sound clip Sound effect(s) Terrabytes Touch screen Track Trackpad Trailer	• Can I explain how to record sounds and add in sound effects over the top? • Can I produce a simple radio play with some special effects and simple edits which demonstrates an understanding of how to use the software? • Can I create a document which includes correct date information and facts about the computers and how they made a difference? • Can I demonstrate a clear understanding of a device and how it affected modern computers, including well researched information with an understanding of the reliability of their sources? • Can I describe all of the features that we would expect a computer to have including RAM, ROM, hard drive and processor, but of a higher specification than currently available?
Big Data 2	• To explain how data can be safely transferred • To investigate the data usage of online activities	Big Data Bluetooth Corrupted Data Energy GPS Improve	SIM Simulation Smart city Smart school Stop motion Threat WiFi	• Can I recognize that data can become corrupted within a network and that data sent in packets is more robust, as well as identifying the need to update devices and software? • Can I recognise differences between mobile data and WiFi and using a spreadsheet to compare and identify high-use data activities and low-use data activities?

	• To identify how data analysis can improve city life • To design a system for turning a school into a smart school • To present ideas for turning a school into a smart school	Infrared Internet of Things Personal Privacy QR Code(s) Revolution RFID	Wireless	• Can I make links between the Internet of Things and Big Data and giving a basic example of how data analysis/analytics can lead to improvement in town planning? • Can I explain ways that Big Data or IoT principles could be used to solve a problem or improve efficiency within the school, preparing a presentation about their idea, considering the privacy of some data? • Can I present my ideas about how Big Data/IoT can improve the school and providing feedback to others on their presentations?
Inventing a Product	• To design an electronic product • To code and debug a program • To use CAD to design a product • To create a website • To create and edit a video • To understand the techniques used in advertising a product	Adapt Advert Advertisement Algorithm Bugs Code Coding Debugging Design Edit Electronic Evaluate Facts Image rights Images Influence Information Input(s) Loops Manipulation Opinions Output(s)	Photos Product Program Repetition Screenshot Search engine Search results Selection Sequence Snippets Software Structures Variables Video Website	• Can I evaluate code, understanding what it does and using adapt existing to code for a specific purpose? • Can I debug programs and make them more efficient? Can I use sequence, selection, repetition or variables within my program? • Can I design appropriate housing for their product using CAD software, including any input or output devices needed to make it work? • Can I create an appealing website for their product, aimed at their target audience which explains what their product is and what it does, using persuasive language? • Can I create an edited video of their project, articulating the key benefits? • Can I describe and show how to search for information online and being aware of the accuracy of the results presented? Also, can I understand the difference between fact and opinion?