



St Mary's Catholic Junior School

Year 5

Computing Long Term Plan



Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Search engines	Programming: Music	Mars Rover 1	Micro:bit	Stop motion animation	Mars Rover 2
Online Safety (5 lessons)					

Curriculum Document		
Digital Literacy	Information Technology	Computer Science
<ul style="list-style-type: none"> Learning about how permissions work and how to change them Identifying possible issues with online communication Considering the effects of screen-time on physical and mental wellbeing Learning about online bullying and where to seek advice 	<p><u>Using software</u></p> <ul style="list-style-type: none"> Using logical thinking to explore software more independently, making predictions based on their previous experience Using a software programme (Sonic Pi or Scratch) to create music Using video editing software or animation software to animate Identify ways to improve and edit programs, videos, images etc. Independently learning how to use 3D design software package TinkerCAD <p><u>Using email and the internet</u></p> <ul style="list-style-type: none"> Developing searching skills to help find relevant information on the internet 	<p><u>Hardware</u></p> <ul style="list-style-type: none"> Learning that external devices can be programmed by a separate computer Learning the difference between ROM and RAM Recognising how the size of RAM affects the processing of data Understanding the fetch, decode, execute cycle <p><u>Networks and data representation</u></p> <ul style="list-style-type: none"> Learning the vocabulary associated with data: data and transmit Learning how the data for digital images can be compressed Recognising that computers transfer data in binary and understanding simple binary addition

	<ul style="list-style-type: none"> • Understanding how apps can access our personal information and how to alter the permissions. <p><u>Using Data</u></p> <ul style="list-style-type: none"> • Understanding how data is collected <p><u>Wider use of technology</u></p> <p>Learn about different forms of communication that have enveloped with the use of technology</p>	<ul style="list-style-type: none"> • Relating binary signals (Boolean) to the simple character-based language, ASCII • Learning that messages can be sent by binary code, reading binary up to 8 characters and carrying out binary calculations • Understanding how bit patterns represent images as pixels <p><u>Computational thinking</u></p> <ul style="list-style-type: none"> • Decomposing animations into a series of images • Decomposing a program without support • Decomposing a story to be able to plan a program to tell a story • Predicting how software will work based on previous experience • Writing more complex algorithms for a purpose <p><u>Programming</u></p> <ul style="list-style-type: none"> • Programming an animation • Iterating and developing their programming as they work • Beginning to use nested loops (loops within loops) • Debugging their own code • Writing code to create a desired effect • Using a range of programming commands • Using repetition within a program <p>Amending code within a live scenario</p>
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CURRICULUM ENTITLEMENT

	Key Computing Knowledge	Vocabulary		Assessment Criteria – ‘Can I...? statements’
Online Safety	<ul style="list-style-type: none"> To understand how apps can access our personal information and how to alter the permissions To be aware of the positive and negative aspects of online communication To understand how online information can be used to form judgements To discover ways to overcome bullying To understand how technology can affect health and wellbeing 	Accurate information Advice App permissions Application(s) Apps Bully(ing) Communication Emojis Health In-app purchases Information Judgement Memes Mental health Mindfulness Mini-biography Online	Online communication Opinion Organisation(s) Password Personal information Positive contributions Private information Real world Strong password Summarise Support Technology Trusted adult Wellbeing	<ul style="list-style-type: none"> Can I show an understanding that passwords need to be strong and that apps do require some form of passwords? Can I recognise different types of online communication and know who to go to if I need help with any communication matters online? Can I search for simple information about a person, such as their birthday or key life moments? Can I show that I know what bullying is and that it can occur both online and in the real world? Can I recognise when health and wellbeing are being affected in either a positive or negative way through online use? Can I offer a couple of advice tips to combat the negative effects of online use?
Search engines	<ul style="list-style-type: none"> To understand what a search engine is and how to use it To be aware that not everything online is true To search effectively To create an informative poster 	Algorithm Appropriate Copyright Correct Credit Data leak Deceive Fair Fake Inappropriate Incorrect Index	Keywords Network Privacy Rank Real Search engine Search engine TASK Web crawler Website	<ul style="list-style-type: none"> Can I explain what a search engine is, suggesting several search engines to use and explaining how to use them to find websites and information? Can I suggest that things online aren't always true and recognise what to check for? Can I explain why keywords are important and what TASK stands for, using these strategies to search effectively? Can I recognise the terms 'copyright' and 'fair use' and combining text and images in a poster?

	<ul style="list-style-type: none"> To understand how search engines work 	Information		<ul style="list-style-type: none"> Can I make parallels between book searching and internet searching, explaining the role of web crawlers and recognising that results are rated to decide rank?
Programming: Music	<ul style="list-style-type: none"> To tinker To create a program that plays themed music To plan a soundtrack program To program a soundtrack To program music 	Beat Buffer Bugs Code Coding Command(s) Debug Debugging Decompose Error(s) Format Instructions Live code Live loops Loop Melody Mindmap Music Output Performance	Pitch Plan Play Predict Program Programming Rehearsal Repeat Repetition Rhythm Sleep Sonic Pi Soundtrack Spacing Tempo Timbre Tinker Tutorials Typing Typo	<ul style="list-style-type: none"> Can I test and change ideas throughout the lesson? Can I explain what the basic commands do: 'play', 'sleep', '2.times do' Can I explain how my program linked to the theme? Including a loop in their work. Correcting their own simple mistakes. Can I explain my scene in the story? Am I able to link the musical concepts to my scene? Can I recognise that I can program my music in that way? Can I include a live loop and explaining its function? Using samples effectively to enhance music. Can I code a piece of music that combined a variety of structures? Using loops in their programming. Recognising that programming music is a way to apply their skills.
Mars Rover 1	<ul style="list-style-type: none"> To identify how and why data is collected from space To identify how messages can be sent using binary code To read and calculate numbers using binary code To identify the computer architecture of the Mars Rovers To use simple operations to calculate bit patterns 	8-bit binary Addition ASCII Binary Binary code Binary numbers Boolean Byte Communicate Construction CPU Data Data transmission	Instructions Internet Mars Rover Moon Numerical data Output Planet Radio signal RAM Research Scientist Sequence Signal Simulation Space	<ul style="list-style-type: none"> Can I identify some of the types of data which the Mars Rover could collect (for example, photos)? Can I explain how the Mars Rover transmits the data back to Earth (radio waves) and the challenges involved in this (the great distance)? Researching a comparative fact about the distance to Mars. Can I read any number in binary, up to eight bits? Can I identify input, processing and output on the Mars Rovers? Can I read binary numbers and grasp the concept of binary addition?

	<ul style="list-style-type: none"> To represent binary as text 	Decimal numbers Design Discovery Distance Hexadecimal Input	Subtraction Technology Transmit	<ul style="list-style-type: none"> Can I relate binary signals (Boolean) to a simple character based language, ASCII?
Micro:bit	<ul style="list-style-type: none"> To tinker To program an animation To recognise coding structures To create a program 	Algorithm Animation App Block(s) Bluetooth Code Code block(s) Coding Connection Create Debug Decompose Decomposing Designing Desktop Device Download Images Input Inputs Instructions Internet Laptop	Load Loop Menu Micro:bit Outputs Pairing Pedometer Polling Predict Program Programmer Programming Repetition Reset Sabotage Scoreboard Screen Systematic Tablet Tinkering USB Variables Webpage Wifi Wireless Wires	<ul style="list-style-type: none"> Can I show confidence to clip blocks together and predict what will happen? Can I make connections with previous programming interfaces they've used, e.g. Scratch? Can I create my own images to make the animation and recognising the difference between 'on start' and 'forever'? Can I recognise blocks I've used previously, identifying inputs and outputs used and making predictions about how variables work? Can I choose appropriate blocks to complete the program and attempting the challenges independently? Can I break a program down into smaller steps, suggesting appropriate blocks and matching the algorithm to the program?
Stop motion animation	<ul style="list-style-type: none"> To understand what animation is 	Animation Animator Background Character	Frame(s) Model Moving images Onion skinning	<ul style="list-style-type: none"> Can I create a toy with simple images with a single movement?

	<ul style="list-style-type: none"> • To understand what stop motion animation is • To plan my stop motion video, thinking about the characters I want to use • To create a stop motion animation • To edit and assess my stop motion animation 	Decomposition Design Digital device Edit Evaluate Flip book Fluid movement	Still images Stop motion Storyboard Thaumatrope Zoetrope	<ul style="list-style-type: none"> • Can I create a short stop motion with small changes between images? • Can I think of a simple story idea for my animation then decompose it into smaller parts to create a storyboard with simple characters? • Can I make small changes to the models to ensure a smooth animation and deleting unnecessary frames? • Can I make a clear animation with added effects such as extending parts and the use of a title? They will also be able to provide helpful feedback to other groups about their animations.
Mars Rover 2	<ul style="list-style-type: none"> • To understand how bit patterns represent images as pixels • To explain how the data for digital images can be compressed • To identify and explain the 'fetch, decode, execute' cycle • To create a safe online profile and tinker with 3D design software • To modify the design of a 3D object using CAD software 	3D Algorithm Binary image CAD Compression CPU Data Drag and drop Fetch, decode, execute cycle ID card Input JPEG Memory	Online community Operating system Output Pixel(s) RAM Responsible RGB ROM Safe	<ul style="list-style-type: none"> • Can I create a pixel picture, explaining that a pixel is the smallest element of a digital image and that binary is used to code and transfer this data? • Can I save JPEG as a bitmap and recognise the difference in file size as well as explaining how pixels are used to transfer image data? • Can I explain the 'fetch, decode, execute' cycle in relation to real-world situations? • Can I create a profile with a safe and suitable username and password and beginning to use 3D design tools? • Can I independently take tutorial lessons, applying what I have learnt to their design and understanding the importance of using an online community responsibly?