St Theresa's Catholic Primary School

Curriculum Design:

Including Endpoints

Computing

Computing Overview

Year Group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
EYFS	Barefoot computing activities throughout the year – unplugged and ipad activities.					
Year 1	Computing Systems and Networks - Technology around us	Creating Media - Digital Painting	Programming A - Moving a Robot	Data and Information - Grouping Data	Creating Media - Digital Writing	Programming B – An Introduction to Animations
Year 2	Computing Systems and Networks - IT around us	Creating Media - Making Music	Data and information - Pictograms	Programming A - Robot Algorithms	Programming B - An Introduction to Quizzes	Creating Media - Digital Photography
Year 3	Computer systems and networks - Connecting Computers	Creating Media - Stop-frame Animation	Programming A - Sequence in music	Data and Information - Branching databases	Creating Media - Desktop publishing	Programming B - Events and actions
Year 4	Computing Networks and Systems - The Internet	Creating Media - Audio editing	Programming A - Repetition in shapes	Data and Information – Data Logging	Creating Media - Photo editing	Programming B - Repetition in games
Year 5	Computing systems and networks – Sharing information	Creating media – Video editing	Programming A – Selection in physical computing	Data and information – Flat-file databases	Creating media – Vector drawing	Programming B – Selection in quizzes
Year 6	Computing Systems and Networks - Communication	Creating Media - Web page creation	Programming A - Variables in games	Data Handling - Spreadsheets	Creating Media - 3D Modelling	Programming B - Sensing

Computing Overview – National Curriculum requirements.

Rec	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
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.	create and debug simple programs use logical reasoning to predict the behaviour of simple programs recognise common uses of information technology beyond school use technology purposefully to create, organise, store, manipulate and retrieve digital content	understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions use technology purposefully to create, organise, store, manipulate and retrieve digital content create and debug simple programs	use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	use sequence, selection, and repetition in programs; work with variables and various forms of input and output 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 search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts	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.

EYFS

There are no Early Learning Goals or requirements for computing in the revised EYFS statutory documents but learning computational concepts and skills will cross many of the 17 learning areas in the Early Years.

Skills

Children will have access to Barefoot computing activities and use various resources such as Bee Bots and i-pads to support learning. They will have access to many 'unplugged' computational activities such as exploring patterns, map making, floating and sinking concepts and creating algorithms through instructions and directions.

They will learn to become computational thinkers through key concepts and approaches by:

Using logical Reasoning, anticipating and explaining Pattern comparing, spotting similarities and differences
Using abstraction working out what is important and ignoring what is not important
Using algorithms instructions and sequencing Concepts
Using decomposition by breaking problems down into steps

Year 1

Autumn Term	
Skills	
Technology all around us. -I can explain how technology helps us - I can explain technology as something that helps us - I can locate examples of technology in the classroom -I can discuss how we benefit from rules - I can give examples of some of these rules - I can identify rules to keep us safe and healthy when we are using technology in and beyond the home	**Creating media – digital painting.** -I can draw lines on a screen and explain which tools I used - I can make marks on a screen and explain which tools I used - I can use the paint tools to draw a picture -I can make marks with the square and line tools - I can use the shape and line tools effectively -I can choose appropriate shapes - I can make appropriate colour choices - I can say which tools were helpful and why - I know that different paint tools do different jobs -I can change the colour and brush sizes - I can make dots of colour on the page -I can explain that pictures can be made in lots of different ways - I can say whether I prefer painting using a computer or using paper - I can spot the differences between painting on a computer and on paper
Vocabulary: Rules, online, private information, e-mail. Purpose, Online tools, Communicate	
Knowledge: -To identify technology -To identify a computer and its main parts	-To describe what different freehand tools do -To use the shape tool and the line tools -To make careful choices when painting a digital picture

-To use a mouse in different ways -To use a keyboard to type on a computer -To use the keyboard to edit text -To create rules for using technology responsibly	-To explain why I chose the tools I used -To use a computer on my own to paint a picture -To compare painting a picture on a computer and on paper

Year 1

Spring Term	
Skills	
Program A – moving a robot. -I can match a command to an outcome - I can predict the outcome of a command on a device - I can run a command on a device -I can follow an instruction - I can give directions - I can recall words that can be acted out -I can compare forwards and backwards movements - I can predict the outcome of a sequence involving forwards and backwards commands - I can start a sequence from the same place -I can compare left and right turns - I can experiment with turn and move commands to move a robot - I can predict the outcome of a sequence involving up to four commands -I can choose the order of commands in a sequence - I can debug my program - I can explain what my program should do -I can identify several possible solutions - I can plan two programs - I can use two different programs to get to the same place	**Data and Information – grouping data.** -I can describe objects using labels - I can identify the label for a group of objects - I can match objects to groups -I can count a group of objects - I can count objects - I can group objects -I can describe an object - I can describe a property of an object - I can find objects with similar properties I can count how many objects share a property - I can group objects in more than one way - I can group similar objects -I can choose how to group objects - I can describe groups of objects - I can record how many objects are in a group -I can compare groups of objects - I can decide how to group objects to answer a question - I can record and share what I have found

Vocabulary: Instructions, buttons, robots, patterns, program, Photographs, Video, Sound, Data, Pictogram, Digitally	
Knowledge: -To explain what a given command will do -To act out a given word -To combine forwards and backwards commands to make a sequence -To combine four direction commands to make sequences -To plan a simple program -To find more than one solution to a problem	-To label objects -To identify that objects can be counted -To describe objects in different ways -To count objects with the same properties -To compare groups of objects -To answer questions about groups of objects

Year 1

Summer Term	
Skills	
Creating media – digital writing. -I can compare different programming tools - I can find which commands to move a sprite - I can use commands to move a sprite -I can run my program - I can use a Start block in a program - I can use more than one block by joining them together	**Program B – introduction to animations.** -I can identify and find keys on a keyboard - I can open a word processor - I can recognise keys on a keyboard -I can enter text into a computer - I can use backspace to remove text - I can use letter, number, and space keys

-I can change the value - I can find blocks that have numbers - I can say what happens when I change a value -I can add blocks to each of my sprites - I can delete a sprite - I can show that a project can include more than one sprite -I can choose appropriate artwork for my project - I can create an algorithm for each sprite - I can decide how each sprite will move -I can add programming blocks based on my algorithm - I can test the programs I have created - I can use sprites that match my design	-I can explain what the keys that I have learnt about already do - I can identify the toolbar and use bold, italic, and underline - I can type capital letters -I can change the font - I can select all of the text by clicking and dragging - I can select a word by double-clicking -I can decide if my changes have improved my writing - I can say what tool I used to change the text - I can use 'undo' to remove changes -I can explain the differences between typing and writing - I can make changes to text on a computer - I can say why I prefer typing or writing -I can compare different programming tools -I can run my program -I can choose appropriate artwork for my project
Vocabulary: Videos, Camera stills, Sounds, Image bank, Word bank, Space bar	
Knowledge: -To use a computer to write -To add and remove text on a computer -To identify that the look of text can be changed on a computer -To make careful choices when changing text -To explain why I used the tools that I chose -To compare typing on a computer to writing on paper	-To choose a command for a given purpose -To show that a series of commands can be joined together -To identify the effect of changing a value -To explain that each sprite has its own instructions -To design the parts of a project -To use my algorithm to create a program

Year 2

Autumn Term	
Skills	
Systems and networks – IT around us. -I can describe some uses of computers - I can identify examples of computers - I can identify that a computer is a part of IT -I can identify examples of IT - I can identify that some IT can be used in more than one way - I can sort school IT by what it's used for -I can find examples of information technology - I can sort IT by where it is found - I can talk about uses of information technology -I can demonstrate how IT devices work together - I can recognise common types of technology - I can say why we use IT -I can list different uses of information technology - I can say how rules can help keep me safe - I can talk about different rules for using IT -I can explain the need to use IT in different ways - I can identify the choices that I make when using IT I can use IT for different types of activities I can use IT for different types of activities	**Creating media – making music.** -I can describe music using adjectives - I can identify simple differences in pieces of music - I can say what I do and don't like about a piece of music -I can create a rhythm pattern - I can explain that music is created and played by humans - I can play an instrument following a rhythm pattern -I can connect images with sounds - I can relate an idea to a piece of music - I can use a computer to experiment with pitch -I can explain how my music can be played in different ways - I can identify that music is a sequence of notes - I can refine my musical pattern on a computer -I can add a sequence of notes to my rhythm - I can create a rhythm which represents an animal I've chosen - I can create my animal's rhythm on a computer -I can explain how I changed my work - I can listen to music and describe how it makes me feel - I can review my work
Vocabulary: Information sources, Communication, Purposes, Website content, Appropriate/inappropriate sites, Cyber-bullying, Digital footprint, Keyword searching	

Knowledge: -To recognise the uses and features of information technology -To identify the uses of information technology in the school -To identify information technology beyond school -To explain how information technology helps us -To explain how to use information technology safely -To recognise that choices are made when using information technology	-To say how music can make us feel -To identify that there are patterns in music -To experiment with sound using a computer -To use a computer to create a musical pattern -To create music for a purpose -To review and refine our computer work

Year 2

Spring Term	
Skills	
Data and Information – Pictograms. - I can compare totals in a tally chart - I can record data in a tally chart - I can represent a tally count as a total -I can enter data onto a computer - I can use a computer to view data in a different format - I can use pictograms to answer simple questions about objects -I can explain what the pictogram shows - I can organise data in a tally chart - I can use a tally chart to create a pictogram -I can answer 'more than'/'less than' and 'most/least' questions about an attribute	**Programming A – Moving a robot.** -I can choose a series of words that can be enacted as a sequence - I can follow instructions given by someone else - I can give clear instructions -I can show the difference in outcomes between two sequences that consist of the same commands - I can use an algorithm to program a sequence on a floor robot - I can use the same instructions to create different algorithms -I can compare my prediction to the program outcome - I can follow a sequence - I can predict the outcome of a sequence

- I can create a pictogram to arrange objects by an attribute - I can tally objects using a common attribute -I can choose a suitable attribute to compare people - I can collect the data I need - I can create a pictogram and draw conclusions from it -I can give simple examples of why information should not be shared - I can share what I have found out using a computer - I can use a computer program to present information in different ways	-I can explain the choices I made for my mat design - I can identify different routes around my mat - I can test my mat to make sure that it is usable I can create an algorithm to meet my goal - I can explain what my algorithm should achieve - I can use my algorithm to create a program -I can plan algorithms for different parts of a task - I can put together the different parts of my program - I can test and debug each part of the program
Vocabulary: Capturing moments, Magnified images, Questions , Data collection, Graphs, Charts, Save, Retrieve, Forward, Backward, Right-angle turn, Algorithm, Sequence, Debug, Predict	
Knowledge: -To recognise that we can count and compare objects using tally charts -To recognise that objects can be represented as pictures -To create a pictogram -To select objects by attribute and make comparisons -To recognise that people can be described by attributes -To explain that we can present information using a computer	-To describe a series of instructions as a sequence -To explain what happens when we change the order of instructions -To use logical reasoning to predict the outcome of a program -To explain that programming projects can have code and artwork -To design an algorithm -To create and debug a program that I have written

Year 2

Summer Term	
Skills	
Programing B – Introduction to quizzes. -I can identify that a program needs to be started - I can identify the start of a sequence - I can show how to run my program -I can change the outcome of a sequence of commands - I can match two sequences with the same outcome - I can predict the outcome of a sequence of commands -I can build the sequences of blocks I need - I can decide which blocks to use to meet the design - I can work out the actions of a sprite in an algorithm -I can choose backgrounds for the design - I can choose characters for the design - I can create a program based on the new design I can compare my project to my design - I can debug my program - I can improve my project by adding features -I can build sequences of blocks to match my design - I can choose the images for my own design - I can create an algorithm -I can compare my project to my design - I can debug my program - I can improve my project by adding features -I can compare my project to my design - I can debug my program - I can improve my project by adding features	**Creating Media – Digital photography.** -I can explain what I did to capture a digital photo - I can recognise what devices can be used to take photographs - I can talk about how to take a photograph -I can explain the process of taking a good photograph - I can explain why a photo looks better in portrait or landscape format - I can take photos in both landscape and portrait format -I can discuss how to take a good photograph - I can identify what is wrong with a photograph - I can improve a photograph by retaking it -I can experiment with different light sources - I can explain why a picture may be unclear - I can explore the effect that light has on a photo -I can explain my choices - I can recognise that images can be changed - I can use a tool to achieve a desired effect -I can apply a range of photography skills to capture a photo - I can identify which photos are real and which have been changed - I can recognise which photos have been changed

Vocabulary: Paint effects, Templates, Animation, Documents, Index finger typing, Enter/return, Caps lock, Backspace	
Knowledge: -To explain that a sequence of commands has a start -To explain that a sequence of commands has an outcome -To create a program using a given design -To change a given design -To create a program using my own design -To decide how my project can be improved	- To use a digital device to take a photograph -To make choices when taking a photograph -To describe what makes a good photograph -To decide how photographs can be improved -To use tools to change an image -To recognise that photos can be changed

Year 3

Autumn Term	
Skills	
Skills: **Computing networks and systems – connecting computers.** -I can explain that digital devices accept inputs - I can explain that digital devices produce outputs - I can follow a process -I can classify input and output devices - I can describe a simple process - I can design a digital device -I can explain how I use digital devices for different activities - I can recognise similarities between using digital devices and non-digital tools - I can suggest differences between using digital devices and non-digital tools -I can discuss why we need a network switch - I can explain how messages are passed through multiple connections - I can recognise different connections -I can demonstrate how information can be passed between devices - I can explain the role of a switch, server, and wireless access point in a network - I can recognise that a computer network is made up of a number of devices -I can identify how devices in a network are connected together - I can identify networked devices around me - I can identify the benefits of computer networks	**Creating media – stop frame animation.** -I can create an effective flip book—style animation - I can draw a sequence of pictures - I can explain how an animation/flip book works -I can create an effective stop-frame animation - I can explain why little changes are needed for each frame - I can predict what an animation will look like -I can break down a story into settings, characters and events - I can create a storyboard - I can describe an animation that is achievable on screen -I can evaluate the quality of my animation - I can review a sequence of frames to check my work - I can use onion skinning to help me make small changes between frames -I can evaluate another learner's animation - I can explain ways to make my animation better - I can improve my animation based on feedback -I can add other media to my animation - I can evaluate my final film - I can explain why I added other media to my animation

Vocabulary: E-safety rules, Secure passwords, Report, abuse, button, gaming, blogs., School network, Devices, Computer parts, Collaborate, Appropriate online communication, Search tools, Appropriate websites, Owner	
Knowledge: -To explain how digital devices function -To identify input and output devices -To recognise how digital devices can change the way we work -To explain how a computer network can be used to share information -To explore how digital devices can be connected -To recognise the physical components of a network	-To explain that animation is a sequence of drawings or photographs -To relate animated movement with a sequence of images -To plan an animation -To identify the need to work consistently and carefully -To review and improve an animation -To evaluate the impact of adding other media to an animation

Year 3

Spring Term	
Skills	
Skills: **Programming A – sequencing in music.** -I can explain that objects in Scratch have attributes (linked to) - I can identify the objects in a Scratch project (sprites, backdrops) - I can recognise that commands in Scratch are represented as blocks -I can choose a word which describes an on-screen action for my plan - I can create a program following a design - I can identify that each sprite is controlled by the commands I choose -I can create a sequence of connected commands - I can explain that the objects in my project will respond exactly to the code - I can start a program in different ways	**Data and information – branching data bases.** -I can create two groups of objects separated by one attribute - I can investigate questions with yes/no answers - I can make up a yes/no question about a collection of objects -I can arrange objects into a tree structure - I can create a group of objects within an existing group - I can select an attribute to separate objects into groups -I can group objects using my own yes/no questions - I can select objects to arrange in a branching database - I can test my branching database to see if it works

-I can combine sound commands - I can explain what a sequence is - I can order notes into a sequence -I can build a sequence of commands - I can decide the actions for each sprite in a program - I can make design choices for my artwork -I can identify and name the objects I will need for a project - I can implement my algorithm as code - I can relate a task description to a design	-I can compare two branching database structures - I can create yes/no questions using given attributes - I can explain that questions need to be ordered carefully to split objects into similarly sized groups -I can create a physical version of a branching database - I can create questions that will enable objects to be uniquely identified - I can independently create questions to use in a branching database -I can create a branching database that reflects my plan - I can suggest real-world uses for branching databases - I can work with a partner to test my identification tool
Vocabulary: Sequence instructions , Sequence debugging, Test + improve, Logo commands, Sequence programming	
Knowledge: -To explore a new programming environment -To identify that commands have an outcome -To explain that a program has a start -To recognise that a sequence of commands can have an order -To change the appearance of my project -To create a project from a task description	-To create questions with yes/no answers -To identify the attributes needed to collect data about an object -To create a branching database -To explain why it is helpful for a database to be well structured -To plan the structure of a branching database -To independently create an identification tool

Year 3

Summer Term	
Skills	
Skills: **Creating media – desktop publishing.** -I can explain the difference between text and images - I can identify the advantages and disadvantages of using text and images - I can recognise that text and images can communicate messages clearly -I can change font style, size, and colours for a given purpose - I can edit text - I can explain that text can be changed to communicate more clearly -I can create a template for a particular purpose - I can define the term 'page orientation' - I can recognise placeholders and say why they are important -I can choose the best locations for my content - I can make changes to content after I've added it - I can paste text and images to create a magazine cover -I can choose a suitable layout for a given purpose - I can identify different layouts - I can match a layout to a purpose -I can compare work made on desktop publishing to work created by hand - I can identify the uses of desktop publishing in the real world - I can say why desktop publishing might be helpful	**Programing B – events and actions.** -I can choose which keys to use for actions and explain my choices - I can explain the relationship between an event and an action - I can identify a way to improve a program -I can choose a character for my project - I can choose a suitable size for a character in a maze - I can program movement -I can choose blocks to set up my program - I can consider the real world when making design choices - I can use a programming extension -I can build more sequences of commands to make my design work - I can choose suitable keys to turn on additional features - I can identify additional features (from a given set of blocks) -I can match a piece of code to an outcome - I can modify a program using a design - I can test a program against a given design -I can evaluate my project - I can implement my design - I can make design choices and justify them
Vocabulary: Questioning , Database, Construct, Contribute, Recording data, Data logger, Present data, Multimedia, Presentations, Alignment, Brush size, Repeats Reflections, Green screening , Amend, Copy, Paste	

Knowledge: -To recognise how text and images convey information -To recognise that text and layout can be edited -To choose appropriate page settings -To add content to a desktop publishing publication -To consider how different layouts can suit different purposes -To consider the benefits of desktop publishing	-To explain how a sprite moves in an existing project -To create a program to move a sprite in four directions -To adapt a program to a new context -To develop my program by adding features -To identify and fix bugs in a program -To design and create a maze-based challenge

Year 4

Autumn Term	
Skills	
Skills: **Computing networks and systems- The internet.** -I can demonstrate how information is shared across the internet - I can describe the internet as a network of networks - I can discuss why a network needs protecting -I can describe networked devices and how they connect - I can explain that the internet is used to provide many services - I can recognise that the World Wide Web contains websites and web pages -I can describe how to access websites on the WWW - I can describe where websites are stored when uploaded to the WWW - I can explain the types of media that can be shared on the WWW -I can explain that internet services can be used to create content online - I can explain what media can be found on websites - I can recognise that I can add content to the WWW	**Creating media – audio editing.** -I can explain that the person who records the sound can say who is allowed to use it - I can identify the input and output devices used to record and play sound - I can use a computer to record audio -I can discuss what sounds can be added to a podcast - I can inspect the soundwave view to know where to trim my recording - I can re-record my voice to improve my recording -I can explain how sounds can be combined to make a podcast more engaging - I can plan appropriate content for a podcast - I can save my project so the different parts remain editable

-I can explain that there are rules to protect content - I can explain that websites and their content are created by people - I can suggest who owns the content on websites -I can explain that not everything on the World Wide Web is true - I can explain why I need to think carefully before I share or reshare content - I can explain why some information I find online may not be honest, accurate, or legal	-I can improve my voice recordings - I can record content following my plan - I can review the quality of my recordings -I can arrange multiple sounds to create the effect I want - I can explain the difference between saving a project and exporting an audio file - I can open my project to continue working on it -I can choose appropriate edits to improve my podcast - I can listen to an audio recording to identify its strengths - I can suggest improvements to an audio recording
Vocabulary: E-safety rules, Secure passwords, Report, abuse, button, Gaming, Blogs, Creating + modifying, Specific purpose, Photo modifying, Keyboard shortcuts Bullet points, Spell check, Different networks, Information collection, Reliability , Owners	
Knowledge: -To describe how networks physically connect to other networks -To recognise how networked devices make up the internet -To outline how websites can be shared via the World Wide Web (WWW) -To describe how content can be added and accessed on the World Wide Web (WWW) -To recognise how the content of the WWW is created by people -To evaluate the consequences of unreliable content	-To identify that sound can be recorded -To explain that audio recordings can be edited -To recognise the different parts of creating a podcast project -To apply audio editing skills independently -To combine audio to enhance my podcast project -To evaluate the effective use of audio

Year 4

Spring Term	
Skills	
Skills: **Programing A – repetition in shapes.** -I can create a code snippet for a given purpose - I can explain the effect of changing a value of a command - I can program a computer by typing commands -I can test my algorithm in a text-based language - I can use a template to create a design for my program - I can write an algorithm to produce a given outcome -I can identify everyday tasks that include repetition as part of a sequence, eg brushing teeth, dance moves - I can identify patterns in a sequence - I can use a count-controlled loop to produce a given outcome -I can choose which values to change in a loop - I can identify the effect of changing the number of times a task is repeated - I can predict the outcome of a program containing a count-controlled loop -I can explain that a computer can repeatedly call a procedure - I can identify 'chunks' of actions in the real world - I can use a procedure in a program -I can design a program that includes count-controlled loops - I can develop my program by debugging it - I can make use of my design to write a program	**Data and info – data logging.** -I can choose a data set to answer a given question - I can identify data that can be gathered over time - I can suggest questions that can be answered using a given data set -I can explain what data can be collected using sensors - I can identify that data from sensors can be recorded - I can use data from a sensor to answer a given question -I can identify the intervals used to collect data - I can recognise that a data logger collects data at given points - I can talk about the data that I have captured -I can explain that there are different ways to view data - I can sort data to find information - I can view data at different levels of detail -I can plan how to collect data using a data logger - I can propose a question that can be answered using logged data - I can use a data logger to collect data -I can draw conclusions from the data that I have collected - I can explain the benefits of using a data logger - I can interpret data that has been collected using a data logger
Vocabulary: Database creation, Database searches, Inaccurate data	

Knowledge: -To identify that accuracy in programming is important -To create a program in a text-based language -To explain what 'repeat' means -To modify a count-controlled loop to produce a given outcome -To decompose a task into small steps -To create a program that uses count-controlled loops to produce a given outcome	-To explain that data gathered over time can be used to answer questions -To use a digital device to collect data automatically -To explain that a data logger collects 'data points' from sensors over time -To recognise how a computer can help us analyse data -To identify the data needed to answer questions -To use data from sensors to answer questions

Year 4

Summer Term	
Skills	
Creating media – photo editing -I can explain why I might crop an image - I can improve an image by rotating it - I can use photo editing software to crop an image -I can experiment with different colour effects - I can explain that different colour effects make you think and feel different things - I can explain why I chose certain colour effects -I can add to the composition of an image by cloning - I can identify how a photo edit can be improved - I can remove parts of an image using cloning -I can experiment with tools to select and copy part of an image - I can explain why photos might be edited - I can use a range of tools to copy between images	**Programming B – repetition in games.** -I can list an everyday task as a set of instructions including repetition - I can modify a snippet of code to create a given outcome - I can predict the outcome of a snippet of code -I can choose when to use a count-controlled and an infinite loop - I can modify loops to produce a given outcome - I can recognise that some programming languages enable more than one process to be run at once -I can choose which action will be repeated for each object - I can evaluate the effectiveness of the repeated sequences used in my program - I can explain what the outcome of the repeated action should be -I can explain the effect of my changes - I can identify which parts of a loop can be changed - I can re-use existing code snippets on new sprites

-I can choose suitable images for my project - I can create a project that is a combination of other images - I can describe the image I want to create -I can combine text and my image to complete the project - I can review images against a given criteria - I can use feedback to guide making changes	-I can develop my own design explaining what my project will do - I can evaluate the use of repetition in a project - I can select key parts of a given project to use in my own design -I can build a program that follows my design - I can evaluate the steps I followed when building my project - I can refine the algorithm in my design
Vocabulary: Type + edit logo commands, Sensors, Open-ended problems, Bugs in programs , Complex programming	
Knowledge: -To explain that the composition of digital images can be changed -To explain that colours can be changed in digital images -To explain how cloning can be used in photo editing -To explain that images can be combined -To combine images for a purpose -To evaluate how changes can improve an image	-To develop the use of count-controlled loops in a different programming environment -To explain that in programming there are infinite loops and count controlled loops -To develop a design that includes two or more loops which run at the same time -To modify an infinite loop in a given program -To design a project that includes repetition -To create a project that includes repetition

Year 5

Autumn Term	
Skills	
Computing systems and networks – sharing information. -I can describe that a computer system features inputs, processes, and outputs - I can explain that computer systems communicate with other devices - I can explain that systems are built using a number of parts -I can explain the benefits of a given computer system - I can identify tasks that are managed by computer systems - I can identify the human elements of a computer system -I can compare results from different search engines - I can make use of a web search to find specific information - I can refine my web search -I can explain why we need tools to find things online - I can recognise the role of web crawlers in creating an index - I can relate a search term to the search engine's index -I can explain that a search engine follows rules to rank results - I can give examples of criteria used by search engines to rank results - I can order a list by rank -I can describe some of the ways that search results can be influenced - I can explain how search engines make money - I can recognise some of the limitations of search engines -I can describe some of the ways that search results can be influenced - I can explain how search engines make money - I can recognise some of the limitations of search engines	**Creating media – video editing.** -I can compare features in different videos - I can explain that video is a visual media format - I can identify features of videos -I can experiment with different camera angles - I can identify and find features on a digital video recording device - I can make use of a microphone -I can capture video using a range of filming techniques - I can review how effective my video is - I can suggest filming techniques for a given purpose -I can create and save video content - I can decide which filming techniques I will use - I can outline the scenes of my video -I can explain how to improve a video by reshooting and editing - I can select the correct tools to make edits to my video - I can store, retrieve, and export my recording to a computer -I can evaluate my video and share my opinions - I can make edits to my video and improve the final outcome - I can recognise that my choices when making a video will impact on the quality of the final outcome

Vocabulary: Explore procedures , Refine procedures, Variable, Hardware + software control, Change inputs, Different outputs, Articulate solutions, Commands, Online sharing, Multimedia effects, Multimedia modification , Transitions, Hyperlinks, Editing tools, Refining, Online sharing	
Knowledge: -To explain that computers can be connected together to form systems -To recognise the role of computer systems in our lives -To experiment with search engines -To describe how search engines select results -To explain how search results are ranked -To recognise why the order of results is important, and to whom	-To explain what makes a video effective -To identify digital devices that can record video -To capture video using a range of techniques -To create a storyboard -To identify that video can be improved through reshooting and editing -To consider the impact of the choices made when making and sharing a video

Year 5

Spring Term	
Skills	
Programming A – Selection in physical computing. -I can create a simple circuit and connect it to a microcontroller - I can explain what an infinite loop does - I can program a microcontroller to make an LED switch on -I can connect more than one output component to a microcontroller - I can design sequences that use count-controlled loops - I can use a count-controlled loop to control outputs -I can design a conditional loop - I can explain that a condition is either true or false - I can program a microcontroller to respond to an input -I can explain that a condition being met can start an action - I can identify a condition and an action in my project	**Data and information – flat file data bases.** -I can create a database using cards - I can explain how information can be recorded - I can order, sort, and group my data cards -I can choose which field to sort data by to answer a given question - I can explain what a field and a record is in a database - I can navigate a flat-file database to compare different views of information -I can combine grouping and sorting to answer specific questions - I can explain that data can be grouped using chosen values - I can group information using a database

- I can use selection (an ‘if…then…’ statement) to direct the flow of a program -I can create a detailed drawing of my project - I can describe what my project will do - I can identify a real-world example of a condition starting an action -I can test and debug my project - I can use selection to produce an intended outcome - I can write an algorithm that describes what my model will do	-I can choose multiple criteria to answer a given question - I can choose which field and value are required to answer a given question - I can outline how ‘AND’ and ‘OR’ can be used to refine data selection -I can explain the benefits of using a computer to create charts - I can refine a chart by selecting a particular filter - I can select an appropriate chart to visually compare data -I can ask questions that will need more than one field to answer - I can present my findings to a group - I can refine a search in a real-world context
Vocabulary: Explore procedures , Refine procedures, Variable, Hardware + software control, Change inputs, Different outputs, Articulate solutions, Commands	
Knowledge: -To control a simple circuit connected to a computer -To write a program that includes count-controlled loops -To explain that a loop can stop when a condition is met -To explain that a loop can be used to repeatedly check whether a condition has been met -To design a physical project that includes selection -To create a program that controls a physical computing project	-To use a form to record information -To compare paper and computer-based databases -To outline how you can answer questions by grouping and then sorting data -To explain that tools can be used to select specific data -To explain that computer programs can be used to compare data visually -To use a real-world database to answer questions

Year 5

Summer Term	
Skills	
Creating media – vector drawings. -I can discuss how vector drawings are different from paper-based drawings - I can experiment with the shape and line tools - I can recognise that vector drawings are made using shapes -I can explain that each element added to a vector drawing is an object - I can identify the shapes used to make a vector drawing - I can move, resize, and rotate objects I have duplicated -I can explain how alignment grids and resize handles can be used to improve consistency - I can modify objects to create a new image - I can use the zoom tool to help me add detail to my drawings -I can change the order of layers in a vector drawing - I can identify that each added object creates a new layer in the drawing - I can use layering to create an image -I can copy part of a drawing by duplicating several objects - I can recognise when I need to group and ungroup objects - I can reuse a group of objects to further develop my vector drawing -I can compare vector drawings to freehand paint drawings - I can create a vector drawing for a specific purpose - I can reflect on the skills I have used and why I have used them	**Program B – Selection in quizzes.** -I can identify conditions in a program - I can modify a condition in a program - I can recall how conditions are used in selection -I can create a program with different outcomes using selection - I can identify the condition and outcomes in an 'if... then… else...' statement - I can use selection in an infinite loop to check a condition -I can design the flow of a program which contains 'if… then… else…' - I can explain that program flow can branch according to a condition - I can show that a condition can direct program flow in one of two ways -I can identify the outcome of user input in an algorithm - I can outline a given task - I can use a design format to outline my project -I can implement my algorithm to create the first section of my program - I can share my program with others - I can test my program -I can extend my program further - I can identify the setup code I need in my program - I can identify ways the program could be improved
Vocabulary: Complex searches (and/or: </>), Problem solving, Present answers, Analyse information Question data, Interpret	
Knowledge:	-To explain how selection is used in computer programs

-To identify that drawing tools can be used to produce different outcomes -To create a vector drawing by combining shapes -To use tools to achieve a desired effect -To recognise that vector drawings consist of layers -To group objects to make them easier to work with -To apply what I have learned about vector drawings	-To relate that a conditional statement connects a condition to an outcome -To explain how selection directs the flow of a program -To design a program which uses selection -To create a program which uses selection -To evaluate my program

Year 6

Autumn Term	
Skills	
Skills: **Computing systems and networks – communication**. -I can describe how computers use addresses to access websites - I can explain that internet devices have addresses - I can recognise that data is transferred using agreed methods -I can explain that all data transferred over the internet is in packets - I can explain that data is transferred over networks in packets - I can identify and explain the main parts of a data packet -I can explain that the internet allows different media to be shared - I can recognise how to access shared files stored online - I can send information over the internet in different ways -I can explain how the internet enables effective collaboration - I can identify different ways of working together online - I can recognise that working together on the internet can be public or private	**Creating media – web page creation.** -I can discuss the different types of media used on websites - I can explore a website - I know that websites are written in HTML -I can draw a web page layout that suits my purpose - I can recognise the common features of a web page - I can suggest media to include on my page -I can describe what is meant by the term ‘fair use’ - I can find copyright-free images - I can say why I should use copyright-free images -I can add content to my own web page - I can evaluate what my web page looks like on different devices and suggest/make edits - I can preview what my web page looks like

-I can choose methods of communication to suit particular purposes - I can explain the different ways in which people communicate - I can identify that there are a variety of ways to communicate over the internet -I can compare different methods of communicating on the internet - I can decide when I should and should not share information online - I can explain that communication on the internet may not be private	-I can describe why navigation paths are useful - I can explain what a navigation path is - I can make multiple web pages and link them using hyperlinks -I can create hyperlinks to link to other people's work - I can evaluate the user experience of a website - I can explain the implication of linking to content owned by others
Vocabulary: Generate, Process, Interpret, Store, Present information, Plausibility, Appropriate data tool, Interrogate, Investigations	
Knowledge: -To explain the importance of internet addresses -To recognise how data is transferred across the internet -To explain how sharing information online can help people to work together -To evaluate different ways of working together online -To recognise how we communicate using technology -To evaluate different methods of online communication	-To review an existing website and consider its structure -To plan the features of a web page -To consider the ownership and use of images (copyright) -To recognise the need to preview pages -To outline the need for a navigation path -To recognise the implications of linking to content owned by other people

Year 6

Spring Term

Skills

Skills:

Program A – variables in games.

-I can explain that the way a variable changes can be defined
- I can identify examples of information that is variable
- I can identify that variables can hold numbers or letters
-I can explain that a variable has a name and a value
- I can identify a program variable as a placeholder in memory for a single value
- I can recognise that the value of a variable can be changed
-I can decide where in a program to change a variable
- I can make use of an event in a program to set a variable
- I can recognise that the value of a variable can be used by a program
-I can choose the artwork for my project
- I can create algorithms for my project
- I can explain my design choices
-I can choose a name that identifies the role of a variable
- I can create the artwork for my project
- I can test the code that I have written
-I can identify ways that my game could be improved
- I can share my game with others
- I can use variables to extend my game

Data handling – spread sheets.

-I can collect data
- I can enter data into a spreadsheet
- I can suggest how to structure my data
-I can apply an appropriate format to a cell
- I can choose an appropriate format for a cell
- I can explain what an item of data is
-I can construct a formula in a spreadsheet
- I can explain which data types can be used in calculations
- I can identify that changing inputs changes outputs
-I can apply a formula to multiple cells by duplicating it
- I can calculate data using different operations
- I can create a formula which includes a range of cells
-I can apply a formula to calculate the data I need to answer questions
- I can explain why data should be organised
- I can use a spreadsheet to answer questions
-I can produce a chart
- I can suggest when to use a table or chart
- I can use a chart to show the answer to questions

Vocabulary:

Spreadsheets, Complex searches (and/or: </>), Problem solving, Present answers, Analyse information, Question data, Interpret

Knowledge: -To define a 'variable' as something that is changeable -To explain why a variable is used in a program -To choose how to improve a game by using variables -To design a project that builds on a given example -To use my design to create a project -To evaluate my project	-To create a data set in a spreadsheet -To build a data set in a spreadsheet -To explain that formulas can be used to produce calculated data -To apply formulas to data -To create a spreadsheet to plan an event -To choose suitable ways to present data

Year 6

Summer Term	
Skills	
Skills: **Creating media – 3D modelling.** -I can add 3D shapes to a project - I can move 3D shapes relative to one another - I can view 3D shapes from different perspectives -I can lift/lower 3D objects - I can recolour a 3D object - I can resize an object in three dimensions -I can duplicate 3D objects - I can group 3D objects - I can rotate objects in three dimensions -I can accurately size 3D objects - I can combine a number of 3D objects - I can show that placeholders can create holes in 3D objects -I can analyse a 3D model - I can choose objects to use in a 3D model - I can combine objects in a design	**Programing B – sensing.** -I can apply my knowledge of programming to a new environment - I can test my program on an emulator - I can transfer my program to a controllable device -I can determine the flow of a program using selection - I can identify examples of conditions in the real world - I can use a variable in an if, then, else statement to select the flow of a program -I can experiment with different physical inputs - I can explain that checking a variable doesn't change its value - I can use a condition to change a variable -I can explain the importance of the order of conditions in else, if statements

-I can construct a 3D model based on a design - I can explain how my 3D model could be improved - I can modify my 3D model to improve it	- I can modify a program to achieve a different outcome - I can use an operand (e.g. <>=) in an if, then statement -I can decide what variables to include in a project - I can design the algorithm for my project - I can design the program flow for my project -I can create a program based on my design - I can test my program against my design - I can use a range of approaches to find and fix bugs
Vocabulary: Information movement, Connecting devices, Different audiences, Research strategies, Search result rankings, Acknowledge resources	
Knowledge: -To recognise that you can work in three dimensions on a computer -To identify that digital 3D objects can be modified -To recognise that objects can be combined in a 3D model -To create a 3D model for a given purpose -To plan my own 3D model -To create my own digital 3D model	-To explain that selection can control the flow of a program -To update a variable with a user input -To use a conditional statement to compare a variable to a value -To design a project that uses inputs and outputs on a controllable device -To develop a program to use inputs and outputs on a controllable device