<table>
<tr><th colspan="3">Year 1 – Technology around us (from National Centre for Computing Education)</th></tr>
<tr><th>National Curriculum Objectives</th><th>Sticky Knowledge</th><th>Vocabulary</th></tr>
<tr><td rowspan="2">• Recognise common uses of ICT beyond school
• Use technology purposefully to create, organise, sort, manipulate and retrieve digital content
• 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</td><td rowspan="2">• Technology is man made
• Technology is something that helps us
• Technology covers different areas (e.g. communication, digital, tools, electrical)
• Technology can be dangerous, and there are rules to using it.</td><td>Technology, communication, digital, tools, electrical.
camera, computer, pencil, sharpener, mobile phone, laptop, scissors, glue stick, car, games console, mouse, cursor, keyboard, delete, arrow keys, edit, programme, icon, touch pads, start menu, applications, drop down menu, text box, save, file,</td></tr>
<tr><td>I can statements:
• I can identify different types of technology (e.g. communication, digital, tools, electrical)
• I can use technology safely
• I can name and use the parts of a computer
• I can create and save work to a file.
• I can identify and give an example of a rule to keep me safe when using technology</td></tr>
<tr><th>Prior Learning</th><th>Key Question(s):</th><th>Future Learning</th></tr>
<tr><td>In EYFS Children should:
• Explain the reasons for rules
• Safely use and explore a variety of tools</td><td>• What is technology?
• Where can technology be found?
• Have you used technology?
• When have you used technology?
• How can technology help us?
• Why would you want technology?
• What benefits can technology give us?</td><td>In Year 2 Children will:
• Learners will develop their understanding of what IT is and will begin to identify examples.
• Learners will discuss where they have seen IT in school and beyond.
• Learners will investigate how IT improves our world.
• Learners will extend their knowledge and the importance of using IT responsibly.</td></tr>
</table>

Year 1 – Creating Media - Digital Painting (from National Centre for Computing Education)

National Curriculum Objectives	Sticky Knowledge	Vocabulary
• Use technology purposefully to create, organise, sort, manipulate and retrieve digital content ART • To develop a wide range of art and design techniques in using colour, pattern, texture, line, shape, form and space. • About the work of a range of artists, craft makers and designers, describing the differences and similarities between different practices and disciplines making links to their own work.	• Understand and use free hand shape and line tools within IT • Recognise that computers can be used to create art • Recognise that a tool can be adjusted • To decide when it is appropriate to use each tool and to consider the impact of my choice. • To compare a painting using a computer and a painting using brushes	Free hand, shape, line, tool, fill, paint, appropriate, adjust, size, style, similarity, difference, preference, compare I can statements: • I can explain what different free hand tools do • I can create a picture using free hand, shape and line tools. • I can choose, adapt and use a range of paint tools • I can use the undo button to correct a mistake • I can create a piece of artwork using a range of IT painting tools
Prior Learning	**Key Question(s):**	**Future Learning**
In EYFS Children should: • Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. • To be confident to try new activities and show independence.	• What is are free hand, shape and line tools in IT? • Where can free hand, shape and line tools be found? • Have you used free hand, shape and line tools? • When have you used free hand, shape and line tools? • How can free hand, shape and line tools help us? • Why would you want to create artwork using free hand, shape and line tools? • What benefits can free hand, shape and line tools give us? • What differences can you see between computer and free hand paintings?	In Year 2 Children will: • Learn to recognise that different devices can be used to capture photographs • Gain experience capturing, editing and improving photos • Use the knowledge they have to recognise that images they see may not be real.

Year 1 – Programming A – Moving a Robot (from National Centre for Computing Education)

National Curriculum Objectives	Sticky Knowledge	Vocabulary
• Understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions. • Create and debug simple programs • Use logical reasoning to predict the behaviour of simple programs • Recognise common uses of information technology beyond school	• Understand that an algorithm is a set of clear, precise and ordered instructions • A computer programme is the implementation of an algorithm on a digital device • To start to understand what code is and how to read and use this	Enact, command, purpose, series, sequence, combine, programme, device, robot, run, steps memory, clear, direction, forwards, backwards, distance, debug, design I can statements: • I can predict the outcome of a command on a device • I can list what commands can be used on a given device • I can run a command on a floor robot • I can choose a command for a given purpose • I can choose a series of words that can be enacted as a programme • I can choose a series of commands that can run as a programme • I can build a sequence of commands in steps • I can combine commands in a programme • I can run a programme on a device.
Prior Learning	**Key Question(s):**	**Future Learning**
In EYFS Children should: • Safely use and explore a variety of tools • To be confident to try new activities and show independence. • To explain the reason for rules	• What is an algorithm? • Where can algorithms be found? • Have you used algorithms? • When have you used algorithms? • How can algorithms help us? • Why would you want to use an algorithm? • What benefits can algorithms offer? • What is differences between an algorithm and a code?	In Year 2 Children will: • Learn to sequence instructions • Use logical reasoning to predict outcomes • Use given commands in different orders to investigate how the order effects the outcome • Learn about design in programming • Learn about art work and test this for use in a programme • Design algorithms and then test these as programmes and debug these.

<table>
<tr><th colspan="3">Year 1 – Data and Information – Grouping Data (from National Centre for Computing Education)</th></tr>
<tr><th>National Curriculum Objectives</th><th>Sticky Knowledge</th><th>Vocabulary</th></tr>
<tr><td rowspan="3">Use technology purposefully to create, organise, sort, manipulate and retrieve digital content
Use technology safely and respectfully</td><td rowspan="3">Objects can be counted
Information can be presented and in different ways</td><td>Label, group, search, data, information, assign, image, present, collect, attribute</td></tr>
<tr><td>I can statements:</td></tr>
<tr><td>I can some attributes of an object
I can collect simple data
I can show that simple data can be counted
I can describe the properties of an object
I can explain how objects can be grouped by attribute
I can group objects by attribute or in answer to a question
I can recognise that information can be presented in different ways</td></tr>
<tr><th>Prior Learning</th><th>Key Question(s):</th><th>Future Learning</th></tr>
<tr><td>In EYFS Children should:
Safely use and explore a variety of tools
To be confident to try new activities and show independence
Explain the reasons for rules</td><td>How can you count objects?
Are there different ways to sort them?
How would you sort them?
What is an attribute?
What is data?
How would you present this information?
Does that differ from your peers?</td><td>In Year 2 Children will:
Begin to understand what the term data means, and how data can be collected in the form of a tally chart
Learn the term attribute, and use this to help them organise data
Present data in the form of pictograms and block diagrams
Use the data presented to answer questions</td></tr>
</table>

<table>
<tr><th colspan="3">Year 1 – Creating Media – Digital Writing (from National Centre for Computing Education)</th></tr>
<tr><th>National Curriculum Objectives</th><th>Sticky Knowledge</th><th>Vocabulary</th></tr>
<tr><td rowspan="3">• Use technology purposefully to create, organise, sort, manipulate and retrieve digital content
• Use technology safely and respectfully, keeping personal information private</td><td rowspan="3">• Keyboards are used to enter text into a computer
• The Shift key changes the output of a key
• Text can be edited, and its appearance changed</td><td>Shift, punctuation, character, letter, number, space, delete, undo, backspace, select, shortcut, drag, toolbar, font, typeface</td></tr>
<tr><td>I can statements:</td></tr>
<tr><td>• I can use letter, number and space keys to enter text into a computer
• I can use punctuation and special characters
• I can use the backspace key to remove text
• I can position the cursor within the text, and I can select the text
• I can change the appearance of text, and choose an option to achieve the desired outcome
• I can consider the impact of my choices</td></tr>
<tr><th>Prior Learning</th><th>Key Question(s):</th><th>Future Learning</th></tr>
<tr><td>In EYFS Children should:
• Safely use and explore a variety of tools
• To be confident to try new activities and show independence</td><td>• How can you change the appearance of text?
• Are there shortcuts that can be used?
• What happens if you double-click a word?
• If I wanted to select a sentence, how would I do it?
• Which tool will help me achieve the most appropriate outcome?
• How is writing on a computer different from writing on a piece of paper?
• How can the appearance of text change the meaning?</td><td>In Year 2 Children will:
• Learn to use a computer to make music
• Listen to a variety of pieces of music and consider how music makes them think and feel
• Compare creating music digitally and non-digitally
• Look at patterns and purposefully create music</td></tr>
</table>

Year 1 – Programming B – Programming Animations (from National Centre for Computing Education)		
National Curriculum Objectives	**Sticky Knowledge**	**Vocabulary**
• Understand what algorithms are, how they are implemented as programs on digital devices, and that programmes execute by following precise and unambiguous instructions • Create and debug simple programs • Use logical reasoning to predict the behaviour of simple programs	• Predict the outcome of a command • Explain what a given command does, and to match the command to an outcome • Recognise how to run a command • Recall that a series of instructions can be issued before they are enacted • A sequence of commands can be combined in a program	Pre-sequence, sequence, command, animation, enact, combine, program, device, block I can statements: • I can choose a series of words that can be enacted as a program • I can choose a series of commands that can be run as a program • I can run a program on a device
Prior Learning	**Key Question(s):**	**Future Learning**
In EYFS Children should: • Safely use and explore a variety of tools • To be confident to try new activities and show independence	• What happens when…? • Why did it go wrong? • How can you fix it? • Did it do what you expected it to do? Why? Why not?	In Year 2 Children will: • Begin to understand that sequences of commands have an outcome, and make predictions based on their learning. • Use and modify designs to create their own quiz questions in ScratchJr, and realise these designs in ScratchJr using blocks of code. • Evaluate their work and make improvements to their programming projects.

Year 2 – Computing Systems and Networks – IT Around Us (from National Centre for Computing Education)		
National Curriculum Objectives	**Sticky Knowledge**	**Vocabulary**
• Use technology purposefully to create, organise, store, manipulate, and retrieve digital content • Recognise common uses of information technology beyond school • 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	• Recognise different types of computers used in school • Computers are a type of information technology • Recognise the features of information technology • Know the rules for using information technology • Know the benefits of using information technology	Computers, PCs, laptops, tablets, devices, compatible, scanners, barcode scanners, printers, smart speakers, till, bank card, chip and PIN card reader, traffic light, crossing button, crossing signs I can statements: • I can describe some uses of computers • I can identify information technology in school • I can identify information technology beyond school • I can show how to use information technology safely • I can name some common features of information technology
Prior Learning	**Key Question(s):**	**Future Learning**
In Year 1 Children should have: • Developed their understanding of technology and how it can help them in their everyday lives. • Become familiar with the different components of a computer by developing their keyboard and mouse skills. • Considered how to use technology responsibly.	• Why could you do with this technology? • What benefits can technology give us? • Can technology do everything, or is there still a need for human input? • Does technology make things easier?	In Year 3 Children will: • Develop their understanding of digital devices, with an initial focus on inputs, processes, and outputs. • Compare digital and non-digital devices. • Be introduced to computer networks, including devices that make up a network's infrastructure, such as wireless access points and switches. • Discover the benefits of connecting devices in a network.

<table>
<tr><th colspan="3">Year 2 – Creating Media – Digital Photography (from National Centre for Computing Education)</th></tr>
<tr><th>National Curriculum Objectives</th><th>Sticky Knowledge</th><th>Vocabulary</th></tr>
<tr><td rowspan="2">• Use technology purposefully to create, organise, store, manipulate, and retrieve digital content
• Recognise common uses of information technology beyond school
• 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
ART
• To develop a wide range of art and design techniques in using colour, pattern, texture, line, shape, form, and space</td><td rowspan="2">• Digital devices can capture images using a camera
• How to take a photograph and save it for later
• Recognise the features of a good composition
• Know the effect of light on a photo
• Know that images can be edited and recognise that some images are inaccurate</td><td>Composition, adjust, edit, colour effect, real, fake, lighting, artificial, focus, autofocus, flash, portrait, landscape

I can statements:</td></tr>
<tr><td>• I can capture a digital image
• I can take a photograph in both portrait and landscape format
• I can view photographs on a digital device
• I can decide which photographs to keep
• I can hold the camera still to take a clear photograph, and use the zoom to change the composition of the photograph
• I can consider lighting before taking a photograph
• I can use filters to edit the appearance of a photograph
• I can improve a photograph by retaking it</td></tr>
<tr><th>Prior Learning</th><th>Key Question(s):</th><th>Future Learning</th></tr>
<tr><td>In Year 1 Children should have:
• Developed their understanding of a range of tools used for digital painting.
• Used these tools to create their own digital paintings, while gaining inspiration from a range of artists' work.
• Considered their preferences when painting with and without the use of digital devices.</td><td>• How can you change the composition?
• What benefits are there from taking a photograph in portrait or landscape?
• How can the type of lighting affect a photograph?
• Is the zoom function effective or are there different ways to achieve the same effect?</td><td>In Year 4 Children will:
• Develop their understanding of how digital images can be changed and edited, and how they can then be resaved and reused.
• Consider the impact that editing images can have, and evaluate the effectiveness of their choices.</td></tr>
</table>

Year 2 – Programming A – Robot Algorithms (from National Centre for Computing Education)		
National Curriculum Objectives	**Sticky Knowledge**	**Vocabulary**
• Understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions • Create and debug simple programs • Use logical reasoning to predict the behaviour of simple programs	• A series of instructions is a sequence • Predict the outcome of a program • Series of instructions should be issued before they are enacted • Predict what happens when we change the order of instructions	Instructions, clear, precise, logical reasoning, prediction, design, artefact, outline, route, decompose, trace, outcome, prediction, obstacle I can statements: • I can choose a series of words that can be enacted as a sequence • I can choose a series of instructions that can be run as a program • I can create a program • I can trace a sequence to make a prediction • I can run a program on a device • I can debug a program that I have written
Prior Learning	**Key Question(s):**	**Future Learning**
In Year 1 Children should have: • Been introduced to early programming concepts. • Explored using individual commands, both with other learners and as part of a computer program. • Identified what each command for the floor robot does, and use that knowledge to start predicting the outcome of programs. • Been introduced to the early stages of program design through the introduction of algorithms.	• Can you predict what will happen? • Was your prediction correct? And if not, why not? • Why do computer games feature artwork? • What artwork can you see? • What happens if you put an obstacle within the map? • Can you reprogram the instructions?	In Year 3 Children will: • Be introduced to the programming environment, which will be new to most learners. • Be introduced to a selection of motion, sound, and event blocks which they will use to create their own programs, featuring sequences. • Make a representation of a piano. • Apply stages of program design through this unit.

Year 2 – Data and Information - Pictograms (from National Centre for Computing Education)		
National Curriculum Objectives	**Sticky Knowledge**	**Vocabulary**
• Use technology purposefully to create, organise, store, manipulate and retrieve digital content • 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 Maths • Interpret and construct simple pictograms, tally charts, block diagrams and simple tables • Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity • Ask and answer questions about totalling and comparing categorical data	• Tally charts can be used to collect data • Compare objects that have been grouped by attribute • Tally charts and pictograms should have appropriate headings • Comparison questions need to be constructed • Computer programs can be used to present information in different ways • Computers can be used to present information • Information should not be shared	Tally chart, pictogram, block diagram, pictorial, attributes, organise, attribute, advantage, disadvantage, more than, less than, analysis I can statements: • I can recognise that people, animals and objects can be described by attributes • I can enter data onto a computer • I can use a computer to view data in different formats • I can use pictograms to answer single-attribute questions • I can use a computer to answer comparison questions (graphs, tables)
Prior Learning	**Key Question(s):**	**Future Learning**
In Year 1 Children should have: • Assigned data (images) with different labels in order to demonstrate how computers are able to group and present data. • Learnt that labelling, grouping, and searching are important aspects of data and information. • Practised searching as a common operation in many applications, and have an understanding that to search data, it must have labels.	• What is a tally chart? • What is a pictogram? • How are you going to present your data? • What artwork can you see? • What is an attribute? • What does your data show? • Which has 'more than', which has 'less than'?	In Year 3 Children will: • develop their understanding of attributes (properties) using branching databases to structure data according to different object attributes.

<table>
<tr><th colspan="3">Year 2 – Creating Media – Digital Music (from National Centre for Computing Education)</th></tr>
<tr><th>National Curriculum Objectives</th><th>Sticky Knowledge</th><th>Vocabulary</th></tr>
<tr><td rowspan="2">• Use technology purposefully to create, organise, store, manipulate and retrieve digital content
Music
• Play tuned and untuned instruments musically
• Listen with concentration and understanding to a range of high-quality live and recorded music
• Experiment with, create, select, and combine sounds using the interrelated dimensions of music</td><td rowspan="2">• Computers can be used to play sounds of different instruments
• The same pattern can be represented in different ways
• Compare playing music on instruments with making music on a computer</td><td>Listen, compare, generate, emotion, feeling, pattern, rhythm, trigger, imagination, melody, inspiration, retrieve, review, express</td></tr>
<tr><td>I can statements:
• I can experiment with musical patterns on a computer
• I can experiment with different sounds on a computer
• I can use a computer to create a musical pattern
• I can use a computer to compose a rhythm and a melody on a given theme
• I can use a computer to play the same music in different ways (e.g. tempo)
• I can evaluate a musical composition created on a computer
• I can improve a musical composition created on a computer</td></tr>
<tr><th>Prior Learning</th><th>Key Question(s):</th><th>Future Learning</th></tr>
<tr><td>In Year 1 Children should have:
• An understanding of the various aspects of using a computer to create and manipulate
• Be able to explain which method they prefer and explain their reasoning for choosing this.
• Considered the differences between using a computer to create and not using one</td><td>• What are you feeling?
• What emotion is the composer trying to express?
• What is rhythm?
• What is a rhythm pattern?
• What is a melody?
• Does my melody express what I want it to?
• What can I change to achieve what I want?</td><td>In Year 4 Children will:
• identify the input device (microphone) and output devices (speaker or headphones) required to work with sound digitally.
• discuss the ownership of digital audio and the copyright implications of duplicating the work of others.
• use Audacity to produce a podcast, which will include editing their work, adding multiple tracks, and opening and saving the audio files.
• will evaluate their work and give feedback to their peers.</td></tr>
</table>

<table>
<tr><th colspan="3">Year 2 – Programming B – Programming Quizzes (from National Centre for Computing Education)</th></tr>
<tr><th>National Curriculum Objectives</th><th>Sticky Knowledge</th><th>Vocabulary</th></tr>
<tr><td rowspan="2">• Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions
• Create and debug simple programs
• Use logical reasoning to predict the behaviour of simple programs
• Use technology purposefully to create, organise, store, manipulate and retrieve digital content</td><td rowspan="2">• A series of instructions is a ‘sequence’
• A series of instructions can be issued before they are enacted
• Use logical reasoning to predict the outcome of a program</td><td>Levels of abstraction, sprite, direction, modify, create, project, design, sequence, blocks, design, feature, background</td></tr>
<tr><td>I can statements:
• I can choose a series of words that can be enacted as a sequence
• I can explain what happens when we change the order of instructions
• I can choose a series of commands that can be run as a program
• I can trace a sequence to make a prediction
• I can test a prediction by running the sequence
• I can create and debug a program that I have written
• I can run a program on a device</td></tr>
<tr><th>Prior Learning</th><th>Key Question(s):</th><th>Future Learning</th></tr>
<tr><td>In Year 1 Children should have:
• Been introduced to on-screen programming through ScratchJr.
• Explored the way a project looks by investigating sprites and backgrounds.
• Used programming blocks to use, modify, and create programs.
• Been introduced to the early stages of program design through the introduction of algorithms.</td><td>• What is a sprite?
• How can you change the background design?
• Can you compare your project to your design?
• What features can you add to it?
• Which blocks will meet your design?
• Can you change the outcome of a sequence?</td><td>In Year 3 Children will:
• Begin by moving a sprite in four directions (up, down, left, and right).
• Explore movement within the context of a maze, using design to choose an appropriately sized sprite.
• Be introduced to programming extensions, through the use of Pen blocks.
• Be given the opportunity to draw lines with sprites and change the size and colour of lines.</td></tr>
</table>

Year 3 – Computing systems and networks – Connecting computers (from National Centre for Computing Education)

National Curriculum Objectives	Sticky Knowledge	Vocabulary
• 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 • 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 Art • to improve their mastery of art and design techniques, including drawing, painting and sculpture with a range of materials [for example, pencil, charcoal, paint, clay] Maths • Number and place value: solve number problems and practical problems involving these ideas.	• There are benefits to computer networks • Information passes through multiple connections • A network is made up of a number of components • Devices in a network are connected to one another • Computers can be connected to one another • A digital device is made up of several parts • A computer system can change the way we work • Changes to the process affect the output • An output is produced by a process • A process acts upon the input	Process, input, output, network, device, digital, computer system, connection, switch, server, wireless, access point, infrastructure, functionality I can statements: • I can identify input and output devices • I can explain that a computer system accepts an input and processes it to produce an output • I can explain how a computer network can be used to share information • I can explain the role of a switch, server, and wireless access point in a network • I can identify network devices around me • I can explain how networks can be connected to other networks
Prior Learning	**Key Question(s):**	**Future Learning**
In Year 2 Children should have: • Developed their understanding of what information technology (IT) is and be able to identify examples. • Discussed where they have seen IT in school and beyond, in settings such as shops, hospitals, and libraries. • Investigated how IT improves our world, and they will have learnt about the importance of using IT responsibly.	• What are the benefits of a computer network? • How are the devices connected? • How can information be passed between computers? • Why do we need a network switch? • How do digital devices help us? • How does a digital device work?	In Year 4 Children will: • Apply their knowledge and understanding of networks, to appreciate the internet as a network of networks which need to be kept secure. • Learn that the World Wide Web is part of the internet, and will be given opportunities to explore the World Wide Web for themselves in order to learn about who owns content and what they can access, add, and create. • Evaluate online content to decide how honest, accurate, or reliable it is, and understand the consequences of false information.

Year 3 – Creating Media – Stop-Frame Animation (from National Centre for Computing Education)

National Curriculum Objectives	Sticky Knowledge	Vocabulary
• 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 • Use technology safely, respectfully and responsibly; recognise acceptable / unacceptable behaviour; identify a range of ways to report concerns about content and contact. Literacy • Pupils should be taught to: draft and write by: in narratives, creating settings, characters and plot • Pupils should be taught to: proof-read for spelling and punctuation errors History • The Roman Empire and its impact on Britain	• An animation is made up of a sequence of images • The capturing device needs to be in a fixed position • Smaller movements create a smoother animation • There needs to be consistency in the way we work • Adding other media to an animation has an impact • A project must be exported so it can be shared	Media, enhance, animation, storyboard, capture, fixed position, movement, export, share I can statements: • I can plan an animation using a storyboard • I can set up the work area with an awareness of what will be captured • I can capture an image • I can use the onion skinning tool to review the subject position • I can move a subject between captures • I can review a captured sequence of frames as an animation • I can remove frames to improve an animation • I can add media to enhance an animation • I can review a completed project
Prior Learning	**Key Question(s):**	**Future Learning**
In Year 2 Children should have: • Learnt to recognise that different devices can be used to capture photographs • Gained experience in capturing, editing, and improving photos. • Started to recognise that images they see may not be real.	• How can you make your animation better? • Can you add other media to your animation? • How do you make a small change? • What is your setting? • Who are your characters? • What is your event?	In Year 4 Children will: • Identify the input device (microphone) and output devices (speaker or headphones) required to work with sound digitally. • Discuss the ownership of digital audio and the copyright implications of duplicating the work of others. • Use Audacity to produce a podcast, which will include editing their work, adding multiple tracks, and opening and saving the audio files. • Evaluate their work and give feedback to their peers.

Year 3 – Programming A – Sequencing Sound (from National Centre for Computing Education)

National Curriculum Objectives	Sticky Knowledge	Vocabulary
• Design, write, and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output • Use logical reasoning to explain how some simple algorithms work, and to detect and correct errors in algorithms and programs • 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	• Programs start because of an input • A program includes sequences of commands • The sequence of a program is a process • The order of commands can affect a program's output • Different sequences can achieve the same output • Different sequences can achieve different outputs	Sequence, backdrop, character, combine, sound, motion, block, attribute, appearance, costume I can statements: • I can combine commands in a program • I can build a sequence of commands • I can order commands in a program • I can create a sequence of commands to produce a given outcome
Prior Learning	**Key Question(s):**	**Future Learning**
In Year 2 Children should have: • A good understanding of instructions in sequences and the use of logical reasoning to predict outcomes. • Used given commands in different orders to investigate how the order affects the outcome. • Learnt about design in programming. • Develop artwork and tested it for use in a program. • Designed algorithms and then tested those algorithms as programs and debug them.	• What objects can you identify? • What attributes can you identify? • Which word describes an on-screen action for my plan? • How have you created a sequence of commands? • Does the sequence work? • How do you change the appearance of the sprite?	In Year 4 Children will: • Create programs by planning, modifying, and testing commands to create shapes and patterns. • Use Logo, a text-based programming language.

Year 3 – Data and Information – Branching Databases (from National Centre for Computing Education)		
National Curriculum Objectives	**Sticky Knowledge**	**Vocabulary**
• 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 • Use technology safely, respectfully and responsibly	• There are attributes that you can ask yes/no questions about • An attribute can be chosen to separate objects into two similarly sized groups • A branching database is an identification tool • A data set can be structured using yes/no questions • A well-structured branching database will enable you to identify objects using fewer questions • Different sequences can achieve different outputs • Two levels of a branching database can be related using AND • There are real-world applications for branching databases	Branching, database, identify, structured, application, physical representation, collection, I can statements: • I can create questions with yes/no answers • I can choose questions that will divide objects into evenly sized subgroups • I can repeatedly create subgroups of objects • I can identify an object using a branching database • I can retrieve information from different levels of the branching database
Prior Learning	**Key Question(s):**	**Future Learning**
In Year 2 Children should have: • A good understanding of what the term data means and how data can be collected in the form of a tally chart. • learnt the term 'attribute' and use this to help them organise data. • Presented data in the form of pictograms and finally block diagrams. • Used the data presented to answer questions.	• Can you create a collection of YES/NO questions? • Why do they need to be YES/NO questions? • What attributes are needed to be identified in order to collect data? • Does your identification tool work? • How do you know your branching database works?	In Year 4 Children will: • Consider how and why data is collected over time. • Consider the senses that humans use to experience the environment and how computers can use special input devices called sensors to monitor the environment. • Collect data as well as access data captured over long periods of time. • Look at data points, data sets, and logging intervals. • Spend time using a computer to review and analyse data. • Pose questions and then use data loggers to automatically collect the data needed to answer those questions.

Year 3 – Creating Media – Desktop Publishing (from National Centre for Computing Education)		
National Curriculum Objectives	**Sticky Knowledge**	**Vocabulary**
• Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content • 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	• Text and images can be used together to convey information • Landscape and portrait are two different page orientations • Different layouts can suit different purposes • DTP pages can be structured with placeholders • Different font styles and effects are used for particular purposes • There are benefits of using a DTP application	Page, orientation, placeholder, text, layout, resize, rotate, landscape, portrait, purpose, desktop publishing software, template, I can statements: • I can show that page orientation can be changed • I can add text to a placeholder • I can edit text in a placeholder • I can choose fonts and apply effects to text • I can organise text and image placeholders in a page layout • I can add and remove images to and from placeholders • I can move resize and rotate images • I can review a document
Prior Learning	**Key Question(s):**	**Future Learning**
In Year 2 Children should have: • used a computer to create music. • Listened to a variety of pieces of music and considered how music can make them think and feel. • Compared creating music digitally and non-digitally. • Observed patterns and purposefully create music.	• What are text and images used to convey? • Are there disadvantages to using both text and images to communicate messages? • What can you change about your text? • What is the purpose of your writing? • Does your choice of font etc. make your message impactful?	In Year 4 Children will: • develop their understanding of how digital images can be changed and edited, and how they can then be resaved and reused. • consider the impact that editing images can have, and evaluate the effectiveness of their choices.

Year 3 – Programming B – Events and Actions in Programs (from National Centre for Computing Education)

National Curriculum Objectives	Sticky Knowledge	Vocabulary
• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs • 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	• Programs start because of an input • A program includes sequences of commands • The sequence of a program is a process • The order of commands can affect a program's output • Different sequences can achieve the same output • Different sequences can achieve different outputs	Relationship, action, multiple, duplicate, modify, navigate, extend, PEN, function, feature, analyse, I can statements: • I can build a sequence of commands • I can combine commands in a program • I can order commands in a program • I can create a sequence of commands to produce a given outcome
Prior Learning	**Key Question(s):**	**Future Learning**
In Year 2 Children should have: • Started to gain an understanding that sequences of commands have an outcome, and made predictions based on their learning. • Used and modified designs to create their own quiz questions in ScratchJr, and realised these designs in ScratchJr using blocks of code. • Evaluated their work and make improvements to their programming projects.	• How can the character be moved? • How do you move the character left and right? • How do you duplicate the code for the character to move in different directions? • What extension would you use to draw lines? • What errors are there, and can you correct them?	In Year 4 Children will: • Explore the concept of repetition in programming using the Scratch environment. • Discover similarities between two environments. • Look at the difference between count-controlled and infinite loops, and use their knowledge to modify existing animations and games using repetition. • Design and create a game which uses repetition, applying stages of programming design throughout.

Year 4 – Computing Systems and Networks – The Internet (from National Centre for Computing Education)

National Curriculum Objectives	Sticky Knowledge	Vocabulary
• 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 • 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 • Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. PSHE • Evaluating content for honesty and accuracy	• The World Wide Web is part of the internet • The global interconnection of networks is the internet • The internet enables us to view the World Wide Web • The World Wide Web comprises of websites and web pages	Internet, World Wide Web, website, web page, global, interconnection, I can statements: • I can describe how networks connect to other networks • I can outline how information can be shared via the World Wide Web • I can recognise the need for security on the internet • I can describe how to access the World Wide Web • I can describe the types of content/media that can be added, created, and shared on the World Wide Web • I can explain how the content of the World Wide Web is created, owned, and shared by people • I can describe the current limitations of World Wide Web media • I can evaluate the reliability of content and the consequences of unreliable content • I can explain the benefits of the World Wide Web

Prior Learning	Key Question(s):	Future Learning
In Year 3 Children should have: • developed their understanding of digital devices, with an initial focus on inputs, processes, and outputs. • Compared digital and non-digital devices. • Been introduced to computer networks, including devices that make up a network's infrastructure, such as wireless access points and switches. • Discovered the benefits of connecting devices in a network.	• What is the World Wide Web? • How do you access it? • What is the difference between a webpage and a website? • What are the benefits of the World Wide Web? • How do you stay safe on the World Wide Web? • Who owns the World Wide Web? • How do you know what you are viewing is reliable and accurate?	In Year 5 Children will: • Develop their understanding of computer systems and how information is transferred between systems and devices. • Consider small-scale systems as well as large-scale systems. • Explain the input, output, and process aspects of a variety of different real-world systems. • Discover how information is found on the World Wide Web, through learning how search engines work (including how they select and rank results) and what influences searching, and through comparing different search engines.

Year 4 – Creating Media – Audio Production (from National Centre for Computing Education)

National Curriculum Objectives	Sticky Knowledge	Vocabulary
• Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content • 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 • Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact Science • **Sound:** Find patterns between the volume of a sound and the strength of the vibrations that produced it • **Sound:** Recognise that sounds get fainter as the distance from the sound source increases	• Sound can be recorded • An input device is needed to record sound • Output devices are needed to play audio • Recorded audio can be stored on a computer • Audio can be edited • Sound can be represented visually as a waveform • Audio can be layered so that multiple sounds can be played at the same time • Consider the results of editing choices made	Sound, volume, record, strength, vibrations, track, audio, import, edit, waveform, layered, podcast, I can statements: • I can record sound using a computer • I can play recorded audio • I can import audio into a project • I can delete a section of audio • I can change the volume of tracks in a project
Prior Learning	**Key Question(s):**	**Future Learning**
In Year 3 Children should have: • used a range of techniques to create a stop-frame animation using tablets. • Applied those skills to create a story-based animation. • Added other types of media to their animation, such as music and text.	• What are the input and output devices you are using? • What are their function? • What is a podcast? • How can you combine sounds? And what effect does this have? • How can you develop your podcast?	In Year 5 Children will: • Learn how to create short videos by working in pairs or groups. • Be exposed to topic-based language and develop the skills of capturing, editing, and manipulating video. • Be guided with step-by-step support to take their idea from conception to completion. • Have the opportunity to reflect on and assess their progress in creating a video.

Year 4 – Programming A – Repetition in Shapes (from National Centre for Computing Education)

National Curriculum Objectives	Sticky Knowledge	Vocabulary
• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs • 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	• Identify everyday tasks that include repetition as part of a sequence, eg brushing teeth, dance moves • We can use a loop command in a program to repeat instructions • In programming there are indefinite loops and count-controlled loops • An indefinite loop will run until the program is stopped • You can program a loop to stop after a specific number of times • Identify patterns in a sequence, eg 'step 3 times' means the same as 'step, step, step' • Explain the importance of instruction order in a loop • Not all tools enable more than one process to be run at once	Loop, indefinite, sequence, controlled, concurrency, repetition, annotate, sketch, snippet, Logo commands, repeat, text-based language, chunk I can statements: • I can list an everyday task as a set of instructions including repetition • I can use an indefinite loop to produce a given outcome • I can use a count-controlled loop to produce a given outcome • I can plan a program that includes appropriate loops to produce a given outcome • I can recognise tools that enable more than one process to be run at the same time (concurrency) • I can create two or more sequences that run at the same time
Prior Learning	**Key Question(s):**	**Future Learning**
In Year 3 Children should have: • Explored the concept of sequencing in programming through Scratch. • Been introduced to a selection of motion, sound, and event blocks which they will have used to create their own programs, featuring sequences.	• Why does the code need to be accurate? • What is a code snippet? • Can you create a program in a text-based language? • What does repeat mean? • What is the effect of changing the number of times a task is repeated? • How can a computer can repeatedly call a procedure?	In Year 5 Children will: • Use physical computing to explore the concept of selection in programming through the use of the Crumble programming environment. • Be introduced to a microcontroller (Crumble controller) and learn how to connect and program it to control components (including output devices — LEDs and motors). • Be introduced to conditions as a means of controlling the flow of actions in a program. • Make use of their knowledge of repetition and conditions when introduced to the concept of selection (through the 'if…then…' structure) and write algorithms and programs that utilise this concept. • Will design and make a working model of a fairground carousel that will demonstrate their understanding of how the microcontroller and its components are connected, and how selection can be used to control the operation of the model.

Year 4 – Data and Information – Data Logging (from National Centre for Computing Education)

National Curriculum Objectives	Sticky Knowledge	Vocabulary
• Use sequence, selection, and repetition in programs; work with variables and various forms of input and output • 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 Science • Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. • They should learn how to use new equipment, such as data loggers, appropriately. They should collect data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data.	• Data that can be logged over time • Sensors are input devices • A sensor can be used as an input device for data collection • A data logger captures 'data points' from sensors over time	Data logger, capture, sensor, data point, format, automatic, parallel, interval, regular, I can statements: • I can use a digital device to collect data automatically • I can choose how often to automatically collect data samples • I can use a set of logged data to find information • I can use a computer program to sort data by one attribute • I can export information in different formats
Prior Learning	**Key Question(s):**	**Future Learning**
In Year 3 Children should have: • Developed their understanding of what a branching database is and how to create one. • Used yes/no questions to gain an understanding of what attributes are and how to use them to sort groups of objects. • Created physical and on-screen branching databases. • Created an identification tool using a branching database, which they have tested by using it. They will also have	• What data can be collected? • How can it be collected? • What is a sensor? • How can a sensor be used to collect data? • How can a computer help us to analyse the data? • Can you identify the data needed to answer a question?	In Year 5 Children will: • Learn how a flat-file database can be used to organise data in records. • Use tools within a database to order and answer questions about data. • Create graphs and charts from their data to help solve problems. • Use a real-life database to answer a question, and present their work to others.

considered real-world applications for branching databases.		

Year 4 – Creating Media – Photo Editing (from National Centre for Computing Education)

National Curriculum Objectives	Sticky Knowledge	Vocabulary
• 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 • Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact	• An application can be used to add to the composition of a digital image • An application can be to change part of a digital image • An application can be used to change the whole of a digital image • You can change the composition of a digital image by rotating and flipping • You can change the composition of a digital image by cropping • You can adjust colours of a digital image, apply filters to a digital image, apply effects to a digital image. • You can use clone, copy, and paste to change the composition of a digital image • You can use cloning to retouch a digital image • You can add text to a digital image	Application, digital, clone, copy, resize, cut, paste, crop, adjust, rotate, flip, composition, filter, effect, manipulate, retouch, ethics, publication I can statements: • I can recognise that digital images can be manipulated • I can recognise that digital images can be changed for different purposes • I can choose the most appropriate tool for a particular purpose • I can consider the impact of changes made on the quality of the image
Prior Learning	**Key Question(s):**	**Future Learning**
In Year 3 Children should have: • Become familiar with the terms 'text' and 'images' and understand that they can be used to communicate messages. • Used desktop publishing software and considered careful choices of font size, colour and type to edit and improve premade documents. • Been introduced to the terms 'templates', 'orientation', and 'placeholders' and understand how these can support them in making their own template for a magazine front cover. • Added text and images to create their own pieces of work using desktop publishing software. • Looked at a range of page layouts thinking carefully about the purpose of these and evaluated how and why desktop publishing is used in the real world.	• In what ways can you change a digital image? • What tools would you need to use to alter a digital image? • Can you choose an appropriate effect for a scenario? • Can you explain why you chose that effect? • When is it necessary to edit photos?	In Year 5 Children will: • Start to create vector drawings. • Learn how to use different drawing tools to help them create images. • Recognise that images in vector drawings are created using shapes and lines, and each individual element in the drawing is called an object. • Layer their objects and begin grouping and duplicating them to support the creation of more complex pieces of work.

Year 4 – Programming B – Repetition in Games (from National Centre for Computing Education)

<table>
<tr><th>National Curriculum Objectives</th><th>Sticky Knowledge</th><th>Vocabulary</th></tr>
<tr><td rowspan="2">• Design, write, and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
• Use sequence, selection, and repetition in programs; work with variables and various forms of input and output
• Use logical reasoning to explain how some simple algorithms work, and to detect and correct errors in algorithms and programs
• 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</td><td rowspan="2">• Identify everyday tasks that include repetition as part of a sequence, eg brushing teeth, dance moves
• We can use a loop command in a program to repeat instructions
• In programming there are indefinite loops and count-controlled loops
• An indefinite loop will run until the program is stopped
• You can program a loop to stop after a specific number of times
• Identify patterns in a sequence, eg ‘step 3 times’ means the same as ‘step, step, step’
• Explain the importance of instruction order in a loop
• Not all tools enable more than one process to be run at once</td><td>Infinite loop, count-controlled loop, flag, modify, character, game, evaluate

I can statements:
• I can list an everyday task as a set of instructions including repetition
• I can use an indefinite loop to produce a given outcome
• I can plan a program that includes appropriate loops to produce a given outcome
• I can recognise tools that enable more than one process to be run at the same time (concurrency)
• I can create two or more sequences that run at the same time</td></tr>
<tr><th>Prior Learning</th><th>Key Question(s):</th><th>Future Learning</th></tr>
<tr><td>In Year 3 Children should have:
• Become familiar with the terms ‘text’ and ‘images’ and understand that they can be used to communicate messages.
• Used desktop publishing software and considered careful choices of font size, colour and type to edit and improve premade documents.
• Been introduced to the terms ‘templates’, ‘orientation’, and ‘placeholders’ and understand how these can support them in making their own template for a magazine front cover.
• Added text and images to create their own pieces of work using desktop publishing software.
• Looked at a range of page layouts thinking carefully about the purpose of these and</td><td>• How do you use a loop to create a shape?
• What kind of loops are there?
• What should the repeated action do?
• Is it doing what you want it to do?
• How would you change it?
• Is your repeated sequence effective?
• Can you create a game using your repeated sequence?</td><td>In Year 5 Children will:
• Develop their knowledge of ‘selection’ by revisiting how ‘conditions’ can be used in programming, and then learning how the ‘if… then… else…’ structure can be used to select different outcomes depending on whether a condition is ‘true’ or ‘false’.
• Represent this understanding in algorithms, and then by constructing programs in the Scratch programming environment.
• Learn how to write programs that ask questions and use selection to control the outcomes based on the answers given.
• Use this knowledge to design a quiz in response to a given task and implement it as a program.
• Evaluate their program by identifying how it meets the requirements of the task, the ways they have improved it, and further ways it could be improved.</td></tr>
</table>

evaluated how and why desktop publishing is used in the real world.		

Year 5 – Computing Systems and Networks – Systems and Searching (from National Centre for Computing Education)

National Curriculum Objectives	Sticky Knowledge	Vocabulary
• 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	• A system is a set of interconnected parts which work together • Computers can be connected together to form IT systems • Data can be transferred between IT systems • Recognise inputs, processes, and outputs in large IT systems • Search engines are examples of large IT systems • Search engines create indices, and that they are different for each search engine • Ranking orders search results to make them more useful • Ranking is determined by rules, and that different search engines use different rules • Search engines make money by selling targeted advertising space • Explain the role of web crawlers in creating an index	System, search, engine, indices, rank, rules, web crawler, index, targeted, advertising space, result, influence, refine, physical, electronic, connections, address bar I can statements: • I can describe the input and output of a search engine • I can demonstrate that different search terms produce different results • I can evaluate the results of search terms
Prior Learning	**Key Question(s):**	**Future Learning**
In Year 4 Children should have: • applied their knowledge and understanding of networks, to appreciate the internet as a network of networks which need to be kept secure. • Learnt that the World Wide Web is part of the internet, and have had opportunities to explore the World Wide Web for themselves in order to learn about who owns content and what they can access, add, and create. • Evaluated online content to decide how honest, accurate, or reliable it is, and understood the consequences of false information.	• How can search results be influenced? • What does the rank mean? And how does it affect the results? • What is the role of a search engine? • What is the role of a web crawler? • If you don't find what you are searching for, what can you do? • What two ways can you search?	In Year 6 Children will: • Explore how data is transferred over the internet. • Initially focus on addressing, before they move on to the makeup and structure of data packets. • Look at how the internet facilitates online communication and collaboration. • Complete shared projects online and evaluate different methods of communication. • Learn how to communicate responsibly by considering what should and should not be shared on the internet.

<table>
<tr><th colspan="3">Year 5 – Creating Media – Video Production (from National Centre for Computing Education)</th></tr>
<tr><th>National Curriculum Objectives</th><th>Sticky Knowledge</th><th>Vocabulary</th></tr>
<tr>
<td rowspan="2">• Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
• 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
• Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact
Internet Safety
• Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour</td>
<td rowspan="2">• Explain the features of video as a visual media format
• Explain the purpose of a storyboard
• Recognise which devices can and can't record video
• Filming techniques can be used to create different effects
• You need to regularly review and reflect on a video project
• Videos can be improved through and reshooting or editing
• Videos can be edited on a recording device or on a computer
• Explain the limitations of editing video on a recording device
• Projects need to be exported to be shared</td>
<td>Technique, record, video, limitation, visual media, format, capability, camera angle, reshoot,</td>
</tr>
<tr>
<td>I can statements:
• I can use different camera angles
• I can use pan, tilt and zoom
• I can identify features of a video recording device or application
• I can combine filming techniques for a given purpose
• I can determine what scenes will convey your idea
• I can decide what changes I will make when editing
• I can choose to reshoot a scene or improve later through editing
• I can use split, trim and crop to edit a video</td>
</tr>
<tr><th>Prior Learning</th><th>Key Question(s):</th><th>Future Learning</th></tr>
<tr>
<td>In Year 4 Children should have:
• Identified the input device (microphone) and output devices (speaker or headphones) required to work with sound digitally.
• Discussed the ownership of digital audio and the copyright implications of duplicating the work of others.
• Evaluated their work and give feedback to their peers.</td>
<td>• What makes a video effective?
• What techniques can you employ when filming?
• Can you suggest filming techniques for a given purpose?
• Can you capture video using a range of filming techniques?
• What can you do to improve your video?</td>
<td>In Year 6 Children will:
• Be introduced to creating websites for a chosen purpose.
• Identify what makes a good web page and use this information to design and evaluate their own website using Google Sites.
• Pay specific attention to copyright and fair use of media, the aesthetics of the site, and navigation paths.</td>
</tr>
</table>

Year 5 – Programming A – Selection in Physical Computing (from National Centre for Computing Education)

National Curriculum Objectives	Sticky Knowledge	Vocabulary
• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs • 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	• A condition can only be true or false • A count-controlled loop contains a condition • Compare a count-controlled loop with a condition-controlled loop • A condition-controlled loop will stop when a condition is met • A condition is met a loop will complete a cycle before it stops • Selection can be used to branch the flow of a program • A loop can be used to repeatedly check whether a condition has been met • Explain the importance of instruction order in 'if…then…else…' statements	Condition, statements, flow, cycle, if, then, else, branch, setup, extend, binary, I can statements: • I can create a condition-controlled loop • I can use a condition in an 'if…then…' statement to start an action • I can use selection to switch the program flow in one of two ways • I can use a condition in an 'if…then…else…' statement to produce given outcomes
Prior Learning	**Key Question(s):**	**Future Learning**
In Year 4 Children should have: • Created programs by planning, modifying, and testing commands to create shapes and patterns. • Used Logo, a text-based programming language.	• How are conditions used in selection? • Can you identify and modify conditions in a program? • Can you identify the condition and outcomes in an 'if… then… else…' statement? • How does selection direct the flow of a program? • Are you able to identify problems that occur if answers similar to those in the condition are given as inputs?	In Year 6 Children will: • Explore the concept of variables in programming through games in Scratch. • Find out what variables are and relate them to real-world examples of values that can be set and changed. Then they use variables to create a simulation of a scoreboard. • Experiment with variables in an existing project, then modify them, before they create their own project. • Apply their knowledge of variables and design to improve their games in Scratch.

Year 5 – Data and Information – Flat-File Databases (from National Centre for Computing Education)

National Curriculum Objectives	Sticky Knowledge	Vocabulary
• Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content • 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	• A computer program can be used to organise data • Tools can be used to select data to answer questions • Operands can be used to filter data • Ordering data allows us to answer some questions • 'AND' and 'OR' can be used to refine data selection • Computer programs can be used to compare data visually • We present information to communicate a message	Attribute, criteria, multiple, graph, operands, compare, visual, present, communicate, record, form, field, database, flat-file, parameters, filter I can statements: • I can choose different ways to view data • I can choose which attribute and value to search by to answer a given question (operands) • I can ask questions that need more than one attribute to answer • I can choose which attribute to sort data by to answer a given question • I can choose multiple criteria to search data to answer a given question (AND and OR) • I can select an appropriate graph to visually compare data • I can choose suitable ways to present information to other people
Prior Learning	**Key Question(s):**	**Future Learning**
In Year 4 Children should have: • Considered how and why data is collected over time. • Considered the senses that humans use to experience the environment and how computers can use special input devices called sensors to monitor the environment. • Collected data as well as access data captured over long periods of time. • Looked at data points, data sets, and logging intervals. • Spent time using a computer to review and analyse data. • Posed questions and then used data loggers to automatically collect the data needed to answer those questions.	• What can you use to record information? • What is a field? • What is a record? • What is a database? • How can data be grouped? • Is it possible to combine grouping and sorting to answer specific questions? • What can you use to refine the data selection? • Can you refine a chart?	In Year 6 Children will: • Be supported in organising data into columns and rows to create their own data set. • Be taught the importance of formatting data to support calculations, while also being introduced to formulas and will begin to understand how they can be used to produce calculated data. • Be taught how to apply formulas that include a range of cells, and apply formulas to multiple cells by duplicating them. • Use spreadsheets to plan an event and answer questions. • Create charts, and evaluate their results in comparison to questions asked.

<table>
<tr><th colspan="3">Year 5 – Creating Media – Introduction to Vector Graphics (from National Centre for Computing Education)</th></tr>
<tr><th>National Curriculum Objectives</th><th>Sticky Knowledge</th><th>Vocabulary</th></tr>
<tr><td rowspan="2">• 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.</td><td rowspan="2">• A vector drawing comprises separate objects
• Each object in a drawing is in its own layer
• Vector images can be scaled without impact on quality
• Objects can be modified in groups
• Alignment and size guides can help create a more consistent drawing
• Consider the impact of choices made</td><td>Vector, layer, align, group, ungroup, quality, duplicate,</td></tr>
<tr><td>I can statements:
• I can add an object to a vector drawing
• I can select one object or multiple objects
• I can delete objects
• I can move objects between the layers of a drawing
• I can group and ungroup selected objects
• I can duplicate objects using copy and paste
• I can modify objects
• I can reposition objects
• I can combine options to achieve a desired effect
• I can create a vector drawing for a given purpose</td></tr>
<tr><th>Prior Learning</th><th>Key Question(s):</th><th>Future Learning</th></tr>
<tr><td>In Year 4 Children should have:
• Developed their understanding of how digital images can be changed and edited, and how they can then be resaved and reused.
• Considered the impact that editing images can have, and evaluated the effectiveness of their choices.</td><td>• How are vector drawings made?
• How are vector drawings different from paper based drawings?
• Which shape shave been used to make this image?
• How can you change the objects?
• What is layering?
• What can layering be used to create?
• What does grouping objects do?</td><td>In Year 6 Children will:
• Develop their knowledge and understanding of using a computer to produce 3D models.
• Initially familiarise themselves with working in a 3D space, moving, resizing, and duplicating objects. They will then create hollow objects using placeholders and combine multiple objects to create a model of a desk tidy.
• Examine the benefits of grouping and ungrouping 3D objects, then go on to plan, develop, and evaluate their own 3D model of a building.</td></tr>
</table>

Year 5 – Programming B – Selection in Quizzes (from National Centre for Computing Education)

National Curriculum Objectives	Sticky Knowledge	Vocabulary
• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs • 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	• A condition can only be true or false • A count-controlled loop contains a condition • Compare a count controlled loop with a condition-controlled loop • A condition-controlled loop will stop when a condition is met • When a condition is met a loop will complete a cycle before it stops • Selection can be used to branch the flow of a program • A loop can be used to repeatedly check whether a condition has been met • Explain the importance of instruction order in 'if… then… else…' statements	Environment, selection, condition, I can statements: • I can choose a condition to use in a program • I can create a condition-controlled loop • I can use a condition in an 'if… then…' statement to start an action • I can use selection to switch program flow • I can use 'if… then… else…' to switch program flow in one of two ways
Prior Learning	**Key Question(s):**	**Future Learning**
In Year 4 Children should have: • Explored the concept of repetition in programming using the Scratch environment. • Discovered similarities between two environments. • Looked at the difference between count-controlled and infinite loops, and used their knowledge to modify existing animations and games using repetition. • Designed and created a game which uses repetition, applying stages of programming design throughout.	• What connects a condition to an outcome? • How does the condition inform the outcome? • Can you identify the condition and outcomes in an 'if… then… else…' statement? • Have both outcomes been achieved? • If not, why not?	In Year 6 Children will: • Offers pupils the opportunity to use all of the previously learnt constructs in a different, but still familiar environment, while also utilising a physical device — the micro:bit. • Use a simple program to build in and test within the new programming environment, before transferring it to their micro:bit.

Year 6 – Computing Systems and Networks – Communication and Collaboration (from National Centre for Computing Education)

National Curriculum Objectives	Sticky Knowledge	Vocabulary
• 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 • 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 • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact	• Data is transferred across networks using agreed protocols (methods) • Connections between computers allow access to shared stored files • Data is transferred in packets • Computers connected to the internet allow people in different places to work together • Discuss the opportunities that technology offers for communication and collaboration • Explain which types of media can be shared through the internet • Explain that communicating and collaboration using the internet can be public or private	Protocol, method, transfer, packet, private, public, communicate, collaborate, share, copyright, permission, secure I can statements: • I can outline methods of communicating and collaborating using the internet • I can choose methods of internet communication and collaboration for given purposes • I can evaluate different methods of online communication and collaboration • I can decide what you should and should not share online
Prior Learning	**Key Question(s):**	**Future Learning**
In Year 5 Children should have: • developed their understanding of computer systems and how information is transferred between systems and devices. • Considered small-scale systems as well as large-scale systems. • Explained the input, output, and process aspects of a variety of different real-world systems. • Discovered how information is found on the World Wide Web, and what influences searching, and through comparing different search engines.	• What is data packet? • What are the key parts of a data packet? • What types of data are there? • How can people work collaboratively using the internet? • How does the internet help people communicate? What are the issues surrounding privacy and security?	In Year 7 Children will be: • defining a network and addressing the benefits of networking, before covering how data is transmitted across networks using protocols. The types of hardware required are explained, as is wired and wireless data transmission. • Developing an understanding of the terms 'internet' and 'World Wide Web', and of the key services and protocols used. Practical exercises are included throughout to help strengthen understanding.

Year 6 – Creating Media – Web Page Creation (from National Centre for Computing Education)		
National Curriculum Objectives	**Sticky Knowledge**	**Vocabulary**
• Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content • 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. • Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour.	• Recognise the relationship between HTML and visual display • Web pages can contain different media types • Web pages are written by people • A website is a set of hyperlinked web pages • Recognise components of a web page layout • Consider the ownership and use of images (copyright) • There is a need to preview pages (different screens / devices) • There is a need for a navigation path recognise the implications of linking to content owned by others	Navigate, style, embed, preview, insert, hyperlink, HTML, ownership, copyright, fair use, I can statements: • I can review an existing website (navigation bars, header) • I can create a new blank web page • I can add text to a web page • I can change the appearance of text • I can set the style of text on a web page • I can embed media in a web page • I can add web pages to a website • I can preview a web page (different screen sizes) • I can insert hyperlinks between pages • I can insert hyperlinks to another site
Prior Learning	**Key Question(s):**	**Future Learning**
In Year 5 Children should have: • Learnt how to create short videos by working in pairs or groups. • Been exposed to topic-based language and developed the skills of capturing, editing, and manipulating video. • Reflected on and assessed their progress in creating a video.	• What is fair use? • What is meant by the term copyright? • What are the features of a web page? • What does HTML mean? • How can you add things to a web page? • What is a hyperlink? • What is a navigation path? • Why do you need a navigation path?	In Year 7 Children will be: • Concentrating on applying skills that they may have previously learnt as well as those learnt in the unit. • Given clear tasks for which they need to first plan and then implement a solution.

Year 6 – Programming A – Variables in Games (from National Centre for Computing Education)

National Curriculum Objectives	Sticky Knowledge	Vocabulary
• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs • 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	• A 'variable' as something that is changeable • Identify examples of information that is variable, for example, a football score during a match • A variable can be used in a program, eg 'score' • A program variable as a placeholder in memory for a single value • A variable has a name and a value, and the value of a variable can be used by a program • The value of a variable can be updated • identify that variables can hold numbers (integers) or letters (strings) • A variable can be set as a constant (fixed value) • Explain the importance of setting up a variable at the start of a program (initialisation) • There is only one value for a variable at any one time • If you change the value of a variable, you cannot access the previous value (cannot undo) • If you read a variable, the value remains • The name of a variable is meaningless to the computer and needs to be unique	Experiment, existing, variable, control, conditional statement, place holder, value, unique, constant, integer, string, initialisation, fixed, I can statements: • I can identify a variable in an existing program • I can experiment with the value of an existing variable • I can choose a name that identifies the role of a variable to make it easier for humans to understand it • I can decide where in a program to set a variable • I can update a variable with a user input • I can use an event in a program to update a variable • I can use a variable in a conditional statement to control the flow of a program • I can use the same variable in more than one location in a program
Prior Learning	**Key Question(s):**	**Future Learning**
In Year 5 Children should have: • Used physical computing to explore the concept of selection in programming through the use of the Crumble programming environment. • Been introduced to a microcontroller (Crumble controller) and learnt how to connect and program it to control components (including output devices — LEDs and motors). • Been introduced to conditions as a means of controlling the flow of actions in a program. • Made use of their knowledge of repetition and conditions when introduced to the concept of selection (through the	• What is a variable? • How do we name a variable? • What is an example of information that is a variable? • Why is a variable used in a program? • Can you use variables to improve something? • Can you use variables to extend something?	In Year 7 Children will be: • Building confidence and knowledge of the key programming constructs. • Expanding on their knowledge throughout the unit.

'if...then...' structure) and written algorithms and programs that utilise this concept. • Designed and made a working model of a fairground carousel that demonstrated their understanding of how the microcontroller and its components are connected, and how selection can be used to control the operation of the model.		

<table>
<tr><th colspan="3">Year 6 – Data and Information – Introduction to Spreadsheets (from National Centre for Computing Education)</th></tr>
<tr><th>National Curriculum Objectives</th><th>Sticky Knowledge</th><th>Vocabulary</th></tr>
<tr>
<td rowspan="2">• 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
Maths
• Solve problems involving addition, subtraction, multiplication, and division
• Interpret and construct pie charts and line graphs, and use these to solve problems
• Calculate and interpret the mean as an average</td>
<td rowspan="2">• Questions can be answered using spreadsheet data
• Explain what an item of data is in a spreadsheet
• There are different software tools to work with data
• The data type determines how a spreadsheet can process the data
• Formulas can be used to produce calculated data
• Cells can be linked
• Explain why data should be organised in a spreadsheet
• A cell's value automatically updates when the value in a linked cell is changed
• Evaluate results in comparison to the question asked</td>
<td>Formula, operation, calculate, function, cell, linked, software, data, item,</td>
</tr>
<tr>
<td>I can statements:
• I can calculate data using a formula for each operation
• I can use functions to create new data
• I can use existing cells within a formula
• I can choose suitable ways to present spreadsheet data</td>
</tr>
<tr><th>Prior Learning</th><th>Key Question(s):</th><th>Future Learning</th></tr>
<tr>
<td>In Year 5 Children should have:
• Looked at how a flat-file database can be used to organise data in records.
• Used tools within a database to order and answer questions about data.
• Created graphs and charts from their data to help solve problems.
• Used a real-life database to answer a question, and presented their work to others.</td>
<td>• Where do you input data?
• What mathematical operations can you perform?
• What is a range of cells?
• How do you create formulas?
• What can you use spreadsheets for?
• How can you use spreadsheets to present data?</td>
<td>In Year 7 Children will be:
• Able to confidently model data with a spreadsheet.
• Engaging in activities to progress learners from using basic formulas to writing their own COUNTIF statements.
• Gaining a good set of skills that they can use in computing lessons and in other subject areas.</td>
</tr>
</table>

Year 6 – Creating Media – 3D Modelling (from National Centre for Computing Education)

National Curriculum Objectives	Sticky Knowledge	Vocabulary
• 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 • Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact Art • To improve their mastery of art and design techniques, including drawing, painting, and sculpture with a range of materials D&T • Generate, develop, model, and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design Maths • Recognise, describe, and build simple 3D shapes, including making nets	• 3D models can be created on a computer • A 3D environment can be viewed from different perspectives • Digital tools can be used to manipulate 3D objects • Placeholders can create holes in 3D objects • Artefacts can be broken down into a collection of 3D objects	Model, 3D, position, modify, combine, artefact, construct, perspective, placeholder, manipulate, work plane, I can statements: • I can position 3D shapes relative to one another • I can use digital tools to modify 3D objects • I can combine objects to create a 3D digital artefact • I can use digital tools to accurately size 3D objects • I can construct a 3D model which reflects a real world object
Prior Learning	**Key Question(s):**	**Future Learning**
In Year 5 Children should have: • Started to create vector drawings. • Learnt how to use different drawing tools to help them create images. • Recognised that images in vector drawings are created using shapes and lines, and each individual element in the drawing is called an object. • Layered their objects and began grouping and duplicating them to support the creation of more complex pieces of work.	• How many dimensions can you work in on a computer? • How can you modify a 3D object? • For what purpose would you create a 3D model? • Can you combine objects to make a 3D model?	In Year 7 Children will be: • Developing their understanding of information technology and digital literacy skills. • Using the skills learnt across the unit to create a blog post about a real-world cause that they would like to gain support for. • Developing software formatting skills and explore concerns surrounding the use of other people's work, including licensing and legal issues.

Year 6 – Programming B – Sensing Movement (from National Centre for Computing Education)

National Curriculum Objectives	Sticky Knowledge	Vocabulary
• Design, write, and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs • 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	• A 'variable' as something that is changeable • Identify examples of information that is variable, e.g. a football score during a match • A variable can be used in a program, e.g. 'score' • A program variable as a placeholder in memory for a single value • A variable has a name and a value • The value of a variable can be used by a program, and the value of the variable can be updated • Variables can hold numbers (integers) or letters (strings) • A variable can be set as a constant (fixed value) • Explain the importance of setting up a variable at the start of a program (initialisation) • There is only one value for a variable at any one time • If you change the value of a variable, you cannot access the previous value (cannot undo) • If you read a variable, the value remains • The name of a variable is meaningless to the computer and the name needs to be unique	Update, event, conditional statement, emulator I can statements: • I can identify a variable in an existing program • I can experiment with the value of an existing variable • I can choose a name that identifies the role of a variable to make it more usable (to humans) • I can decide where in a program to set a variable • I can update a variable with a user input • I can use an event in a program to update a variable • I can use a variable in a conditional statement to control the flow of a program • I can use the same variable in more than one location in a program
Prior Learning	**Key Question(s):**	**Future Learning**
In Year 5 Children should have: • Developed their knowledge of 'selection' by revisiting how 'conditions' can be used in programming, and learnt how the 'if… then… else…' structure can be used to select different outcomes depending on whether a condition is 'true' or 'false'. • Represented this understanding in algorithms, and then by constructing programs in the Scratch programming environment. • Learnt how to write programs that ask questions and used selection to control the outcomes based on the answers given.	• What is an operand? And when can you use it? • What is a controllable device? • How do you determine the flow of a program? • How do you control the flow of a program? • What is an emulator?	In Year 7 Children will be: • Building on their understanding of the control structures' sequence, selection, and iteration (the big three), and develop their problem-solving skills. • Learning how to create their own subroutines, develop their understanding of decomposition, learn how to create and use lists, and build upon their problem-solving skills by working through a larger project at the end of the unit.

• Used this knowledge to design a quiz in response to a given task and implement it as a program. • Evaluated their program by identifying how it meets the requirements of the task, the ways they have improved it, and further ways it could be improved.		