



# Bricknell Primary School

Computing Long Term Plan



## Computing Long Term Overview

Year Group	Autumn	Spring	Summer
EYFS			
1	Technology around us	Digital Painting Moving a robot Grouping Data	Digital Writing Programming Animations
2	Information Technology Around Us	Digital Photography Robot Algorithms Pictograms	Making Music An Introduction to Quizzes
3	Connecting Computers	Stop-frame Animation Sequence in music Branching databases	Desktop publishing Events and actions
4	The Internet	Audio editing Repetition in shapes Data logging	Photo editing Repetition in games
5	Sharing Information	Video editing Selection in physical computing	Flat-file databases Vector drawing drawings Selection in quizzes
6	Communication	Web page creation Variables in games Introduction to spreadsheets	3D Modelling Sensing

## As computing students in EYFS, we will learn...

<b>Overview</b>	In EYFS, there is no discrete content which relates to Computing. However, In readiness for KS1, pupils are exposed to a range of technology that develop key skills, knowledge and confidence. This technology is incorporated into the continuous provision in the EYFS environment. The pupils have access to PCs to develop mouse and keyboard skills; floor robots that prepare pupils for the KS1 coding curriculum, digital cameras and audio recording devices that enable pupils to create digital content.
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# As computing students in Year 1, we will learn...

	<b>Animal Kingdom</b> 	<b>Once Upon a Time</b> 	<b>Magic, Mystery and Mayhem</b> 
<b>Prior Knowledge</b>	<b>Pupils should be able to:</b> Use a mouse, use a keyboard, be able to open a program	<b>Pupils should be able to:</b> Use a mouse, use a keyboard, be able to open a program  Give a series of commands, Understand directions	<b>Pupils should be able to:</b> Use a mouse, use a keyboard, be able to open a program  Create a series of commands, understand directions, know that programs can go wrong
<b>Key Vocabulary</b>	<b>Mouse, keyboard, key edit, text, delete, space bar, return</b>	<b>Tools, save, mouse, keyboard, image</b>  <b>Command, sequence, program,</b>  <b>Data, label, property, compare, propret</b>	<b>Keys, text, delete, edit, font, bold</b>  <b>Command, animation, sprite, series, sequence, value</b>
<b>Key Concepts</b>	<b>Computing systems and networks:</b> (systems, networks and how they are used, the internet, hardware and software)	<b>Creating media</b>  <b>Programming</b>  <b>Data and information</b>	<b>Creating media</b>  <b>Programming</b>
<b>Key learning intentions</b>	<p style="text-align: center;"><i>Technology around us</i></p> I can identify technology I can identify a computer and its main parts I can use a mouse in different ways I can use a keyboard to type I can use the keyboard to edit text	<p style="text-align: center;"><i>Digital Painting</i></p> I can describe what different freehand tools do I can use the shape tool and the line tools I can make careful choices when painting a digital picture I can explain why I chose the tools I used I can use a computer on my own to paint a picture  <p style="text-align: center;"><i>Moving a robot</i></p> I can explain what a given command will do I can act out a given word I can combine forwards and backwards commands to make a sequence I can combine four direction commands to make sequences I can plan a simple program  <p style="text-align: center;"><i>Grouping Data</i></p> I can label objects I can identify that objects can be counted I can describe objects in different ways I count object with the same properties I can compare groups of objects	<p style="text-align: center;"><i>Digital Writing</i></p> I can use a computer to write I can add and remove text on a computer I can identify that the look of text can be changed on a computer I can make careful choices when changing text I can explain why I used the tools that I chose  <p style="text-align: center;"><i>Programming Animations</i></p> I can choose a command for a given purpose I can show that a series of commands can be joined together I can identify the effect of changing a value I can explain that each sprite has its own instructions I can design the parts of a project
<b>Second order concepts</b>	Written and oral expression: (Using computing terminology, using technology to support and improve communication, using technology to presenting and interpreting data, digital media)	<b>Written and oral expression:</b> (Using computing terminology, using technology to support and improve communication, using technology to presenting and interpreting data, digital media)  <b>Cause and consequence:</b> (inputs and outputs, programming)  <b>Written and oral expression</b>	<b>Written and oral expression:</b> (Using computing terminology, using technology to support and improve communication, using technology to presenting and interpreting data, digital media)  <b>Cause and consequence:</b> (inputs and outputs, programming)

# As computing students in Year 2, we will learn...

	Fire, Fear and Fury	Blue Planet	Valiant Victorians
<b>Prior Knowledge</b>	This unit progresses learners' understanding of technology and how they interact with it.	<p>This unit begins the learners' understanding of how photos are captured and can be manipulated for different purposes. Following this unit, learners will develop their photo editing skills in Year 4.</p> <p>Learners should have experience of making choices on a tablet/computer, and they should be able to navigate within an application. Learners should also have some experience of patterns.</p> <p>This unit will introduce learners to data and information. It will introduce learners to the concept of labelling and grouping objects based on their properties. Learners will develop their understanding that objects can be given labels, which is fundamental to their future learning concerning databases and spreadsheets. In addition, learners will begin to improve their ability to use dragging and dropping skills on a device. Following this unit, in year 2, learners will present data graphically in pictograms.</p>	<p>Learners should have experience of making choices on a tablet/computer, and they should be able to navigate within an application. Learners should also have some experience of patterns.</p> <p>In advance of the lessons in this Year 2 unit, pupils should have had some experience of creating short programs and predicting the outcome of a simple program. This unit progresses students' knowledge and understanding of algorithms and how they are implemented as programs on digital devices. Pupils will spend time looking at how the order of commands affects outcomes. Pupils will use this knowledge and logical reasoning to trace programs and predict outcomes.</p>
<b>Key Vocabulary</b>	Network, server, router, internet provider, hardware, software, technology	<p>Digital, image, landscape, portrait, framing, edit, scale, composition, light source, adjust</p> <p>Algorithm, sequence, input, output,</p> <p>Command, outcome, precise, instruction, combine, sequence, program, prediction, debugging</p> <p>Data, organisation, compare, attribute, tally, most/least, conclusion</p>	<p>Rhythm, pattern, sequence, percussion, pitch, duration, melody,</p> <p>Command, outcome, precise, instruction, combine, sequence, program, prediction, debugging, sprite, algorithm</p>
<b>Key Concepts</b>	Computing systems and networks	<p>Creating media</p> <p>Programming</p> <p>Data and information</p>	<p>Creating media</p> <p>Programming</p>
<b>Key learning intentions</b>	<p><i>Information Technology Around Us</i></p> <p>I can recognise the uses and features of information technology            I can identify information technology in the home            I can identify information technology beyond school            I can explain how information technology benefits us            I can show how to use information technology safely</p>	<p><i>Digital Photography</i></p> <p>I can use a digital device to take a photograph            I can make choices when taking a photograph            I can describe what make a good photograph            I can decide how photographs can be improved            I can use tools to change an image</p> <p><i>Robot Algorithms</i></p> <p>I can describe a series of instructions as a sequence            I can explain what happens we change the order of instructions            I can use logical reasoning to predict the outcome of a program (series of commands)            I can explain that programming project can have code and artwork            I can design an algorithm</p> <p><i>Pictograms</i></p> <p>I can recognise that we can count and compare objects using tally charts            I can recognise that objects can be represented as pictures            I can create a pictogram            I can select objects by attribute and make comparisons            I can recognise that people can be described by attributes</p>	<p><i>Making Music</i></p> <p>I can say how music makes me feel            I can identify that there are patterns in music            I can describe how music can be used in different ways            I can show how music is made from a series of notes            I can create music for a purpose</p> <p><i>An Introduction to Quizzes</i></p> <p>I can explain that a sequence of commands has a start            I can explain that a sequence of commands has an outcome            I can create a program using a given design            I can change a given design            I can create a program using my own design</p>
<b>Second order concepts</b>	Written and oral expression: (Using computing terminology, using technology to support and improve communication, using technology to presenting and interpreting data, digital media)	<p><b>Written and oral expression:</b> (Using computing terminology, using technology to support and improve communication, using technology to presenting and interpreting data, digital media)</p> <p><b>Cause and consequence:</b> (inputs and outputs, programming)</p> <p><b>Written and oral expression</b></p>	<p><b>Written and oral expression:</b> (Using computing terminology, using technology to support and improve communication, using technology to presenting and interpreting data, digital media)</p> <p><b>Cause and consequence:</b> (inputs and outputs, programming)</p>

# As computing students in Year 3, we will learn...

	The Greatest Show	The Land Before Time 	Games, Gods and Greeks
<b>Prior Knowledge</b>	This unit progresses learners' knowledge and understanding of technology by focusing on digital and non-digital devices, and introducing the concept of computers connected together as a network. Following this unit, learners will explore the internet as a network of networks.	<p>This unit progresses students' knowledge and understanding of using digital devices to create media, exploring how they can create stop-frame animations. Following this unit, learners will further develop their video editing skills in Year 5.</p> <p>This unit assumes that learners will have some prior experience of programming; the KS1 NCCE units cover floor robots and ScratchJr. However, experience of other languages or environments may also be useful.</p> <p>This unit progresses students' knowledge and understanding of presenting information. It builds on their knowledge of data and information from key stage 1. They continue to develop their understanding of attributes and begin to construct and interrogate branching databases as a means of displaying and retrieving information.</p>	This unit progresses learners' knowledge and understanding of using digital devices to combine text and images building on work from the following units; Digital Writing Year 1, Digital painting Year 1, and Digital Photography Year 2.
<b>Key Vocabulary</b>	<b>Network, server, router, internet provider, hardware, software, technology, input, output, digital device, share</b>	<b>Frame, stop-frame, flip-book, storyboard, sequence</b>  <b>Sequence, block-code, Scratch, code, motion, event, program, sprite, backdrop, project, save</b>  <b>Object, group, arrange, branching, attribute, efficiency, pictogram</b>	<b>Text, image, message, publish, return, backspace, shift, template, orientation, app, layout</b>  <b>Command, outcome, precise, instruction, combine, sequence, program, prediction, debugging, sprite, algorithm</b>
<b>Key Concepts</b>	<b>Computing systems and networks:</b> (systems, networks and how they are used, the internet, hardware and software)	<b>Programming</b>  <b>Creating media</b>  <b>Data and information</b>	<b>Creating media</b>  <b>Programming</b>
<b>Key learning intentions</b>	<p><i>Connecting Computers</i></p> <p>I can explain how digital devices function            I can identify input and output devices            I can recognise how digital devices can change the way we work            I can explain how a computer network can be used to share information            I can explore how digital devices can be connected</p>	<p><i>Stop-frame Animation</i></p> <p>I can explain that animation is a sequence of drawings or photographs            I can relate animated movement with a sequence of images            I can plan an animation            I can identify the need to work consistently and carefully            I can review and improve an animation</p> <p><i>Sequence in music</i></p> <p>I can explore a new programming environment            I can identify that commands have an outcome            I can explain that a program has a start            I can recognise that a sequence of command can have an order            I can change the appearance of my project</p> <p><i>Branching databases</i></p> <p>I can create questions with yes/no answers            I can identify the object attributes needed to collect relevant data            I can create a branching database            I can explain why it is helpful for a database to be well structured            I can identify objects using a branching database</p>	<p><i>Desktop publishing</i></p> <p>I can recognise how text and images convey information            I can recognise that text and layout can be edited            I can choose appropriate page settings            I can add content to a desktop publishing publication            I can consider how different layouts can suit different purposes</p> <p><i>Events and actions</i></p> <p>I can explain how a sprite moves an existing project            I can create a program to move a sprite in four directions            I can adapt a program to a new context            I can develop my program by adding features            I can identify and fix bugs in a program</p>
<b>Second order concepts</b>	Written and oral expression: (Using computing terminology, using technology to support and improve communication, using technology to presenting and interpreting data, digital media)	<b>Written and oral expression:</b> (Using computing terminology, using technology to support and improve communication, using technology to presenting and interpreting data, digital media)  <b>Similarity and difference and Written and oral expression</b>  <b>Written and oral expression:</b>	<b>Written and oral expression:</b> (Using computing terminology, using technology to support and improve communication, using technology to presenting and interpreting data, digital media)  <b>Cause and consequence:</b> (inputs and outputs, programming)

# As computing students in Year 4, we will learn...

	As the Bomb Drops	Settlements	Egypt and the Shang Dynasty
<b>Prior Knowledge</b>	This unit progresses students' knowledge and understanding of networks in Year 3. In Year 5, they will continue to develop their knowledge and understanding of computing systems and online collaborative working.	<p>This unit progresses students' knowledge and understanding of creating media, by focusing on the recording and editing of sound to produce a podcast. Following this unit, learners will explore combining audio with video in the 'Video editing' unit in Year 5.</p> <p>This unit progresses students' knowledge and understanding of programming. It progresses from the sequence of commands in a program to using count-controlled loops. Pupils will create algorithms and then implement those algorithms as code.</p> <p>This unit progresses pupils' knowledge and understanding of data and how it can be collected over time to answer questions. The unit also introduces the idea of automatic data collection.</p>	Learners should have experience of making choices on a tablet/computer. They should be able to navigate within an application.  This unit assumes that learners will have some prior experience of programming. The KS1 NCCE units cover floor robots and ScratchJr, and Scratch is introduced in the Year 3 programming units. However, experience of other languages or environments may also be useful.
<b>Key Vocabulary</b>	<b>Network, router, world wide web , devive, web page</b>	<b>Record, audio, output, podcast, save, file, volume, audio file</b>  <b>Sequence, block-code, Scratch, code, motion, event, program, sprite, backdrop, project, save</b>  <b>Object, group, arrange, branching, attribute, efficiency, pictogram</b>	<b>Digital, image, landscape, portrait, framing, edit, scale, composition, light source, adjust, retouching, fake, real</b>  <b>Sequence, block-code, Scratch, code, motion, event, program, sprite, backdrop, project, save, loop, repetition, input, output</b>
<b>Key Concepts</b>	<b>Computing systems and networks:</b> (systems, networks and how they are used, the internet, hardware and software)	<b>Creating media</b>  <b>Programming</b>  <b>Data and information</b>	<b>Creating media</b>  <b>Programming</b>
<b>Key learning intentions</b>	<p><i>The Internet</i></p> <p>I can describe how networks physically connect to other networks  I can recognise how networked devices make up the internet  I can outline how websites can be shared via the World Wide Web (WWW)  I can describe how can content can be added and accessed on the World Wide Web (WWW)  I can recognise how the content of the WWW is created by people</p>	<p><i>Audio editing</i></p> <p>I can identify that sound can be digitally recorded  I can use a digital device to record sound  I can explain that a digital recording is stored as a file  I can explain that audio can be changed through editing  I can show that different types of audio can be combined and played together</p> <p><i>Repetition in shapes</i></p> <p>I can identify that accuracy in programming is important  I can create a program in a text-based language  I can explain what 'repeat' means  I can modify a count-controlled loop to produce a given outcome  I can decompose a task into small steps</p> <p><i>Data logging</i></p> <p>I can explain that data gathered over time can be used to answer questions  I can use a digital device to collect data automatically  I can explain that a data logger collects 'data points' from sensors over time  I can use data collected over a long duration to find information  I can identify data needed to answer questions</p>	<p><i>Photo editing</i></p> <p>I can explain that digital images can be changed  I can change the composition of an image  I can describe how images can be changed for different uses  I can make good choices when selecting different tools  I can recognise that not all images are real</p> <p><i>Repetition in games</i></p> <p>I can develop the use of count-controlled loops in a different programming environment  I can explain that in programming there are infinite loops and count-controlled loops  I can develop a design that includes two or more loops which run at the same time  I can modify an infinite loop in a given program  I can design a project that includes repetition</p>
<b>Second order concepts</b>	Written and oral expression: (Using computing terminology, using technology to support and improve communication, using technology to presenting and interpreting data, digital media)	<b>Written and oral expression:</b> (Using computing terminology, using technology to support and improve communication, using technology to presenting and interpreting data, digital media)  <b>Cause and consequence:</b> (inputs and outputs, programming)  <b>Written and oral expression</b>	<b>Written and oral expression:</b> (Using computing terminology, using technology to support and improve communication, using technology to presenting and interpreting data, digital media)  <b>Cause and consequence:</b> (inputs and outputs, programming)

# As computing students in Year 5, we will learn...

	Around the World	Reach for the Stars	Looking Back, going Forward
<b>Prior Knowledge</b>	This unit progresses learners' knowledge and understanding of computing systems and online collaborative working.	This unit progresses learners' knowledge and understanding of creating media by guiding them systematically through the process involved in creating a video. The unit builds on the Year 4 unit 'Photo editing' where composition is introduced and the Year 3 unit 'Stop-frame animation' where learners explored some of the features of video production. By the end of this unit, learners will have developed the skills required to plan, record, edit, and share a video.  This unit assumes that learners will have prior experience of programming using a block-based language (eg Scratch) and understand the concepts of sequence and repetition. The National Centre for Computing Education key stage 1 units focus on floor robots and ScratchJr, however, experience of other languages or environments may also be useful.	This unit progresses pupils' knowledge and understanding of why and how information might be stored in a database, and looks at how tools within a database can help us to answer questions about our data. It moves on to demonstrate how a database can help us display data visually, and how real-life databases can be used to help us solve problems. Finally, the pupils create a presentation showing understanding and application of all the tools used within the unit.  This unit progresses students' knowledge and understanding of digital painting and has some links to desktop publishing in which learners used digital images. They are now creating the images that they could use in desktop publishing documents.  This unit assumes that learners will have prior experience of programming using block-based construction (eg Scratch), understand the concepts of 'sequence' and 'repetition', and have some experience of using 'selection'. Ideally, learners will have completed 'Programming A – Selection in physical computing' before undertaking this unit, as this will provide them with the required knowledge of 'selection'.
<b>Key Vocabulary</b>	<b>Network, server, router, internet provider, hardware, software, technology, input, output, digital device, share</b>	<b>Video, edit, angle, frame, storyboard, scene, software, export</b>  <b>Sequence, block-code, Scratch, code, motion, event, program, sprite, backdrop, project, save, loop, repetition, input, output</b>	<b>Object, group, arrange, branching, attribute, efficiency, pictogram</b>  <b>Line, shape tool, object, move, resize, rotate, selection, duplicate, zoom, copy, paste</b>  <b>Sequence, block-code, Scratch, code, motion, event, program, sprite, backdrop, project, save, loop, repetition, input, output, loop, repetition</b>
Key Concepts	<b>Computing systems and networks:</b> (systems, networks and how they are used, the internet, hardware and software)	<b>Creating media</b>  <b>Programming</b>	<b>Data and information</b>  <b>Creating media</b>  <b>Programming</b>
<b>Key learning intentions</b>	<i>Sharing Information</i>  I can explain that computers can be connected together to form systems I can recognise the role of computer systems in our lives I can recognise how information is transferred over the internet I can explain how sharing information online lets people in different places work together I can contribute to a shared project online	<i>Video editing</i>  I can explain what makes a video effective I can use a digital device to record video I can capture video using a range of techniques I can create a storyboard I can identify that video can be improved through reshooting and editing  <i>Selection in physical computing</i>  I can control a simple circuit connected to a computer I can write a program that includes count-controlled loops I can explain that a loop can stop when a condition is met e.g. number of times I can conclude that a loop can be used to repeatedly check whether a condition has been met I can design a physical project that includes selection	<i>Flat-file databases</i>  I can use a form to record information I can compare paper and computer-based databases I can outline how grouping and then sorting data allows us to answer questions I can explain that tools can be used to select specific data I can explain that computer programs can be used to compare data visually  <i>Vector drawing</i>  I can identify that drawing tools can be used to produce different outcomes I can create a vector drawing by combining shapes I can use tools to achieve a desired effect I can recognise that vector drawings consist of layers I can group objects to make them easier to work with  <i>Selection in quizzes</i>  I can explain how selection is used in computer programs I can relate that a conditional statement connects a condition to an outcome I can explain how selection directs the flow of a program I can design a program which uses selection I can create a program which uses selection
<b>Second order concepts</b>	Written and oral expression: (Using computing terminology, using technology to support and improve communication, using technology to presenting and interpreting data, digital media)	<b>Written and oral expression:</b> (Using computing terminology, using technology to support and improve communication, using technology to presenting and interpreting data, digital media)  <b>Cause and consequence:</b> (inputs and outputs, programming)	<b>Written and oral expression:</b> (Using computing terminology, using technology to support and improve communication, using technology to presenting and interpreting data, digital media)  <b>Cause and consequence:</b> (inputs and outputs, programming)

# As computing students in Year 6, we will learn...

	<b>Invasion, Injustice and Invention</b>	<b>Our Incredible Earth</b>	<b>Lights, Camera, Action</b>
<b>Prior Knowledge</b>	This unit progresses students' knowledge and understanding of computing systems and online collaborative working.	This unit progresses students' knowledge and understanding of the following: digital writing, digital painting, desktop publishing, digital photography, photo editing, and vector drawing.  This unit assumes that pupils will have some prior experience of programming in Scratch. Specifically, they should be familiar with the programming constructs of sequence, repetition, and selection. These constructs are covered in the Year 3, 4, and 5 National Centre for Computing Education programming units respectively. Each year group includes at least one unit that focuses on Scratch.  This unit progresses students' knowledge and understanding of data, and teaches them how to organise and modify data within spreadsheets.	This unit progresses students' knowledge and understanding of creating 3D graphics using a computer. Prior to undertaking this unit, learners should have worked with 2D graphics applications.  This unit is the final KS2 programming unit and brings together elements of all the four programming constructs: sequence from year 3, repetition from year 4, selection from year 5 and variables, introduced in year 6, programming A. It offers learners the opportunity to use all of these constructs in a different, but still familiar environment whilst also utilising a physical device - the micro:bit. The unit begins with a simple program which learners build in and test in the programming environment before transferring it to their micro:bit. Learners then take on three new projects in lessons 2, 3 and 4, with each lesson adding more depth.
<b>Key Vocabulary</b>			
Key Concepts	<b>Computing systems and networks:</b> (systems, networks and how they are used, the internet, hardware and software)	<b>Creating media</b> <b>Programming</b> <b>Data and information</b>	<b>Creating media</b> <b>Programming</b>
<b>Key learning intentions</b>	<i>Communication</i>  I can identify how to use a search engine I can describe how search engines select results I can explain how search results are ranked I can recognise why the order of results is important, and to whom I can recognise how we communicate using technology	<i>Web page creation</i>  I can review an existing website and consider its structure I can plan the features of a web page I can consider the ownership and use of images (copyright) I can recognise the need to preview pages I can outline the need for a navigation path  <i>Variables in games</i>  I can define a 'variable' as something that is changeable I can explain why a variable is used in a program I can choose how to improve a game using variables I can design a project that builds on a given examples I can use my design to create a project  <i>Introduction to spreadsheets</i>  I can identify questions which can be answered using data I can explain that objects can be described using data I can explain that formulas can be used to produce calculated data I can apply formulas to data, including duplicating I can create a spreadsheet to plan an event	<i>3D Modelling</i>  I can use a computer to create and manipulate 3D digital objects I can compare working digitally with 2D and 3D graphics I can construct a digital 3D model of a physical object I can identify that physical objects can be broken down into a collection of 3D shapes I can design a digital model by combining 3D objects  <i>Sensing</i>  I can create a program to run on a controllable device I can explain that selection can control the flow of a program I can update a variable with a user input I can use a conditional statement to compare a variable to a value I can design a project that uses inputs and outputs on a controllable device
<b>Second order concepts</b>	Written and oral expression: (Using computing terminology, using technology to support and improve communication, using technology to presenting and interpreting data, digital media)	<b>Written and oral expression:</b> (Using computing terminology, using technology to support and improve communication, using technology to presenting and interpreting data, digital media)  <b>Cause and consequence:</b> (inputs and outputs, programming)  <b>Written and oral expression</b>	<b>Written and oral expression:</b> (Using computing terminology, using technology to support and improve communication, using technology to presenting and interpreting data, digital media)  <b>Cause and consequence:</b> (inputs and outputs, programming)