**Computing**

**Skills and Knowledge Progression**

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| **Computing - EYFS** |
| **Area Link** | **Key Idea** | **Associated Behaviours and Skills** |
| **Art, Design and Technology** | Children talk about processes when exploring their own creativity. They use recording devices and create digital images and animation. | * Make choices when being creative that include the use of technological equipment.
* Explore ways in which technology can be used to create digital content, including sound, writing and drawing.
* Begin to create digital content; text, drawing, pictures and sound using simple digital applications.
* Edit simple text size, font and colour.
* Capture digital and still images including using magnification and investigating the effect of light.
* Edit the content and appearance of digital images using simple software or apps.
* Use simple graphics and drawing/painting software/apps and tools to create digital drawings.
* Investigate, listen and respond to a range of digital sound and music on varied devices, comparing this to live sound.
* Capture their own sound and share with others.
* Create simple tunes using digital resources.
* Use simple software with speech support to help with reading.
* Discuss similarities and differences in using digital and non-digital media and share what they have discovered.
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| **Book and Reading** | Children play phonics games on devices. They record sound effects for storytelling, and use CDs and other sound technologies. | * Realise that technology can be used to support a reading experience.
* Be able to operate equipment.
* Engage in open-ended activities through exploring cause and effect.
* Focus on an activity for a length of time.
* Explore ways in which technology can be used to create digital content, including writing and drawing.
* Begin to create digital content; text, drawing, pictures and sound using simple digital applications.
* Discuss similarities and differences in using digital and non-digital books and share what they have discovered.
* Be able to choose a regular activity on a safe site via a hyperlink or icon.
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| **Construction** | Children take photographs and use sound recorders. They use technology to research and find out about structures, and use instructional language. | * Show satisfaction when printing plans, designs or photographs of completed models.
* Engage in an open-ended activity using different technological resources such as a digital camera, sound recorder etc.
* Persist with activities when challenges occur.
* Show that they can use simple instructional language to control simple on screen and physical devices and explore and investigate digital toys.
* Demonstrate the ability to operate the computer using different devices and input methods, including using a mouse, touch pad, buttons, switches and touch screen with increasing accuracy and independence.
* Recognise that technology can be used to make things happen.
* Investigate real, play and pretend digital devices and explain how they think they work.
* Understand that applications have specific functions and often need to be used in a certain order.
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| **Fine Motor** | Children develop mouse skills and fine motor skills through using controls on technology devices. | * Show satisfaction and pride when using a piece of equipment effectively
* Check they are using appropriate techniques to achieve a desired outcome.
* Demonstrate the ability to persist when challenges occur.
* Edit simple text size, font and colour.
* Edit the content and appearance of digital images using simple software.
* Use simple graphics and drawing/painting software and tools to create digital drawings.
* To be able to use simple instructional language to play robots and to control simple on screen and physical devices.
* Explore and investigate digital toys.
* Develop skills to control the computer using different devices and input methods including use of mouse, touch pad, buttons, switches and touch screen with increasing accuracy and independence.
* Explore and find out that different things happen based on the choice made.
* Know that technology can be used to make things happen.
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| **Graphics** | Children use apps and software to create graphics. They develop typing skills and print their work. They develop their computing vocabulary. | * Realisation that technology can be used to support a writing experience.
* Ability to operate equipment.
* Demonstrate that they can engage in activities exploring cause and effect.
* Focus on an activity for a length of time.
* Recognise a range of technology is used in places such as homes and schools.
* Begin to share their experiences of technology at home and school.
* Engage in conversations about digital applications and respond using appropriate vocabulary.
* Use a broad range of simple devices and applications appropriately with increasing independence.
* Select an appropriate device for a chosen activity.
* Use various keyboards (onscreen and physical), increasingly able to locate and type letters and numbers.
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| **Investigation** | Children use technology to collect data and present information. | * Showing active participation and interest when collecting data during a survey.
* Show curiosity when using the equipment and resources.
* Taking the initiative when deciding which resources to use
* Record results of investigations.
* Show, discuss and record an awareness of changes.
* To know that different types of information can be searched using a range of digital and non-digital sources.
* Find out information using simple navigation tools like arrows, onscreen instructions, icons, buttons, (talk about hyperlinks.)
* Explore devices that monitor sound, light or temperature and make links to their own senses.
* Explore and build simple onscreen pictograms with support.
* Discuss the information displayed.
* Select and use technology for particular purposes.
* With increasing independence, type their first name, adding to digital work and beginning to use in logging on to the school network.
* To know that technology can be used to find out.
* Print work with support, talk about why we choose to print.
* Save work with support, talk about why we choose to save.
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| **Music** | Children make sounds and music using technology. They develop vocabulary to describe sounds. | * Exploring new ways of making music and combining sounds.
* Demonstrate that they understand cause and effect.
* Show preferences when listening to different types of music or when making sounds using technological equipment.
* Explore their creative skills when using equipment to create sounds and their own compositions.
* Show pride in their achievements when presenting music they have composed to others.
* Investigate, listen and respond to a range of digital sound and music on varied devices, comparing this to live sound (rhyme, sound, stories, and songs).
* Capture their own sound and share with others.
* Create simple tunes using digital resources.
* Discuss similarities and differences in using digital and non-digital sounds and share what they have discovered.
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| **Role Play** | Children incorporate technology into their role-play, e.g. a cash till. They use instructional language and explore programmable devices such as floor robots. | * Show that they understand the uses of technology by incorporating props into their play.
* Develop their imaginative role play by using technological devices.
* Develop imaginative role play and recognise what the character might say or feel.
* Show pride and confidence when developing imaginative play supported by props related to technology.
* Talking about their activity and role play and sequencing their activity.
* Use a karaoke device to sing to a tune on an outdoor stage or picnic.
* To be able to use simple instructional language to play robots and to control simple on screen and physical devices.
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| **Small World Area** | Children use sound devices to record and play back appropriate sounds to enhance imaginative play. They explore digital toys and programmable devices, using instructional language and programming sequences. | * Use computing skills and equipment to record the representation of their experiences and imaginative creations.
* Independently accessing technological equipment to enhance their imaginative play.
* To be able to use simple instructional language to play robots and to control simple on screen and physical devices.
* Explore and investigate digital toys.
* Explore virtual worlds and compare these with real life situations or observations.
* Capture images of their small world and add text, sound, music or drawing.
* Create music and record this for impact.
* Use physical sensing devices and apps to recognise changes around them can be recorded and monitored.
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| **Maths Area** | Children use simple software to explore numbers and sort objects. They use sound devices to record themselves talking about numbers, shapes and objects. | * Make choices when exploring an online number environment.
* Begin to create digital content; numbers with pictures / painting- recording their voice describing a shape in a photo album, creating a digital image on an interactive whiteboard.
* Drag and drop objects to help sort and sequence.
* Label missing numbers on a number line.
* Use pen tools to show their understanding of shapes and numbers.
* Use paint to create one- to- one correspondence between drawings and numbers.
* Investigate, listen and respond to a range of digital sound and music on varied devices, comparing this to live sound.
* Capture their own sound and share with others.
* Create graphs and pictograms by entering (inputting) their data and talking about the pictograms and graphs created.
* Use simple software with speech support to help with number recognition.
* Discuss similarities and differences in using digital and non-digital media and share what they have discovered.
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| **Computing - Autumn Term**  |
| **Year 1** | **Year 2** | **Year 3** |
| **Computing Systems and Networks/Technology around us.****Creating Media/ Digital Painting*** Begin to explore digital texts, using varied devices and software to create digital content.
* Investigate differences between input and output and hardware and software.
* Explore the idea of a network related to computers at home and school, logging on to their area with support.
* Use unplugged computing approaches to explore the devices they use.
* Consider eSafe practice.
* Describe what different freehand tools do.
* Use the shape tool and the line tools
* Make careful choices when painting a digital picture
* Explain why I chose the tools I used
* Use a computer on my own to paint a picture
* Compare painting a picture on a computer and on paper
 | **Computing systems and networks – IT around us****Creating Media Digital Photography*** Recognise the uses and features of information technology
* Identify the uses of information technology in the school
* Identify information technology beyond school
* Explain how information technology helps us
* Explain how to use information technology safely
* Recognise that choices are made when using information technology
* Use a digital device to take a photograph
* Make choices when taking a photograph
* Describe what makes a good photograph
* Decide how photographs can be improved
* Use tools to change an image
* Recognise that photos can be changed
 | **Computing systems and networks – Connecting computers****Creating Media/ Animation*** Explain how digital devices function
* Identify input and output devices
* Recognise how digital devices can change the way we work
* Explain how a computer network can be used to share information
* Explore how digital devices can be connected
* Recognise the physical components of a network
* Explain that animation is a sequence of drawings or photographs
* Relate animated movement with a sequence of images
* Plan an animation
* Identify the need to work consistently and carefully
* Review and improve an animation
* Evaluate the impact of adding other media to an animation
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| **Skills*** Use logical reasoning to predict the behaviour of simple programs
* 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.
 | **Skills*** 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.
 | **Skills*** 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
* 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.
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| **Computing - Spring Term**  |
| **Year 1** | **Year 2** | **Year 3** |
| **Creating Media/ Digital Writing****Data and Information/ Grouping Data*** Build eSafe practice.
* Use a computer to write
* Add and remove text on a computer
* Identify that the look of text can be changed on a computer
* Make careful choices when changing text
* Explain why I used the tools that I chose
* Compare typing on a computer to writing on paper
* Label objects
* Identify that objects can be counted
* Describe objects in different ways
* Count objects with the same properties
* Compare groups of objects
* Answer questions about groups of objects
 | **Creatin Media/ Making Music****Data and Information Pictograms*** Develop eSafe practice.
* Say how music can make us feel
* Identify that there are patterns in music
* Show how music is made from a series of notes
* Show how music is made from a series of notes
* Create music for a purpose
* Review and refine our computer work
* Recognise that we can count and compare objects using tally charts
* Recognise that objects can be represented as pictures
* Create a pictogram
* Select objects by attribute and make comparisons
* Recognise that people can be described by attributes
* Explain that we can present information using a computer
 | **Programming/ Sequence in Music****Data and Information/ Branching Databases*** Explore a new programming environment
* Identify that commands have an outcome
* Explain that a program has a start
* Recognise that a sequence of commands can have an order
* Change the appearance of my project
* Create a project from a task description
* Create questions with yes/no answers
* Identify the object attributes needed to collect relevant data
* Create a branching database
* Explain why it is helpful for a database to be well structured
* Identify objects using a branching database
* Compare the information shown in a pictogram with a branching database
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| **Computing - Summer Term**  |
| **Year 1** | **Year 2** | **Year 3** |
| **Programming Moving a Robot****Programming Introduction to animation*** Explain what a given command will do
* Act out a given word
* Combine forwards and backwards commands to make a sequence
* Combine four direction commands to make sequences
* Plan a simple program
* Find more than one solution to a problem
* Choose a command for a given purpose
* Show that a series of commands can be joined together
* Identify the effect of changing a value
* Explain that each sprite has its own instructions
* Design the parts of a project
* Use my algorithm to create a program
 | **Programming/ Robot Algorithms****Programming/ An Introduction to Quizzes*** Describe a series of instructions as a sequence
* Explain what happens when we change the order of instructions
* Use logical reasoning to predict the outcome of a program (series of commands)
* Explain that programming projects can have code and artwork
* Design an algorithm
* Create and debug a program that I have written
* Explain that a sequence of commands has a start
* Explain that a sequence of commands has an outcome
* Create a program using a given design
* Change a given design
* Create a program using my own design
* Decide how my project can be improved

  | **Creating Media/ Desktop Publishing****Programming/ Events and Actions*** Recognise how text and images convey information
* Recognise that text and layout can be edited
* Choose appropriate page settings
* Add content to a desktop publishing publication
* Consider how different layouts can suit different purposes
* Consider the benefits of desktop publishing
* Explain how a sprite moves in an existing project
* Create a program to move a sprite in four directions
* Adapt a program to a new context
* Develop my program by adding features
* Identify and fix bugs in a program
* Design and create a maze-based challenge
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| **Skills*** 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
* 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
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| **Computing - Autumn Term**  |
| **Year 4** | **Year 5** | **Year 6** |
| **Computing Systems and Networks/ The Internet****Creating Media/ Audio Editing*** Describe how networks physically connect to other networks
* Recognise how networked devices make up the internet
* Outline how websites can be shared via the World Wide Web (WWW)
* Describe how content can be added and accessed on the World Wide Web (WWW)
* Recognise how the content of the WWW is created by people
* Evaluate the consequences of unreliable content
* Identify that sound can be digitally recorded
* Use a digital device to record sound
* Explain that a digital recording is stored as a file
* Explain that audio can be changed through editing
* Show that different types of audio can be combined and played together
* Evaluate editing choices made
 | **Computing Systems and Networks/ Sharing Information****Creating Media/ Video Editing*** Explain that computers can be connected together to form systems
* Recognise the role of computer systems in our lives
* Recognise how information is transferred over the internet
* Explain how sharing information online lets people in different places work together
* Contribute to a shared project online
* Evaluate different ways of working together online
* Explain what makes a video effective
* Identify digital devices that can record video
* Capture video using a range of techniques
* Create a storyboard
* Identify that video can be improved through reshooting and editing
* Consider the impact of the choices made when making and sharing a video
 | **Computing Systems and Networks/ Communication****Creating Media/ Web Page Creation*** Identify how to use a search engine
* Describe how search engines select results
* Explain how search results are ranked
* Recognise why the order of results is important, and to whom
* Recognise how we communicate using technology
* Evaluate different methods of online communication
* Review an existing website and consider its structure
* Plan the features of a web page
* Consider the ownership and use of images (copyright)
* Recognise the need to preview pages
* Outline the need for a navigation path
* Recognise the implications of linking to content owned by other people
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| **Skills*** 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.
 | **Skills*** Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
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|  **Computing - Spring Term**  |
| **Year 4** | **Year 5** | **Year 6** |
| **Programming/ Repetition in Shapes****Data and Information/ Data Logging*** Identify that accuracy in programming is important
* Create a program in a text-based language
* Explain what ‘repeat’ means
* Modify a count-controlled loop to produce a given outcome
* Decompose a task into small steps
* Create a program that uses count-controlled loops to produce a given outcome
* Explain that data gathered over time can be used to answer questions
* Use a digital device to collect data automatically
* Explain that a data logger collects ‘data points’ from sensors over time
* Use data collected over a long duration to find information
* Identify the data needed to answer questions
* Use collected data to answer questions
 | **Programming/ Selection in Physical Computing****Data and Information/ Flat File Databases*** Control a simple circuit connected to a computer
* Write a program that includes count-controlled loops
* Explain that a loop can stop when a condition is met
* Explain that a loop can be used to repeatedly check whether a condition has been met
* Design a physical project that includes selection
* Create a program that controls a physical computing project
* Use a form to record information
* Compare paper and computer-based databases
* Outline how grouping and then sorting data allows us to answer questions
* Explain that tools can be used to select specific data
* Explain that computer programs can be used to compare data visually
* Apply my knowledge of a database to ask and answer real-world questions
 | **Programming/ Variables in Games****Data and Information/ Spreadsheets*** Define a ‘variable’ as something that is changeable
* Explain why a variable is used in a program
* Choose how to improve a game by using variables
* Design a project that builds on a given example
* Use my design to create a project
* Evaluate my project
* Identify questions which can be answered using data
* Explain that objects can be described using data
* Explain that formulas can be used to produce calculated data
* Apply formulas to data, including duplicating
* Create a spreadsheet to plan an event
* Choose suitable ways to present data
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| **Skills*** Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
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| **Computing - Summer Term**  |
| **Year 4** | **Year 5** | **Year 6** |
| **Creating Media/ Photo Editing****Programming/ Repetition in Games*** Explain that digital images can be changed
* Change the composition of an image
* Describe how images can be changed for different uses
* Make good choices when selecting different tools
* Recognise that not all images are real
* Evaluate how changes can improve an image
* Develop the use of count-controlled loops in a different programming environment
* Explain that in programming there are infinite loops and count controlled loops
* Develop a design that includes two or more loops which run at the same time
* Modify an infinite loop in a given program
* Design a project that includes repetition
* Create a project that includes repetition
 | **Creating Media/ Vector Drawing****Programming/ Selection in Quizzes*** Identify that drawing tools can be used to produce different outcomes
* Create a vector drawing by combining shapes
* Use tools to achieve a desired effect
* Recognise that vector drawings consist of layers
* Group objects to make them easier to work with
* Evaluate my vector drawing
* Explain how selection is used in computer programs
* Relate that a conditional statement connects a condition to an outcome
* Explain how selection directs the flow of a program
* Design a program which uses selection
* Create a program which uses selection
* Evaluate my program
 | **Creating Media/ 3D Modelling****Programming/ Sensing*** Use a computer to create and manipulate three-dimensional (3D) digital objects
* Compare working digitally with 2D and 3D graphics
* Construct a digital 3D model of a physical object
* Identify that physical objects can be broken down into a collection of 3D shapes
* Design a digital model by combining 3D objects
* Develop and improve a digital 3D model
* Create a program to run on a controllable device
* Explain that selection can control the flow of a program
* Update a variable with a user input
* Use an conditional statement to compare a variable to a value
* Design a project that uses inputs and outputs on a controllable device
* Develop a program to use inputs and outputs on a controllable device
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