

Computing – Progression of Knowledge, Skills and Understanding					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Computing Systems and Networks					
KS1 NC Statements covered in this area		KS2 NC Statements covered in this area			
<p>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.</p>		<p>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</p>			
<p>Explain that technology is something that can help us and give examples. Identify examples of technology. Recognise that a computer is an example of technology. Choose a piece of technology to do a job. Recognise that some technology can be used in different ways. Identify the main parts of a computer. Recognise that choices are made when using technology. Explain why rules are needed when using technology. Use a mouse in different ways. Use a keyboard to type and edit text. Show how to use technology safely.</p>	<p>Recognise different types of computers used in school. Identify that a computer is a part of information technology. Describe some uses of computers. Recognise the features of information technology. Identify information technology in school and beyond school. Talk about uses of information technology. Say how rules for using information technology can help us. Explain how information technology benefits us. Recognise that choices are made when using information technology. Show how to use information technology safely.</p>	<p>Describe what an input and output is and identify them. Explain that a process acts on the inputs and that an output is produced by the process. Explain that a computer system accepts an input and processes it to produce an output. Explain how computer systems can change the way that we work. Identify how changing the process can affect the output. Recognise that a digital device is made up of several parts. Identify how devices in a network are connected with one another. Recognise that a network is made up of a number of components. Explain how a computer network can be used to share information. Explain the role of a switch, server, and a wireless access point in a network. Explain how information is passed through multiple connections. Identify the benefits of computer networks. Identify network devices around me. Explain how networks can be connected to other networks.</p>	<p>Describe how networks connect to other networks. Outline how information can be shared via the World Wide Web. Describe how to access the World Wide Web. Describe the types of content/media that can be added, created, and shared on the World Wide Web. Explain how the content of the World Wide Web is created, owned, and shared by people. Describe the current limitations of World Wide Web media. Evaluate the reliability of content and the consequences of unreliable content. Recognise that the World Wide Web is part of the internet. Explain that the internet enables us to view the World Wide Web. Explain that the World Wide Web comprises of websites and web pages. Explain the benefits of the World Wide Web. Explain that the global interconnection of networks is the internet. Recognise the need for security on the internet.</p>	<p>Recognise that a system is a set of interconnected parts which work together. Explain that computers can be connected together to form IT systems. Identify that data can be transferred between IT systems. Recognise inputs, processes, and outputs in large IT systems. Describe the role of a particular IT system in their lives. Relate that search engines are examples of large IT systems. Describe the input and output of a search engine. Demonstrate that different search terms produce different results. Explain why search engines create indices, and that they are different for each search engine. Explain the role of web crawlers in creating an index. Explain how search results are selected. Explain that ranking orders search results to make them more useful. Explain how ranking is determined by rules, and that different search engines use different rules. Explain why the order of results is important and to whom. Explain how search engines make money by selling targeted advertising space. Identify some of the limitations of search engines. Evaluate the results of search terms.</p>	<p>Recall how to use a search engine. recognise that there are a number of search engines. Compare the results from different search engines. Demonstrate that different search terms produce different results. Explain that search terms need to be chosen carefully. Explain why search engines exist. define the purpose of an index. Explain why search engines create indexes, and that they are different for each search engine. Explain how search results are selected and the role of web crawlers. Explain that ranking narrows down the search results returned from the index, which makes it more useful. Explain that search results are ordered, and this is known as ranking and explain how ranking is determined by rules, and that different search engines use different rules. Examine the role of the searcher, search engine, and content creator in the searching process. Explain why the order of results is important, and to whom. Evaluate the results of search terms. Identify some of the limitations of search engines and recognise that some information is not searchable. Explain how search engines make money by selling advertising space. Identify that results from search engines can include adverts, and that the adverts can be targeted. Define 'communication' and identify different ways to communicate without technology. Discuss the opportunities that technology offers for communication. List methods of communicating using the internet and choose an appropriate method of internet communication for a given purpose. Evaluate different methods of online communication. Explain which types of media can be shared through the internet. Explain that communicating through the internet can be public or private. Decide what I should/should not share. classify internet Communication by messenger and recipient or audience.</p>

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Programming					
KS1 NC Statements covered in this area			KS2 NC Statements covered in this area		
<p>Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions</p> <p align="center">Create and debug simple programs</p> <p>Use logical reasoning to predict the behaviour of simple programs</p> <p>Use technology purposefully to create, organise, store, manipulate and retrieve digital content</p> <p>Recognise common uses of information technology beyond school</p>			<p align="center">Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</p> <p align="center">Use sequence, selection, and repetition in programs; work with variables and various forms of input and output</p> <p align="center">Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</p> <p>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</p> <p align="center">Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</p> <p>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</p> <p align="center">Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact</p>		
<p>Enact a given word and recall words that Can be enacted.</p> <p>Predict the outcome of a command on a device.</p> <p>List which commands can be used on a given device.</p> <p>Explain what a given command does.</p> <p>Match a command to an outcome.</p> <p>Choose a command for a given purpose.</p> <p>Understand that a program is a set of commands that a computer can run.</p> <p>Choose a series of words that can be enacted as a program.</p> <p>Choose a series of commands that can be run as a program.</p> <p>Build a sequence of commands in steps.</p> <p>Combine commands in a program.</p> <p>Run a command on a floor robot.</p> <p>Recognise how to run a command (press a button).</p> <p>Recall that a series of instructions can be issued before they are enacted.</p> <p>Run a program on a device.</p>	<p>Describe that a series of instructions is a sequence.</p> <p>Choose a series of words that can be enacted as a sequence.</p> <p>Explain what happens when we change the order of instructions.</p> <p>Recall that a series of instructions can be issued before they are enacted.</p> <p>Choose a series of instructions and commands that can be run as a program.</p> <p>Create and debug a program that i have written.</p> <p>Recognise that you can predict the outcome of a program.</p> <p>Use logical reasoning to predict the outcome of a program.</p> <p>Debug a program that i have written.</p> <p>Trace a sequence to make a prediction.</p> <p>Test a prediction by running the sequence.</p> <p>Run a program on a device.</p>	<p>Explain that programs start because of an input.</p> <p>Explain what a sequence is.</p> <p>Identify that a program includes sequences of Commands.</p> <p>Identify that the sequence of a program is a Process.</p> <p>Build a sequence of commands.</p> <p>Combine commands in a program.</p> <p>Order commands in a program.</p> <p>Explain that the order of commands can affect a program's output.</p> <p>Identify that different sequences can achieve the same output.</p> <p>Identify that different sequences can achieve different outputs.</p> <p>Create a sequence of commands to produce a given outcome.</p>	<p>Relate what 'repeat' means.</p> <p>Identify everyday tasks that include repetition as part of a sequence, e.g. Brushing teeth, dance moves.</p> <p>List an everyday task as a set of instructions including repetition.</p> <p>Explain that we can use a loop command in a program to repeat instructions.</p> <p>Identify patterns in a sequence.</p> <p>Identify a loop within a program.</p> <p>Explain that in programming there are Indefinite loops and count-controlled loops.</p> <p>Explain that an indefinite loop will run until the Program is stopped.</p> <p>Use an indefinite loop to produce a given outcome.</p> <p>Explain that you can program a loop to stop after a specific number of times.</p> <p>Identify patterns in a sequence, e.g. 'step 3 times' means the same as 'step, step, step'.</p> <p>Use a count-controlled loop to produce a given outcome.</p> <p>Justify when to use a loop and when not to.</p> <p>Plan a program that includes appropriate loops to produce a given outcome.</p> <p>Explain the importance of instruction order in a Loop.</p> <p>Recognise tools that enable more than one Process to be run at the same time (concurrency).</p> <p>Create two or more sequences that run at the same time.</p> <p>Recognise that not all tools enable more than one process to be run at once.</p>	<p>Explain that a condition can only be true or false.</p> <p>Relate that a count-controlled loop contains a condition.</p> <p>Compare a count-controlled loop with a condition-controlled loop.</p> <p>Explain that a condition-controlled loop will stop when a condition is met.</p> <p>Explain that when a condition is met, a loop Will complete a cycle before it stops.</p> <p>Create a condition-controlled loop.</p> <p>Use a condition in an 'if...then...' statement to start an action.</p> <p>Explain that selection can be used to branch the flow of a program.</p> <p>Use selection to switch the program flow in one of two ways.</p> <p>Explain that a loop can be used to repeatedly check whether a condition has been met.</p> <p>Use a condition in an 'if...then...else...' statement to produce given outcomes.</p> <p>Use 'if... Then... Else...' to switch program flow in one of two ways.</p> <p>Explain the importance of instruction order in 'if...then...else...' statements.</p>	<p>Define a 'variable' as something that is changeable.</p> <p>Identify examples of information that is variable, for example, a football score during a match.</p> <p>Explain that a variable can be used in a program, e.g. 'score'.</p> <p>Define a program variable as a placeholder in Memory for a single value.</p> <p>Explain that a variable has a name and a value.</p> <p>Identify a variable in an existing program.</p> <p>Recognise that the value of a variable can be used by a program.</p> <p>Recognise that the value of a variable can be updated.</p> <p>Experiment with the value of an existing variable.</p> <p>Identify that variables can hold numbers (integers) or letters (strings).</p> <p>Define the way that a variable is changed.</p> <p>Recognise that a variable can be set as a constant (fixed value).</p> <p>Choose a name that identifies the role of a variable to make it easier for humans to understand it.</p> <p>Explain the importance of setting up a variable at the start of a program (initialisation).</p> <p>Decide where in a program to set a variable.</p> <p>Update a variable with a user input.</p> <p>Use an event in a program to update a variable.</p> <p>Use a variable in a conditional statement to Control the flow of a program.</p> <p>Explain that there is only one value for a variable at any one time.</p> <p>Explain that if you change the value of a variable, you cannot access the previous value (cannot undo).</p> <p>Explain that if you read a variable, the value remains.</p> <p>Use the same variable in more than one location in a program.</p> <p>Explain that the name of a variable is meaningless to the computer.</p> <p>Explain that the name of a variable needs to be unique.</p>

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Data and Information					
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<p>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.</p>		<p>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</p>			
<p>Identify some attributes of an object. Identify that objects can be counted. Collect simple data. Show that collected data can be counted. Describe the properties of an object. Choose an attribute to group objects by. Group objects to answer questions. Explain that objects can be grouped by similarities (attribute). Recognise that information can be presented Describe a group of objects (based on commonality). Recognise that information can be presented in different ways.</p>	<p>Use a tally chart to collect data. Recognise that people, animals and objects can be described by attributes. Compare objects that have been grouped by attribute. Construct (complete) a given comparison question e.g. Are there more ___ balls than ___ balls? Show i can enter data onto a computer. Use a computer to view data in different formats. Use pictograms to answer single-attribute questions. Suggest appropriate Headings for tally charts and pictograms. Use a computer to answer comparison questions (graphs, tables). Use a computer program to present information in different ways. Explain that we can present information using a computer. Give simple examples of why some information should not be shared.</p>	<p>Investigate questions with yes/no answers. Identify attributes that you can ask yes/no questions about. Create questions with yes/no answers. Select an attribute to separate objects into two similarly sized groups. Choose questions that will divide objects into evenly sized subgroups. Repeatedly create subgroups of objects. Recognise that a data set can be structured using yes/no questions. Explain that a Well-structured branching database will enable you to identify objects using fewer questions. Explain that a branching database is an identification tool. Identify an object using a branching database. Retrieve information from different levels of the branching database. Relate two levels of a branching database using and. Suggest real-world applications for branching databases.</p>	<p>Suggest questions that can be answered using a table of data. Identify data that can be logged over time. Identify that sensors are input devices. Recognise that a sensor can be used as an input device for data collection. Use a digital device to collect data automatically. Choose how often to automatically collect data samples. Explain that a data logger captures 'data points' from sensors over time. Use a set of logged data to find information. Use a computer program to sort data by one attribute. Export information in different formats.</p>	<p>Explain that a computer program can be used to organise data. Choose different ways to view data. Outline how ordering data allows us to answer some questions. Ask questions that need more than one attribute to answer. Choose which attribute to sort data by to answer a given question. Explain that tools can be used to select data to answer questions. Outline how operands can be used to filter data. Choose which attribute and value to search by to answer a given question (operands). Outline how 'and' and 'or' can be used to refine data selection. Choose multiple criteria to search data to answer a given question (and and or). Explain that computer programs can be used to compare data visually. Select an appropriate graph to visually compare data. Explain that we present information to communicate a message. Choose suitable ways to present information to other people.</p>	<p>Identify questions that can be answered using spreadsheet data. Explain what an item of data is in a spreadsheet. Explain how the data type determines how a spreadsheet can process the data. Outline that there are different software tools to work with data. Explain that formulas can be used to produce calculated data. Calculate data using a formula for each operation. Recognise cells can be linked. Use functions to create new data. Use existing cells within a formula. Recognise that a cell's value automatically updates when the value in a linked cell is changed. Evaluate results in comparison to the question asked. Explain why data should be organised in a spreadsheet. Choose suitable ways to present spreadsheet data.</p>

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Creating Media					
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<p>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.</p>		<p>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</p>			
Digital Painting	Digital Photography	Animation	Photo Editing	Video Editing	Web Page Creation
<p>Explain what different freehand tools do. Create a picture using freehand tools. Recognise computers can be used to create art. Use shape and line tools when precision is needed. Use a range of paint colours. Use the fill tool to colour an enclosed area. Use the undo button to correct a mistake. Recognise a tool can be adjusted to suit my need. Combine a range of tools to create a piece of artwork. Decide when it's appropriate to use each tool. Consider impact of choices made. Compare painting using a computer with painting using brushes.</p>	<p>Recognise that some digital devices can capture images using a camera. Capture a digital image. Talk about how to take a photograph. Recognise that photographs can be saved and viewed later. View photographs on a digital device. Decide which photographs to keep. Recognise that photographs can be change after they have been taken. Recognise that some images are not accurate. Use filters to edit the appearance of a photograph. Take photographs in both landscape and portrait format. Make choices when composing my photograph. Recognise features of 'good' photographs. Identify how a photograph could be improved. Explain the effect of light on a photograph. Consider lighting before taking a photograph. Hold the camera still to take a clear photograph. Use zoom to change the composition of a photograph. Improve a photograph by retaking it.</p>	<p>Explain that an animation is made up of a sequence of images. Identify that a capturing device needs to be in a fixed position. Set up a work area with an awareness of what will be captured. Plan an animation using a storyboard. Capture an image. Use the onion skinning tool to review subject position. Move a subject between captures. Recognise that smaller movements create smoother animation. Explain the need for consistency in working. Review a captured sequence of frames as an animation. Remove frames to improve an animation. Explain the impact of adding other media to an animation. Add media to enhance animation. Review a completed project. Explain that a project must be exported so it can be shared.</p>	<p>Recognise that digital images can be manipulated. Recognise that digital images can be changed for different purposes. Use an application to change the whole of a digital image. Use an application to change part of a digital image. Use an application to add to the composition of a digital image. Change the composition of a digital image by rotating and flipping. Change the composition of a digital image by cropping. Adjust colours of a digital image. Apply filters to a digital image. Apply effects to a digital image. Select part of a digital image. Use clone, copy, and paste to change the composition of a digital image. Use cloning to retouch a digital image. Add text to a digital image. Choose the most appropriate tool for a particular purpose. Consider the impact of changes made on the quality of the image.</p>	<p>Explain the features of video as a visual media format. Recognise which devices can and can't record video. Identify features of a video recording device or application. Use different camera angles. Use pan, tilt and zoom. Explain the purpose of a storyboard. Determine what scenes will convey your idea. Recognise that filming techniques can be used to create different effects. Combine filming techniques for a given purpose. Recognise the need to regularly review and reflect on a video project. Identify videos can be improved through and reshooting or editing. Identify that videos can be edited on a recording device or on a computer. Explain the limitations of editing video on a recording device. Choose to reshoot a scene or improve later through editing. Decide what changes i will make when editing. Use split, trim and crop to edit a video. Recognise projects need to be exported to be shared.</p>	<p>Review an existing website (navigation bars, header). Recognise the relationship between html and visual display. Recognise that web pages can contain different media types. Recognise that web pages are written by people. Consider the ownership and use of images (copyright) Recognise that a website is a set of hyperlinked web pages. Recognise components of a web page layout. Create a new blank web page. Add text to a web page. Set the style of text on a web page. Change the appearance of text. Embed media in a web page. Recognise the need to preview pages (different screens / devices). Preview a web page (different screen sizes). Recognise the need for a navigation path. Add web pages to a website. Insert hyperlinks between pages. Insert hyperlinks to another site. Recognise the implications of linking to content owned by others.</p>
Digital Writing	Making Music	Desktop Publishing	Audio Editing	Vector Drawing	3D Modelling
<p>Recognise that a keyboard is used to enter text into a computer. Use letter, number, and space keys to enter text into a computer. Recognise that the shift key changes the output of a key. Use punctuation and special characters. Recognise that text can be changed. Recognise that text can be edited. Use the backspace key to remove text. Position the text cursor in a chosen location. Use undo. Recognise that the appearance of text can be changed. Select text. Change the Appearance of text on a computer. Choose options to achieve a desired effect. Consider the impact of choices made.</p>	<p>Identify that computers can be used to play sounds of different instruments. Identify that the same pattern can be represented in different ways. Experiment with musical patterns on a computer. Experiment with different sounds on a computer. Compare playing music on instruments with Making music on a computer. Use a computer to create a musical pattern. Use a computer to compose a rhythm and a melody on a given theme. Use a computer to play the same music in different ways (e.g. Tempo). Evaluate a musical composition created on a computer. Improve a musical composition created on a Computer.</p>	<p>Recognise how text and images can be used together to convey information. Define landscape and portrait as two different page orientations. Show that page orientation can be changed. Consider how different layouts can suit different purposes. Recognise that dtp pages can be structured with placeholders. Organise text and image placeholders in a page layout. Add text to a placeholder. Edit text in a placeholder. Recognise how different font styles and effects are used for particular purposes. Choose fonts and apply effects to text. Add and remove images to and from placeholders. Move resize and rotate images. Review a document. Consider the benefits of using a dtp application.</p>	<p>Identify that sound can be recorded. Identify that an input device is needed to record sound. Identify that output devices are needed to play audio. Record sound using a computer. Recognise that recorded audio can be stored on a computer. Recognise that audio can be edited. Recognise that sound can be represented visually as a waveform. Play recorded audio. Import audio into a project. Delete a section of audio. Recognise that audio can be layered so that Multiple sounds can be played at the same time. Change the volume of tracks in a project. Consider the results of editing choices made.</p>	<p>Identify that a vector drawing comprises separate objects. Add an object to a vector drawing. Select one object or choices made multiple objects. Delete objects. Recognise that each object in a drawing is in its own layer. Recognise that vector images can be scaled without impact on quality. Move objects between the layers of a drawing. Duplicate objects using copy and paste. Modify objects. Reposition objects. Group and ungroup selected objects. Recognise that objects can be modified in groups. Explain how alignment and size guides can help Create a more consistent drawing. Combine options to achieve a desired effect. Create a vector drawing for a given purpose. Consider the impact of choices made.</p>	<p>Explain that 3D models can be created on a computer. Position 3D shapes relative to one another. Recognise that a 3D environment can be viewed from different perspectives. Recognise that digital tools can be used to manipulate 3D objects. Use digital tools to modify 3D objects. Combine objects to create a 3D digital artefact. Show how placeholders can create holes in 3D objects. Use digital tools to accurately size 3D objects. Recognise that artefacts can be broken down into a collection of 3D objects. Construct a 3D model which reflects a real world object.</p>