CRA - Progression Grid for Computing (Based on Teach Computing)

The National Curriculum for computing aims to ensure that all pupils:

- can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
- can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
- can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
- are responsible, competent, confident and creative users of information and communication technology.

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study

Foundation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Children recognise that a range of technology is used in places such as homes and schools. They select and use technology for particular purposes. It is important that all staff understand that ICT in early years is not restricted to using a computer or laptop.	**In Key stage 1 pupils will be taught to:**		**In Key stage 2 pupils will be taught to:**			
	1.1: understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions		**2.1:** design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts			
	1.2: create and debug simple programs		**2.2:** use sequence, selection, and repetition in programs; work with variables and various forms of input and output			
	1.3: use logical reasoning to predict the behaviour of simple programs		**2.3:** use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs			
	1.4: use technology purposefully to create, organise, store, manipulate and retrieve digital content		**2.4:** 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			
	1.5: recognise common uses of information technology beyond school		**2.5:** use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content			
	1.6: use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.		**2.6:** 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			
			2.7: use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.			
Online Safety, whilst taught within units where approriate, it will be delievred during Online Safety Week in the Spring Term)						
Digital Literacy - Online Saftey (Twinkl).						
Pupils will be taught about internet safety by: making them aware of what safe use of technology looks like; choosing educational apps and platforms that help them to develop their skills; having conversations and sharing advice with parents to encourage safe online use in the home.	Use technology purposefully to create, organise, store, manipulate and retrieve digital content **in the context of naming and dating a digital self-portrait.**	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 **in the context of looking at how much information we can find out about a person online (digital footprint).**	Use technology safely, respectfully and responsibly; recognise acceptable and unacceptable behaviour; identify a range of ways to report concerns about content and contact **in the context of recognising cyberbullying and how to address it.**	Use technology safely, respectfully and responsibly; recognise acceptable / unacceptable behaviour; identify a range of ways to report concerns about content and contact **in the context of thinking about how online messages can be hurtful and how a hurtful mesage should be responded to.**	Use technology safely, respectfully and responsibly; recognise acceptable / unacceptable behaviour; identify a range of ways to report concerns about content and contact **in the context of identifying and avoiding spam emails and know what to do with them.**	Use technology safely, respectfully and responsibly; recognise acceptable / unacceptable behaviour; identify a range of ways to report concerns about content and contact **in the context of comparing cyberbullying to bullying in person and developing strategies for dealing with online bullying.**
	Use technology safely and respectfully **in the context of searching for appropriate images online**	Use technology safely and respectfully **in the context of finding relevant information about a destination using keywords.**	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 **in the context of understanding how websites use advertisements to promote products.**	Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content **in the context of using search engines accurately.**	Use technology safely, respectfully and responsibly; recognise acceptable/ unacceptable behaviour; identify a range of ways to report concerns about content and contact **in the context of citing the work of others when use the internet for research.**	Use technology safely, respectfully and responsibly; recognise acceptable/ unacceptable behaviour; identify a range of ways to report concerns about content and contact **in the context of identifying secure and unsecure websites by identifying privacy seals of approval.**
	Use technology safely and respectfully **in the context of learning about the SMART rules for Internet safety.**	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 **in the context of identifying appropriate websites for children**	Use technology safely, respectfully and responsibly; recognise acceptable / unacceptable behaviour; identify a range of ways to report concerns about content and contact **in the context of creating strong passwords and understaning / using privacy settings.**	Use technology safely, respectfully and responsibly; recognise acceptable / unacceptable behaviour; identify a range of ways to report concerns about content and contact **in the context of understaning the the term online plagiarism and how to avoid it.**	Use technology safely, respectfully and responsibly; recognise acceptable / unacceptable behaviour; identify a range of ways to report concerns about content and contact **in the context of following rules to help create strong passwords.**	Use technology safely, respectfully and responsibly; recognise acceptable / unacceptable behaviour; identify a range of ways to report concerns about content and contact **in the context of identifying information that is safe and unsafe to share with online friends and understand the benefits and pitfalls of online relationships.**
	Use technology safely and respectfully **in the context of keeping personal information safe.**	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 **in the context of reviewing and rating websites.**	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 technology safely, respectfully and responsibly; recognise acceptable / unacceptable behaviour; identify a range of ways to report concerns about content and contact **in the context of sending and receiving emails safely.**	Use technology safely, respectfully and responsibly; recognise acceptable / unacceptable behaviour; identify a range of ways to report concerns about content and contact **in the context of creating their own sample safe online game account, highlighting information which is acceptable to include**.	Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content **in the context of finding out when, why and how photos can be altered and presented as reality online.**	Use technology safely, respectfully and responsibly. Be discerning in evaluating digital content. Children will work **in the context of evaluating media aimed at boys and girls**.
	Recognise common uses of information technology beyond school **in the context of sending an email.**	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 **in the context identifying cyberbullying (kind and unkind behaviour online)**.	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 technology safely, respectfully and responsibly; recognise acceptable / unacceptable behaviour; identify a range of ways to report concerns about content and contact **in the context of exploring the different ways we communicate online.**	Use technology safely, respectfully and responsibly; recognise acceptable / unacceptable behaviour; identify a range of ways to report concerns about content and contact **in the context of giving examples of how to be a good digital citizen**.	Use technology safely, respectfully and responsibly; recognise acceptable / unacceptable behaviour; identify a range of ways to report concerns about content and contact **in the context of planning a story about the consequences of not following online safety rules (based on real-life scenarios).**	Use technology safely, respectfully and responsibly; recognise acceptable / unacceptable behaviour; identify a range of ways to report concerns about content and contact **in the context of identifying how to behave in a range of online scenarios (applying online safety knowledge).**
	Use technology safely and respectfully **in the context of guiding others to make the right choices online.**	Cyber Snakes and Ladders 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 **in the context of answering questions about online safety and scenarios to complete a game.**	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 **in the context of planning a party online using knowledge of online safety.**	Use technology safely, respectfully and responsibly; recognise acceptable / unacceptable behaviour; identify a range of ways to report concerns about content and contact **in the context of creating an online safety character**.	Use technology safely, respectfully and responsibly; recognise acceptable / unacceptable behaviour; identify a range of ways to report concerns about content and contact **in the context of creating a comic strip about the consequences of not following online safety rules.**	Use technology safely, respectfully and responsibly; recognise acceptable/ unacceptable behaviour; identify a range of ways to report concerns about content and contact **in the context of creating an online safety quiz.** .

Computer Systems and Networks (Teach Computing)

	Technology Around Us	Information Technology Around Us	Connecting Computers	The Internet	Sharing information	Communication
	NC reference: 1.4, 1.5, 1.6	NC reference: 1.4, 1.5, 1.6	NC reference: 2.2, 2.4, 2.6	NC reference: 2.4, 2.5, 2.6, 2.7	NC reference: 2.1, 2.2, 2.4, 2.6, 2.7	NC reference: 2.1, 2.4, 2.5, 2.6, 2.7
Foundation	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Begin to explore different types of technology, including a computer, and understand some of the things it can do.	**Identify** different types of technology and **understand** how it helps us, giving examples.	**Recognise** the uses and features of information technology, identifying that a computer is part if IT.	**Explain** how digital devices function (inputs and outputs) and **follow** a process.	**Describe** how networks physically connect to other networks. **Understand** why a network needs protecting.	**Explain** that computers can be connected together to form systems and that a computer system features inputs, processes and outputs..	**Identify** how to use a search engine to find specific information and **know** how to refine the search. **Compare** results from different search engines.
	Know what a computer is and **identify** its main parts, being able to switch on, log in and use a mouse to click and drag.	**Identify** the uses of information technology in the school through giving examples. **Know** that some IT can be used in more than one way.	**Identify** and **classify** input and output devices and **use** this to design a digital device.	**Understand** how networked devices make up the internet and that it provides many services. **Know** that the World Wide Web (WWW) contains websites and webpages.	**Recognise** the role of computer systems in our lives. **Identify** tasks that are managed by computer systems and **identify** the human elements of a computer system.	**Describe** how search engines select results. **Know** how to relate a search term to the search engine's index. **Recognise** the role of web crawlers.
	Explore using a mouse in different ways e.g. to create a picture and to open a program.	**Identify** information technology beyond school, giving examples, and be able to talk about its uses.	**Understand** how digital devices can change the way we work. **Recognise** similarities and **suggest** differences between using digital devices and non-digital tools.	**Explain** how websites can be shared via the World Wide Web (WWW). **Know** how to access them, where they are stored when uploaded to the WWW and the types of media that can be shared.	**Recognise** how information is transferred over the internet and **understand** that networked digital devices have unique addresses.	**Know** and **explain** how search results are ranked. **Suggest** some of the criteria that a search engine checks to decide on the order of results.
	Explore the purpose of a keyboard and use it to type words and save work.	**Explain** how information technology helps us and **demonstrate** how IT devices work together.	**Explain** how a computer network can be used to share information. **Know** the importance of a network switch and **explain** how messages are passed through multiple connections.	**Describe** how content can be added on the WWW. **Know** that internet services can be used to create content online.	**Explain** how sharing information online lets people in different places work together. **Recognise** that connected digital devices allow us to access shared files stored online. **Know** how to send information over the internet in different ways.	**Describe** some of the ways that search results can be influenced. **Recognise** why the order of results is important and to whom. **Explain** how search engines make money. **Recognise** some limitations of search engines.
	Understand and **demonstrate** how to edit text using a keyboard including opening a file, deleting letters and using the arrow keys as a cursor.	**Explain** how to use information technology safely and talk about different rules for using IT.	**Explore** how digital devices can be connected. **Explain** the role of a switch, server and wireless access point in a network.	**Recognise** how the content of the WWW is created by people. **Understand** that there are rules to protect content and suggest who owns such content.	**Understand** and **compare** the difference between working online with working offline. **Contribute** to a shared project online.	**Recognise** how we communicate using technology. **Choose** methods of communications to suit particular purposes.
	Identify rules to keep us safe and healthy when technology is used in and beyond the home and **create** rules for using technology responsibly.	**Recognise** that choices are made when using information technology and use be able to use and **identify** IT for different types of activities.	**Recognise** the physical components of a network and talk about their benefits. **Identify** a range of networked devices.	**Evaluate** the consequences of unreliable content. **Understand** the importance of thinking carefully before content is shared/reshared. **Know** that some online information may not be honest, accurate or legal.	**Evaluate** different ways of working together online and **recognise** that working together on the internet can be public or private.	**Evaluate** different methods of online communication. **Know** when something should be shared / not shared. **Explain** that communication on the internet may be private.

Creating Media

	Digital Painting	Digital Photography	Animation	Audio Editing	Video Editing	Web Page Creation
	NC Reference: 1.4	NC reference: 1.4, 1.5, 1.6	NC reference: 2.6, 2.7	NC reference: 2.5, 2.6, 2.7	NC reference: 2.5, 2.6, 2.7	NC reference: 2.5, 2.6, 2.7
Foundation	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Begin to mark make on both paper and using a range of digital devices.	**Know** and **describe** what different freehand tools do through **exploration** - draw lines, make marks on a screen and draw a picture	**Use** a digital device to take a photograph and **explain** how to do it.	**Explain** that animation is a sequence of drawings or photographs and **demonstrate** this through the creation of a flip-book.	**Know** that sound can be digitally recorded. **Identify** the inputs and outputs required to play audio or record sound.	**Identify** and **compare** features in different videos. **Explain** what makes a video effective.	**Review** an existing website and consider its structure, including the different types of media used. **Know** that websites are written in HTML.
	Use the shape tool and the line tools with increasing effect, recreating the work of an artist	**Make** clear choices when taking a photograph, **making decisions** on whether it is better in landscape or portrait.	**Relate** animated movement with a sequence of images through the creation of a stop frame animation.	**Use** a digital device to record sound. **Suggest** how to improve the recording. **Demonstrate** how to play back recording.	**Identify** digital devices that can record video. **Experiment** with different camera angles. **Use** a microphone with increasing confidence.	**Know** the common features of a web page. **Plan** the features of a web page based on a given purpose. **Suggest** media to include on the page.
	Make careful choices when painting a digital picture including tools used and colours. **Know** that different paint tools do different jobs.	**Know** and **describe** what makes a good photograph and **improve** an existing photograph by retaking it.	**Plan** an animation using a storyboard and **describe** animations that are achievable on screen.	**Explain** that a digital recording is stored as a file. **Know** why it is useful to be able to save digital recordings and **demonstrate** how to do this. **Plan** and **write** the content for a podcast.	**Capture** video using a range of techniques. **Suggest** filming techniques for a given purpose. **Review** how effective the video is.	**Consider** the ownership and use of images (copyright). **Describe** what is meant by the term 'fair use'. **Find** copyright-free images.
	Explain tool choice when creating images	**Explain** how photographs can be improved through experimenting with different light sources.	**Identify** the need to work consistently and carefully. **Understand** and **demonstrate** 'onion skinning' to make small changes between frames.	**Explain** that audio can be changed through editing and **demonstrate** how to do this. **Know** how to pen a digital recording from a file.	**Create** a storyboard and decide which filming techniques will be used. Confidently **create** and save video content.	**Add** content to own web page. **Evaluate** what it looks like on different devices. **Recognise** the need to preview pages.
	Independently use a computer to paint a picture in the style of an artist and **evaluate** the outcome	**Effectively use** tools to **adapt** an image to achieve a desired effect.	**Review** and **improve** an animation based on feedback and **evaluate** the work of others.	**Show** that different types of audio can be combined and played together through choosing suitable sounds. **Use** editing tools to arrange sections of audio.	**Identify** that video can be improved through reshooting and editing. **Select** the correct tools to make edits. **Know** how to store, retrieve and export a recording to a computer.	**Know** what a navigation path is and **describe** why they are useful. **Create** multiple web pages and link them using hyperlinks.
	Understand and **compare** the differences between painting a picture on a computer and on paper	**Understand** and **recognise** that photos can be changed. **Know** when a photo has been changed.	**Evaluate** the impact of adding other media to an animation and **justify** choices made.	**Evaluate** editing choices made. Explain that digital recordings need to be exported to share them . **Suggest** improvements to a digital recording.	**Consider** the impact of the choices made when making and sharing a video. **Know** how to improve the final outcome. **Evaluate** and **share** opinion.	**Evaluate** the user experience of a website. **Recognise** the implications of linking to content owned by other people.

	Digital Writing	Making Music	Desktop Publishing	Photo Editing	Vector Drawing	3D Modelling
	NC Reference: 1.4, 1.6	NC reference: 1.4	NC reference: 2.5, 2.6	NC reference: 2.5, 2.6, 2.7	NC reference: 2.6	NC reference: 2.6, 2.7
Begin to use digital devices to type letters and numbers.	**Know** how to use a computer to write. **Identify** and **find** keys on a keyboard with increasing accuracy	**Explain** how music can make us feel and **identify** simple differences in pieces of music with increased concentration.	**Explain** the difference between text and images. **Recognise** how both convey information.	**Know** that digital images can be changed and **explain** the effect. **Identify** changes that can be made to an image.	**Identify** the main vector drawing tools. **Recognise** that vector drawings are made using shapes. **Know** that the drawing tools can be used to produce different outcomes.	**Use** a computer to create and manipulate three-dimensional (3D) digital objects. **Explain** why 3D objects may be represented on a computer.
	Know how to add and remove text on a computer by using backspace	**Identify** patterns in music. **Create** and **follow** a rhythm pattern using an instrument.	**Recognise** that text and layout can be edited for a given purpose (font style, size and colours).	**Change** the composition of an image and consider why this may be done. **Explain** what has changed in an edited image.	**Create** a vector drawing by combining shapes. **Explain** that each element added to a vector drawing is an object**. Know** how to move, resize and rotate duplicated objects.	**Compare** working digitally with 2D and 3D graphics. **Identify** how graphical objects can be modified.
	Know and **explain** how the look of text can be altered e.g. bold, italic, underline, capital letters.	**Know** that music is a sequence of notes. **Create** a musical pattern using three notes.	**Choose** appropriate page settings. **Create** a template, understand page orientation and recognise the importance of place holders.	**Choose** effects to make a image fit a scenario and **describe** how images can be changed for different uses.	**Use** tools to achieve a desired effect (alignment grids, resize handles and the zoom tool).	**Construct** a digital 3D model of a physical object. **Consider** the use of position, rotation and duplication.
	Through exploration, **explain** how to make careful choices when adapting the look of a text e.g. by changing the font. **Know** how to select all of the text by clicking and dragging and how to select a word by double-clicking.	**Demonstrate** and **refine** a musical pattern on a computer.	**Add** content to a desktop publishing publication and **make** necessary changes where appropriate.	**Make** good choices when selecting different tools. **Give** examples of positive and negative effects of retouching and **identify** how an image has been retouched.	**Recognise** that vector drawings consist of layers. **Know** how to change the order of layers and **identify** which objects are at the front or back layer of a drawing.	**Identify** that physical objects can be broken down into a collection of 3D shapes that are appropriately sized. **Know** how to group a digital 3D shape and a placeholder to create a hole in an object.
	Explain choices for the tools used when word processing and be able **discuss** overall effect created.	**Create** music for a purpose and **explain** choices made.	**Consider** how different layouts can suit different purposes.	**Combine** parts of images to create new images. **Recognise** that not all images are real.	**Demonstrate** how to group objects to make them easier to work with. **Know** how to reuse a group of objects to further develop a vector drawing.	Using knowledge gained, **design** a digital model by combining 3D objects.
	Identify comparisons and differences between typing on a computer to writing on paper and state preferences.	**Review** and **refine** computer work. **Explain** how it has been made better and **describe** the feelings it evokes.	**Consider** the benefits of desktop publishing and **identify** its uses in the real world.	**Evaluate** how changes can improve an image. **Consider** the effect of adding other elements to work.	**Evaluate** a completed vector drawing and **suggest** improvements. **Create** alternatives to vector drawings.	**Develop** and **evaluate** a digital 3D model against a given criterion. **Modify** and **improve** the model where appropriate.

Data and Information

	Grouping Data	Pictograms	Branching Databases	Data Logging	Flat-file Databases	Spreadsheets
	NC Reference: 1.4, 1.6	NC Reference: 1.4, 1.6	NC reference: 2.6	NC reference: 2.2, 2.6	NC reference: 2.5, 2.6	NC reference: 2.6
Foundation	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Begin to describe, group and compare a range of objects.	**Describe** objects using labels and **match** objects to groups.	**Recognise** that we can count and compare objects using tally charts. **Record** data in a tally chart and **represent** a tally count as a total.	**Create** questions with yes/no answers based on two groups of objects separated by one attribute.	**Choose** a data set to answer a given question. **Know** that data gathered over time can be used to answer questions. **Suggest** questions that can be answered using a given data set.	**Use** a form to record information. **Create** multiple questions about the same field. **Explain** how information can be recorded. **Order, sort** and **group** data cards.	Identify questions which can be answered using data. Explain the relevance of data headings.
	Identify that objects can be counted and grouped.	**Recognise** that objects can be represented as pictures. **Enter** data onto a computer and **use** it to view the data in a different format. **Use** pictograms to answer simple questions.	**Identify** the object attributes needed to collect relevant data.	**Explain** that sensors are input devices and that data from sensors can be recorded. **Use** a digital device to collect data automatically to answer a given question.	**Compare** paper and computer-based databases. **Navigate** a flat-file databse to compare different views of information.	**Apply** an appropriate number format to a cell. **Build** a data set in a spreadsheet application. **Explain** that objects can be described using data.
	Describe objects in different ways including properties.	**Know** what a pictogram shows. **Organise** data in a tally chart and **create** a pictogram from this.	**Create** a branching database and prove that it works. **Select** objects to arrange.	**Explain** that a data logger collects 'data points' from sensors over time and **identify** appropriate intervals to collect data. **Confidently talk** about the data captured.	**Explain** how grouping and then sorting data allows us to answer more specific questions.	**Explain** that formulas can be used to produce calculated data. **Construct** a formula in a spreadsheet. **Explain** the relevance of a cell's data type. **Identify** that changing inputs changes outputs.
	Count objects with the same properties and group objects in more than one way. Group similar objects.	**Select** objects by attribute. **Answer** questions, **arrange** objects and **make comparisons** using a common attribute.	**Explain** why it is helpful for a database to be well-structured. **Know** that questions need to be ordered carefully to split objects into equally sized groups.	**Know** how to import a data set. **Use** a computer program to sort data and to view it in different ways. **Use** data collected over a long duration to find information.	**Explain** that tools can be used to select specific data. **Know** and **choose** which field and value are required to answer a given question. **Demonstrate** how 'AND' and 'OR' can be used to refine data selection.	**Apply** formulas to data, including duplicating. **Recognise** that data can be calculated using different operations.
	Compare groups of objects and record how many objects are in each group.	**Recognise** that people can be described by attributes. **Use** this to **gather** data, c**reate** a pictogram and draw conclusions from it.	**Identify** objects using a branching database.	**Identify** the data needed to answer questions and **plan** how to collect it using a data logger.	**Explain** the benefits of using a computer to create graphs. **Refine** a chart by selecting a particular filter. **Explain** that computer programs can be used to compare data visually.	**Create** a spreadsheet to plan an event. **Apply** a formula to calculate the data needed to answer questions. **Explain** why the data should be organised.
	Answer questions about groups of objects and be able to record and share findings.	**Explain** that we can present information using a computer and know how to present it in different ways. **Give examples** of why some information should not be shared.	**Compare** the information shown in a pictogram with a branching database and **know** the purpose of each.	**Use** collected data to answer questions and draw conclusions. **Know** and **explain** the benefits of using a data logger.	**Apply** knowledge of a database to ask and answer real-world questions. **Present** findings to a group.	**Choose** suitable ways to present data (table and/or graph) to show the answer to questions.

Programming/Coding

	Moving a Robot	Robot Algorithms	Sequence in Music	Repetition in Shapes	Selection in Physical Computing	Variables in Games
	NC Reference: 1.1, 1.2, 1.3, 1.5	NC Reference: 1.1, 1.2, 1.3, 1.4	NC reference: 2.1, 2.2, 2.3, 2.6	NC reference: 2.1, 2.2, 2.3, 2.6	NC reference: 2.1, 2.2, 2.3, 2.6	NC reference: 2.1, 2.2, 2.3, 2.6
Foundation	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Begin to explore and experiment with moving a floor robot.	**Explain** the outcome of a command on a device. **Know** and practise how to run a command on a device.	**Follow** instructions given by someone else. **Give** clear and unambiguous instructions. **Describe** a series of instructions as a sequence.	**Explore** a new programming environment (Scratch). **Identify** the objects in this program and **recognise** that commands here are represented as blocks.	**Create** a code snippet for a given purpose. **Explain** the effect of changing the value of a command. **Program** a computer by typing commands. **Identify** that accuracy in programming is important.	**Control** a simple circuit connected to a microcontroller (to make an LED switch on). **Explain** the effect of an infinite loop.	**Define** a 'variable' as something that is changeable and **identify** examples. **Know** that variables can hold numbers or letters.
	Follow instructions, give directions and **recall** words that can be acted out.	**Explain** what happens when we change the order of instructions. **Use** an algorithm to program a sequence on a floor robot.	**Identify** that commands have an outcome. **Create** a program following a design and **know** that each sprite is controlled by the commands chosen.	**Create** a program in a text-based language. **Write** and **test** an algorithm to produce a given outcome.	**Write** a program that includes count-controlled loops. **Connect** more than one output component to a microcontroller. **Demonstrate** how to use a count-controlled loop to control outputs.	**Explain** why a variable is used in a program. **Know** that a variable has a name and a value. **Identify** a program variable as a placeholder in memory for a single value. **Know** that the value of a variable can be changed.
	Predict the outcome of a sequence involving forwards and backwards commands. **Know** how to combine forwards and backwards commands to make a sequence, starting the sequence from the same place.	**Follow** a sequence and **use** logical reasoning to predict the outcome of a program (series of commands).	**Explain** that a program has a start and **know** how to start a program in different ways.	**Explain** what 'repeat' means. **Identify** patterns in a sequence. **Use** a count-controlled loop to produce a given outcome.	**Know** how to design a conditional loop. **Program** a microcontroller to respond to an input. **Explain** that a loop can stop when a condition is met	**Choose** how to improve a game by using variables. **Recognise** how the value of a variable can be used by a program.
	Experiment with turn and move commands to move a robot. **Combine** four direction commands to make sequences, **predicting** the outcome.	**Know** that programming projects can have code and artwork. **Explain** choices made, **identify** the different routes available and **test** ideas.	**Recognise** and **explain** that a sequence of commands can have an order.	**Modify** a count-controlled loop to produce a given outcome. **Identify** the effect of changing the number of times a task is repeated. **Predict** the outcome of a program containing a count-controlled loop.	**Explain** that a loop can be used to repeatedly check whether a condition has been met. **Demonstrate** how to use selection (an 'if…then…' statement) to direct the flow of a program.	**Design** a project that builds on a given example. **Choose** artwork and create algorithms. **Explain** design choices.
	Plan, **create** and **debug** a simple program through the careful choice of the order of commands. **Explain** outcomes.	**Design** and **create** an algorithm and **explain** what the algorithm should achieve.	**Understand** how to change the appearance of a project and **make** informed choices.	**Use** a procedure in a program. **Decompose** a task into small steps.	**Design** a physical project that includes selection. **Create** a detailed drawing of the project, **describe** what it will do and **identify** a real-world example of a condition starting an action.	**Use** the design to **create** a project. **Test** the code and **choose** an appropriate name that identifies the role of the variable.
	Find more than one solution to a problem. **Demonstrate** how to use two different programmes to get to the same place.	**Plan** algorithms for different parts of a task. **Test** ideas and use this to **create** and **debug** own program.	**Create** project from a task description. **Identify** and **name** the objects needed an implement an algorithm as a code.	**Design** and **create** a program that uses count-controlled loops to produce a given outcome. **Develop** the program by debugging it.	**Create** a program that controls a physical computing project to produce an intended outcome. **Test** and **debug** the project. **Write** an algorithm that describes what the model will do.	**Evaluate** the project. **Extend** the game further using more variables. **Identify** ways that the game could be improved. **Share** the game with others.
	An Introduction to Animation	**An Introduction to Quizzes**	**Events and Actions**	**Repetition in Games**	**Selection in Quizzes**	**Sensing**
	NC Reference: 1.1, 1.2, 1.3, 1.4	NC Reference: 1.1, 1.2, 1.3	NC reference: 2.1, 2.2, 2.3, 2.6	NC reference: 2.1, 2.2, 2.3	NC reference: 2.1, 2.2, 2.3, 2.6	NC reference: 2.1, 2.2, 2.3, 2.6
Begin to explore and experiment with moving a floor robot.	**Know** how to choose a command for a given purpose e.g. moving a sprite.	**Explain** that a sequence of commands has a start. **Demonstrate** how to run a program.	**Explain** how a sprite moves in an existing program. **Identify** ways to improve the program.	**Develop** the use of count-controlled loops in a different programming environment. **Modify** a snippet of code to create a given outcome and **predict** the result.	**Identify** conditions in a program. **Modify** a condition in a program. **Explain** how selection is used in computer programs.	**Apply** knowledge of programming. **Test** and **create** a program to run on a controllable device.
	Demonstrate how a series of commands can be joined together using blocks.	**Explain** and **demonstrate** that a sequence of commands has an outcome. **Predict** the outcome of a sequence.	**Create** a program to move a sprite in four directions.	**Explain** that in programming there are infinite loops and count controlled loops. Know when to use each type. **Modify** a loop to produce an intended outcome. **Recognise** that some programming languages enable more than one process to be run at once.	**Create** a program with different outcomes using selection. **Know** that a conditional statement connects a condition to an outcome. **Use** selection in an infinite loop to check a condition.	**Explain** that selection can control the flow of a program. **Use** a variable in an 'if', 'then', 'else' statement to select the flow.
	Identify and **explain** the effect of changing a value.	**Create** a program using a given design. **Build** the sequences of blocks needed for it and **establish** the actions of a sprite in an algorithm.	**Adapt** a program to a new context and **consider** the real world when making design choices. **Know** how to use a programming extension.	**Develop** a design that includes two or more loops which run at the same time. **Evaluate** and **explain** the effectiveness of this.	**Explain** how selection directs the flow of a program. **Know** that program flow can branch according to a condition.	**Experiment** with different physical inputs. **Know** that if you read a variable the value remains. **Demonstrate** how to update a variable with a user input.
	Understand that each sprite has its own instructions. **Explain** how to add blocks to a sprite, delete a sprite and understand that that a project can have more than one sprite.	**Change** a given design through **choosing** different backgrounds and characters.	**Develop** a program by adding features.	**Modify** an infinite loop in a given program by re-using existing code snippets on new sprites.	**Design** a program which uses selection and **identify** the outcome.	**Explain** the importance of the order of conditions in 'else', 'if' statements. **Use** an conditional statement to compare a variable to a value. **Modify** a program to achieve a different outcome.
	Begin to **design** a project. **Choose** appropriate artwork, **create** algorithms and **make decisions** on how each sprite will move.	**Create** a program based on own design (**build** sequences of blocks, **choose** appropriate images and **create** an algorithm).	**Understand** how to modify and test a program to identify and fix bugs.	**Design** a project that includes repetition. **Explain** what the project will do and **evaluate** the use of repetition.	**Create** a program which uses selection. **Test** the program and **share** it with others.	**Design** a project that uses inputs and outputs on a controllable device. **Decide** on the variables to include. **Design** the algorithm and the program flow.
	Use an algorithm to create a program by adding blocks. **Know** how to test the program. **Use** sprites that match the design.	**Decide** how a project can be improved. **Compare** the outcome to the design. **Debug** the program where appropriate.	**Design** and **create** a maze based challenge. **Making choices** and **evaluating** outcomes.	**Create** a project that includes repetition. **Evaluate** the steps followed when building the project. **Refine** the algorithm in the design where appropriate.	**Extend, evaluate** and **improve** the program. **Identify** the setup code needed to run the program.	**Create** a program to use inputs and outputs on a controllable device based on the design. **Test** the program and **use** a range of approaches to find and fix bugs.