Computing: NC/Progression of Skills

National Curriculum Statements

Subject content
Key stage 1
Pupils should be taught to:
a. understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions
b. create and debug simple programs
c. use logical reasoning to predict the behaviour of simple programs
d. use technology purposefully to create, organise, store, manipulate and retrieve digital content
e. recognise common uses of information technology beyond school
f. 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.

Key stage 2
Pupils should be taught to:
g. design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
h. use sequence, selection, and repetition in programs; work with variables and various forms of input and output
i. use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
j. 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
k. use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
l. 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
m. use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

Progression of Skills

Added from the GAT basic skills policy

	Multimedia					
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Text and Multimedia	Work with others and with support to contribute to a digital class resource which includes text, graphic and sound Logging in and out of a computer Opening document Typing simple sentences with capital letter and full stop	Generate their own work, (with help where appropriate with multimedia) combining text, graphics and sound. Begin to choose own name for a document	Record and present information integrating a range of appropriate media combining text and graphics in printable form and sound and video for on-screen presentations	Record and present information integrating a range of appropriate media combining text and graphics in printable form and sound and video for on-screen presentations which include hyperlinks.	Use advanced tools in word processing / DTP software such as tabs, appropriate text formatting, line spacing etc appropriately to create quality presentations appropriate for a known audience.	Multimedia works shows restrained use of effects that help to convey meaning rather than impress.
	In Word: Finding keys on a keyboard – space bar/caps lock/full stop Alternating between upper and lower case Changing size and colour of the font	Save and retrieve and edit their work. In Word: Word Use of return key, backspace, delete Insert word art Spell check Change the font Copy and paste		Begin to show an awareness of the intended audience and seek feed-back.		
Digital Images (photos, paint, animation)	Use a range of simple tools in a paint package / image manipulation software to create / modify a picture.	Use a range of tools in a paint package / image manipulation software to create / modify a picture to communicate an idea.	Manipulate digital images using a range of tools in appropriate software	Manipulate digital images using a range of tools in appropriate software to convey a specific mood or idea.		
	Digital Images (photos, paint, animation) Inserting image from given shared folder into word document (teacher choice) PowerPoint: Insert text Insert given pictures Change the background colour Insert new slide	Create a simple animation to tell a story. Insert into word online picture using search facility PowerPoint: Edit a given template – adding pictures and text Edit the title Begin to explore slide transitions			Make a short film / animation from images (still and / or moving) that they have sourced, captured or created.	Use images that they have sourced / captured / manipulated as part of a bigger project (eg presentation or document).
Sound and music (including sound recorders)	Chose suitable sounds from a bank to express their ideas.	Compose music from icons.	Create a simple podcast, selecting and importing already existing music and sound effects as well as recording their own.	Create multiple track compositions that contain a variety of sounds	Create and share more narrations and composed pieces and consider the effect that this will have on the audience.	
	Record short speech.	Produce a simple presentation incorporating sounds the children have captured, or created.				

Technology in our lives

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Electronic communication	Contribute ideas to a class Team/ OneNote Knowing what an email is Opening email app Opening a link from an email	Work collaboratively by email/Teams to share and request information of another class or story character. Understanding what an email is and when to use them Whole class shared writing of an email – subject box etc.	Share ICT work they have done electronically by email, Teams, or uploading to authorised sites.	Share ICT work they have done electronically by email, Teams, or uploading to authorised sites.		
	Begin to understand the need to abide by school e-safety rules.	Begin to understand the need to abide by school e-safety rules.	Begin to understand the need to abide by school e-safety rules.	Understand the need to abide by school e-safety rules.	Abide by school rules for e-safety.	Abide by school rules for e-safety.
Research and E-Safety	As a class exercise children explore information from a variety of sources (electronic, paper based, observations of the world around them, etc.). They show an awareness of different forms of information Use a search engine for a purpose Knowing the safe site - padlock	Children use a search engine to find specific relevant information to use in a presentation for a topic.	Using another curriculum area as a starting point, children ask their own questions then use ICT sources to find answers, making use of search engines, an index, menu, hyperlinks as appropriate. Children use the information or resources they have found.	Confidently use a search engine to find information Make use of copy and paste, beginning to understand the purpose of copyright regulations They show an understanding that not all information on the internet is accurate.	Be able to search for specific information online and refine searches beginning to understand the purpose of copyright regulations and the need to repurpose information for a particular audience Use appropriate methods to validate information and check for accuracy.	B Repurpose and make appropriate use of selected resources for a given audiences, acknowledging material used where appropriate. Use appropriate methods to validate information and check for bias and accuracy.
Understanding Technologies (Individual Technologies)	Show an awareness of the range of devices and tools they encounter in everyday life	Show an awareness of a range of inputs to a computer (IWB, mouse touch screen, microphone, keyboard, etc)	Begin to show discernment in their use of computing devices and tools for a particular purpose	Begin to show discernment in their use of computing devices and tools for a particular purpose and explain why their choice was made.	Evaluate the tools available to them including any that are unfamiliar or new and use them to solve problems.	Evaluate the tools available to them including any that are unfamiliar or new and use them to solve problems. Demonstrate an awareness of the appropriateness of outcomes depending on choices regarding tools and devices.
			Children talk about using ICT to find information / resources noting any frustrations and showing an emerging understanding of internet safety.	Children talk about using ICT to find information / resources noting any frustrations and showing an increasing understanding of internet safety.	Develop a growing awareness of how to stay safe when using the internet (in school and at home) and that they abide by the school's internet safety policy.	Independently and with due regard for safety, search the internet using a variety of techniques to find a range of information and resources on a specific topic.

Handling Data

(links to be made with other curriculum subjects, maths, science, geography)

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Handling Information (databases and graphs)	As a class or individually with support, children use a simple pictogram or painting program to develop simple graphical awareness / one to one correspondence.	Use a graphing package to collect, organise and classify data, selecting appropriate tools to create a graph and answer questions.	They follow straight forward lines of enquiry to search their data for their own purposes.	They follow straight forward lines of enquiry to search their data for their own purposes.	Independently solve a problem by planning and carrying out data collection, by organising and analysing data involving complex searches using a database, and by drawing conclusions and presenting findings	Independently solve a problem by planning and carrying out data collection, by organising and analysing data involving complex searches using a database, and by drawing conclusions and presenting findings.
	Use technology to collect information, sort it and present it to others	Enter information into a simple branching database, database or word processor and use it to answer questions.	Children use a simple database (the structure of which has been set up for them) to enter and save information on a given subject.	Children use a simple database (the structure of which has been set up for them) to enter and save information on a given subject.	Children use a simple database (the structure of which has been set up for them) to enter and save information on a given subject.	
		Tell an adult what kind of information they could use to help investigate a question.	They talk about their experiences of using ICT to process data compared with other methods.	They talk about their experiences of using ICT to process data compared with other methods.	Children should be able to talk about issues relating to data protection and the need for data security in the world at large (eg health, police databases).	Children should be able to talk about issues relating to data protection and the need for data security in the world at large (eg health, police databases).
Spreadsheets	In Excel: Know the symbol Put numbers in a cell Enter a simple chart (linked with tally chart) Save the document	In Excel: Open a saved file Create a tally chart with a title	Make simple use of a spreadsheet to store data and produce graphs.	Make simple use of a spreadsheet to store data and produce graphs.	Make simple use of a spreadsheet to store data and produce graphs. Begin to use simple formulas such as SUM and reference other cells.	Set up and use their own spreadsheet, which contains formulae to investigate mathematical models. Ask "what if ..." questions and change variable in their model. Understand the need for accuracy when creating formulae and check regularly for mistakes, by questioning results. Relate their use of spreadsheets to model situations to the wider world.
Data logging (science and maths)		Talk about different ways to use technology to collect information	Begin to use a data logger to sense physical data (sound, light, temperature).	Begin to use a data logger to sense physical data (sound, light, temperature).	Children are able to identify their own opportunities for data logging and carry out their own experiments. They check and question results and are able to spot trends in data and identify when problems may have occurred.	Children are able to identify their own opportunities for data logging and carry out their own experiments. They check and question results and are able to spot trends in data and identify when problems may have occurred. The need for accuracy is demonstrated and strategies for spotting implausible data are evident.

Programming- Computer science

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Control (algorithms)	Give instructions to others and follow their instructions around Control simple everyday devices to make them produce different outcomes.	Give instructions to others (using forwards, backwards ad turn) and physically follow their instructions around Control a device, on and off screen, making predictions about the effect their programming will have.	Children are able to type a short sequence of instructions and to plan ahead when programming devices on and off screen.	Children are able to type a short sequence of instructions where they predict, test and refine their programming.	Use control software to control devices (using output commands) or to simulate this on screen. Predict, test and refine their programming.	Independently create sequences of commands to control devices in response to sensing (i.e. use inputs as well as outputs). Use different inputs (sensors) to control a device or onscreen action and predict what will happen
		Children can plan ahead and make predictions		Engage in block coding based problem solving activities that require children to write procedures etc. and to predict and test	Engage in block coding based problem solving activities that require children to write procedures etc. and to predict, test and modify Use a variable to increase programing possibilities	Design, build, test, evaluate and modify the system; ensuring that it is fit for purpose. Use a variable and operators to stop a program

Programming- Computational Thinking

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Computational thinking	Describe what actions they will need to do to make something happen and use the word 'algorithm' Begin to predict what will happen for a short sequence of instructions Make simple choices to control a simple simulation program.	Tell adults the order theu need to do things to make something happen and talk about this as an algorithm. Look at other's programs and tell them what will happen. Children are able to play an adventure game and use a simple simulation, making choices and observing the results.	Break an open-ended program into smaller parts Describe the algorithm they will need for a simple task Use models and simulations to find things out	Break up an open ended problem up into smaller parts Recognise that an algorithm will help them sequence more complex problems Use an efficient procedure to simplify a program Use models and simulations to find things out and solve problems.	Decompose a problem into smaller parts to design an algorithm for a specific outcome and use this to write a program Use if and then commands Understand the need for accuracy when creating formulae and check regularly for mistakes, by questioning results.	Decompose a problem into smaller steps, recognizing similarities to solutions used before Explain and program each of the steps in their algorithm Understand the need for accuracy when creating formulae and check regularly for mistakes, by questioning results. Relate their use of spreadsheets to model situations to the wider world.
Modelling and simulations (spreadsheets, adventure games and simulations)		Their conversation shows they understand that computers are good at replicating real life events and allowing them to explore contexts that are otherwise not possible.	Recognisethat simulations are usefulin widening experience beyond the classroom.	Recognisethat simulations are usefulin widening experience beyond the classroom.		
Evaluation	Use the word 'debug' when they correct mistakes when they program	Watch a program execute and spot where it goes wrong so they can debug it.	Detect a problem in an algorithm which could result in a mistake occurring Keep testing their programs and can recognise when they need to debug it	Recognise an error in a program and debug it Know that they need to keep testing their programs while they are putting it together.	Use logical reasoning to detect and debug mistakes in a program	Evaluate the effectiveness and efficiency of their algorithm while they continually test the programming of that algorithm Use logical reasoning to detect and correct errors in algorithms.

Online safety and online sense

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Understanding Technologies (networks)	Show an awareness that what they create on a computer or tablet device can be shown to others via another device(e.g.printer, projector,AppleTV) Keep a password private Printing when appropriate	Begin to show an awareness that computers can be linked to share resources Awareness of what is appropriate to print- begin to make this decision Begin to access the shared class group to open documents	Show an understanding that their password is the key to accessing a personalisedsetof resourcesandfiles (e.g. OneDrive).	Showanawarenessofwhere passwords arecriticalineverydayuse (e.g.parents accessing bankdetails)	Showanunderstandingofhow filtering andmonitoringtools affect their useof the school network and Internet and compare this with their experience of access outside school.	Showanunderstandingofhow filtering andmonitoringtools affecttheir useof the school network and Internet and compare this with their experience of access outside school.
Understanding Technologies (the internet)	Explain what personal information is Know when to tell an adult when they see something unexpected or worrying online Able to talk about why it is important to be kind and polite Recognise an age appropriate website Agree and follow sensible safety rules	Use websites and demonstrate an awareness of how to manage their journey around them (e.g. using the back/forward button, hyperlinks) Explain why we need to keep my password and personal information private. Describe the things that happen online that they must tell an adult about. Talk about why they should go online for a short amount of time. Talk about why it is important to be kind and polite online and in real life. Know that not everyone is who they say they are on the internet	Show an awareness that not all the resources/toolstheyuseareresident on the device they are using. Begintoshowanunderstandingof URLs. Talk about what makes a secure password and why they are important. Protect personal information when they do different things online. Use the safety features of websites as well as reporting concerns to an adult. Recognise websites and games appropriate for my age. Make good choices about how long they spend online. Ask an adult before downloading files and games from the internet. Post positive comments online.	Show an awareness that not all the resources/toolstheyuseare residenton the device they are using. Begintoshowanunderstandingof URLs. Choose a secure password when they are using a website. Talk about the ways they can protect themselves and others fro m harm online. Use the safety features of websites as well as reporting concerns to an adult. Know that anything they post online can be seen by others. Choose websites and games that are appropriate for their age. Help their friends make good choices about the time they spend online. Talk about why they need to ask a trusted adult before downloading files and games from the internet. Comment positively and respectfully online.	Use collaborative tools and e-mail showing a sensitivity for this type of remote collaboration and communication Protect their password and other personal information. Explain why they need to protect themselves and their friend s and the best ways to do this, including reporting concerns to an adult. Know that anything they post online can be seen, used and may affect others. Talk about the dangers of spending too long online or playing a game. Explain the importance of communicating kindly and respectfully. Discuss the importance of choosing an age- appropriate website or game. Explain why they need to protect their computer or device from harm. Know which resources on the internet they can download and use	Use collaborative tools and e-mail showing a sensitivity for this type of remote collaboration and communication Protect their password and other personal information. Explain the consequences of sharing too much information about themselves online. Support their friends to protect themselves and make good choices online, including reporting concerns to an adult. Explain the consequences of spending too much time online or on a game. Explain the consequences to themselves and others of not communicating kindly and respectfully. Protect their computer or device from harm on the internet.