Progression Grid for Computing

The national curriculum for Computing aims to ensure that all pupils:

1) can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation. (Computer Science - pupils are taught how digital systems work, how they are designed and programmed, and the fundamental principles of information and computation.)

2) can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems. (Computer Science - pupils are taught how digital systems work, how they are designed and programmed, and the fundamental principles of information and computation.)

3) can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems. (Information Technology - computing equips pupils to apply information technology to create products and solutions.)

4) are responsible, competent, confident and creative users of information and communication technology. (Digital Literacy - computing provides an opportunity for pupils to use, and express themselves through, information and communication technology – at a level suitable for the future workplace and as active participants in a

Breadth of Study

Foundation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6

National Curriculum Programme of Study

Foundation	Year 1 / Year 2	Year 3–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.	**Computer Science:** Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. Create and debug simple programs. Use logical reasoning to predict the behaviour of simple programs	**Computer Science:** 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
	Information Technology: Use technology purposefully to create, organise, store, manipulate and review digital content	**Information Technology:** 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
	Digital Literacy: Recognise common uses of 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	**Digital Literacy:** Understand the opportunities (networks) offer for communication and collaboration. Be discerning evaluating digital content. Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

Digital Literacy - Online Safety

Foundation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Recognise the internet can be used to communicate with others in a variety of ways	Identify rules to keep safe and healthy when using technology in and beyond the home	Identify rules to keep safe and healthy when using technology in and beyond the home and suggest devices connected to the internet in their homes	Explain identity and how they can represent themselves in different ways online such as using an avatar	Explain how their online identity can be different to real life and describe the right decisions how they interact with others online	Explain how identity on line can be copied, modified or altered and demonstrate responsible choices for their online identity	Identify messages online about gender roles from the media and others and explain why it is important to reject inappropriate messages about gender online
Identify ways information can be put on the internet	Give examples of rules to keep safe and healthy when using technology in and beyond the home	Recognise how to use technology responsibly	Describe how people can get together online and explain some risks of communicating with others online which is different from knowing someone in real life	Describe strategies to be safe and have fun when using online social environments; giving examples of how to be respectful to others online	Explain how they can collaborate positively with others online but that there are some people online who ay want to do harm to them or their friends and this is not their fault.	Describe issues online that might make them or others feel sad, worried, uncomfortable or frightened and give examples of online and offline help
Identify rules that help keep them safe and healthy in and beyond the home when using technology Use the internet with adult support and know what not to share with others online.	Discuss what are the benefits from the rules to keep safe and healthy when using technology in and beyond the home	Describe how those rules help them stay safe	Know who to ask if unsure about uploading content about themselves or others and can search for themselves online	Describe how others can find information about them online and explain ways that some information could be created, copied or shared by others	Search for information about others online and describe ways that information can be used to make judgements about others	Explain how impulsive and rash communications online may cause problems and show understanding for the need to be responsible for the well being of others
Describe how some people can be unkind and what makes someone a good friend	Recognise that there may be people who could make them feel sad or upset and give examples of when and how to speak to an adult they trust	Give examples of issues online that might make them feel sad, worried, unmcomfortable or frightened and can give examples of how they might get help	Know what cyberbullying is and can describe rules about how to behave online	Identify some online media technologies such as image, video, text and chat where bullying might take place and the need to consider others feelings	Recognise when someone is upset, hurt or angry online and describe ways for someone being bullied online to get help	Explain how they are developing an online reputation influencing others opinions of them and how to build a positive online reputation
Identify how devices connnected to the internet can be used to find things out and give examples eg. voice activated Smart Speakers	Use the intenet with adult support to communicate with others they know and explain why it is important to be kind and considerate to others	Give examples of how they can use technology to comunicate with others	Use key phrases in search engines with awareness of belief, fact and opinion as well as explain how the internet is used to buy and sell things	Search for information within different technologies (social media, images, videos) and differentiate between opinions beliefs and facts and what makes something a fact.	Explain how to block abusive users and report online bullying on the apps and platforms they use including to helpline services such as Childline	Describe how to evidence cyber bullying such as capturing content with screen grabs, recording URL's to enable them to report concerns in school and at home
Know that information can be private or public and they can identify examples of personal information e.g. name, age	Ask a trusted adult about what should be put online as they recognise that information ca stay online and be copied	Explain how information put online about them or by them can last a long time and be seen by others	Explain why too much time using technology can have a negative impact such as spending time engaged with games and videos	Describe some methods the internet uses to encourage people to buy things such as pop ups, in app puchases, offers and that some people on line may be computer programmes pretending to be real people	Use different search technologies and evaluate digital content from search results with an understanding for data, information, fact, opinion, belief, true, false, valid, reliable and evidence.	Use search engines effectively and explain how search engines work as well as being discerning in evaluating digital content
		Give examples of how bullying onlne might look; how someone might feel and where someone can get help	Explain why they should only share information with people they know and trust and if unsure to ask a trusted adult.	Explain how using technology can distract them from other activities and identify ways to limit the amount of time using technology	Understand the difference between online mis-information and dis-information and explain what is meant by being sceptical	Describe how online information can be opinion and explain how and why some people present information as facts
Use the internet to find a picture	Use the internet to find things out	Use keywords in search engines and explain why some information online may not be true	Understand why passwords are important and should be kept private	Desribe strategies for keeping personal information private and explain what a strong password is	Explain what is meant by a hoax and why some online information may not be honest, accurate or legal	Define terms influence, manipulation and persuasion and how they might encounter these on line e.g advertising
Recognise inappropriate content and know to tell an appropriate trusted adult	Recognise personal information and explain why they should ask a trusted adult before putting information online	Describe and explain rules for keeping information private such as paswords	Explain why they should not copy someone else's work from the intenet wihout permission	Explain that others online can pretend to be them or their friends	Describe ways technology can affect healthy sleep and describe some of the issues	Model ideas using prototypes and pattern pieces.

Foundation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Know that the work they create belongs to them	Recognise that conent online may belong to other people		Explain the need to consider who owns content on the internet and whether they have the right to use it	Help stay safe by creating and using strong passwords	Know systems to regulate age related content such as PEGI ratings and use strategies to promote healthy, self regulated use of technology e.g. night shift mode, regular breaks, correct posture, sleep diet and exercise.
They can name their work so others know it belongs to them	Name their work so others know it belongs to them				Eplain why they should seek permission from a trusted adult before making payment for additional content such as in-app purchasing	Use different passwords for online services, manage those passwords and know what to do if the password is lost or stolen

Foundation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
					Explain that many free apps and services may access and share their private information e.g. contacts, lies, images, videos, messages and geolocation with others	Explain what app permissions are, use privacy settings and identify illegal strategies such as scams and phishing.
					Assess and justify when it is acceptable to use the work of others	Use search tools to access online content that can be used be others and demonstrate how to reference content from others used from the internet

Computer Science and Coding

Foundation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Explore technology	Know that people interact with computers		Design solutions (algorithms) that use repitition and two way selection i.e. if, then and else	Show awareness of tasks best completed by humans or computers	Know that iteration is the repitition of a process such as a loop	Create programs that implement algorithms to achieve given goals
Repeat an action with technology to trigger a specific outcome	Understand that computers need precise instructions	Understand that algorithms are implemented on digital devices as programs	Create programs that implement algorithms to achieve given goals	Know the difference between if, if then and else statemets	Know that programming bridges the gap between algoritmic solutions and computers	Able to declare and assign variables
Follow simple instructions to control a digital device	Understand that programs run by following precise instructions	Begins to use arithmetic operators, if statements and loops within programs	Use diagrams to express solutions	Appropriately use if, if then and else statements	Know that different algorithms exist for the same problem	Able to use post tested loops e.g. until, and a sequence of selection statements in programs, including if, then, else
Input a short sequence of instructions to control a device	Can run check and change programs	Can use logical reasoning to predict outcomes and the behaviour of programs	Declare and assign variables	Design solutions by decomposing a problem and create a sub-solution for each of these parts (decomposition)	Has practical experience of a high level textual language, including using standard libraries when programming	Knows the difference between and appropriately uses if, then and else statements
Can order the steps of a known task	Understand what an algorithm is and is able to represent algorithms using symbols	Begins to use simple algorithms using loops, (repeats), and selection (if statements) e.g. 'Start on Tap' yellow block in Scratch Jnr	Use logical reasoning to predict outputs, showing awareness of inputs	Design, write and debug modular programs using procedures	Represent solutions using a structural notation	Use a variable and relational operators within a loop to govern termination
Recognise the success or failure of an action	Begins to develop care and precision to avoid errors with algorithms	Find and correct simple errors ie debugging, in algorithms	Use post tested loops e.g. 'until', and a sequence of selection statements in programs including an if, then and else statement	Know that different solutions exist for the same problem	Use a range of operators and expressions e.g. Boolean, and applies them in the context of program control	Designs writes and debugs modular programs using procedures
Try alternative approaches to achieve a goal		Find and correct simple errors ie debugging, in programs	Know that users can write their own programs	Know that procedure can be used to hide the detail with sub-solution (procedural abstraction)	Identify similarities and differences in situations and can use these to solve problems (pattern recognition)	Designs solutions by decomposing a problem and creates a sub-solution for each of these parts (decomposition)
			Use a range of input and output devices	Know that computers collect data from variousinput devices, including sensors and application software	Select the appropriate data types	Knows that a procedure can be used to hide the detail with sub-solution (procedure abstraction)
Understand that we control computers	Know that computers have no intelligence and that computers can do nothing unless a program is run	Know that computers have no intelligence and that computers can do nothing unless a program is run	Know that a range of digital devices can be considered a computer	Able to declare and assign variables	Design solutions (algorithms) that use repetition and two way selection i.e. if, then, else	Able to use criteria to evaluate the quality of solutions and can identify improvements making some refinements to the solution and future solutions
Recognise patterns in groups of objects	Know that all software executed on digital devices is programmed	Know how programs specify the function of a general purpose computer			Know that all software executed on digital devices is programmed	Able to design a computing system that uses sensors
	Know that digital content can be represented in many forms				Know that programs can work with different types of data e.g. text, number	Combine a variable with relational operators (<=>) to determine when a program changes e.g. if score >5, say "well done"
	Knows that users can develop their own programs and demonstrate this using programmable robots				Be able to use post tested loops e.g. until, and a sequence of selection statements in programs, including if, then, else	Predict what will happen in a program or algoritm (e.g. change of output) when the input changes (e.g. sensor, data or event)
					Create programs that implement algorithms to achieve given goals	

Information Technology - Computer Systems and Networks (Technology Around Us)

Foundation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Recognise and use different digital devices	Name a range of digital devices in the classroom	Identify examples of computers and describe some uses of computers	Explain that digital devices accept inputs and produce outputs	Describe the internet as a network of networks and demonstrate how information is shared across the internet	Describe that a computer system features inputs, processes, and outputs and explain that computer systems communicate with other devices	Use a search engine - complete a web search to find specific information, refine the search and compare results from different search engines
Understand that you can access content on a digital device	Understand that you can share digital content	Explain the purpose of information technology in the home	Identify input and output devices	Explain how the internet allows us to view the World Wide Web;	Identify tasks that are managed by computer systems	Describe how search engines select results and recognise the role of web crawlers in creating an index
Recognise the basic parts of a computer, e.g. mouse, screen, keyboard	Explain what the basic parts of a computer are used for, e.g. mouse, screen, keyboard	Identify information technology beyond school giving examples	Recognise and explain how digital devices can be used for different activities	Outline how websites can be shared via the World Wide Web and where they are stored	Recognise that data is transferred over the internet and that networked digital devices have unique addresses	Explain some of the criteria that a search engine checks to decide on the order of results
Recognise key parts of a keyboard, e.g. spacebar, numbers, letters	Recognise and use a range of output devices e.g. printer, speakers, monitor, screen	Explain how information technology benefits us - demonstrate how information technology is used in a shop and explain how information technology helps people	Suggest differences between using digital devices and non-digital tools	Describe how content can be added and accessed on the World Wide Web	Recognise that connected digital devices can allow us to access shared files stored online and that the internet allows different media to be shared	Explain the different ways in which people communicate using technology

Foundation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Use a simple password when logging on, where relevant	Use a simple password when logging on, where relevant	List different uses of information technolog recognising how to use information technology responsibly	Explain how a computer network can be used to share information using multiplr connections	Explain how websites and their content are created by people	What are the benefits of working together in a shared project online	Compare different methods of communicating on the internet and decide when you should and should not share information
Add text to a document using the keyboard (where appropriate)	Recognise and use a range of input devices e.g mouse, keyboard, microphone, touchscreen	Identify the choices that are made when using information technology	Explore how digital devices can be connected and explain the role of a switch, server, and wireless access point in a network	Explain why everything on the World Wide Web is not true and why you need to think carefully before sharing or resharing content	Identify different ways of working together online and explain how the internet enables effective collaboration	
Use a mouse, touchsceen or appropriate access device to target and select options on screen						
Understand you can access the same content on different devices	Understand that you can find information on a website		Identify the physical components of a network and describe the benefits of a network			
	Understand that you can use a search engine to find information using keyword searches					
Understand that information and media can be stored on a digital device, e.g. they ask to view a photo that has been taken on a tablet	Know where to save and open work					
	Recognise that a range of devices contain computers e.g. washing machine, car, laptop					
	Understand that all devices, program, websites, apps and games are designed and manufactured by real people to fulfill specific tasks					

Information Technology - Digital Media (Text / Images / Multimedia)

Foundation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Use technology to explore digital content	Explore the keyboard to write and add text on a computer and remove text by using backspace	Know how to edit digital content to improve it	Know how to edit digital content to improve it with clear purpose	Know how to edit digital content to improve it with clear purpose with some consideration for the given audience	Identify and use appropriate hardware and software to fulfill a specific task	Identify and use appropriate hardware and software to fulfill a specific task
Operate a digital device with support to fulfill a task	Make changes to text and explain why you chose the tools you use	Apply edits to digital content to achieve a particular effect	Edit digital content to improve it according to feedback	Edit existing media to make new content with an awareness of copyright	Remix and edit a range of existing and their own media to create content	Remix and edit a range of existing and their own media to create content
Create simple digital content e.g. digital art	Compare writing on a computer and writing on paper and can say which you prefer	Identify what makes good or bad digital content, e.g. poor sound recordings, unfocussed images	Evaluate their own and existing digital content	Collaborate with peers using online tools e.g. blogs, Google Drive, Office 365	Understand the benefits of technology to collaborate with others	Understand the benefits of technology to collaborate with others
Choose a digital device from a selection to complete a specific task	Know how to create digital content using the tools within a simple art or writing package	Select media with support to present information on a topic e.g. images, video, sound	Select media independently to present information on a topic e.g. text, images, video, sound	Collect, organise and present information effectively using a range of media	Be aware of a range of Internet services to aid collaboration e.g. email, VOIP Voice Over Internet Protocol - Skype, Hangouts, FaceTime), World WIde Web, and what they do	Select, combine and use Internet services to fulfill a purpose
Choose media to convey information; e.g. image for a poster	Begin to select basic options to change the appearance of digital content	Plan out digital content e.g. use a storyboard to sequence an animation	Design and create digital content for a specific purpose	Use a range of tools to edit and enhance media for a particular effect	Recognise the audience when designing and creating digital content	Evaluate their own content against their own success criteria and make improvements accordingly
	Know how to capture media (digital images, video or audio) using digital devices					
	Combine media with support to present information e.g. text and images					
Know how to access and playback captured digital content	Know how to access and start to edit captured digital content					

Information Technology - Digital Data Handling

Foundation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Able to sort objects into 1 or more categories	Recognise that digital content can be represend in many forms e.g. charts, tables, or branching databases; and why we use them	Recognise different types of data e,g, text, number	Appreciate that different programs work with diferent types of data e.g. text, number	Aware of the difference between data and information	Understand the difference between data and information	Performs more complex searches for information e.g. usues Boolean and relational operators
Able to answer basic questions about information displayed in images e.g. more or less	Distinguish between different forms of data representation and can explain different ways that they can communicate information	Appreciate that programs can work with different types of data	Able to explore a record database to find out information	Use the sort feature in a flat file to refine searches for information	Know why sorting data in a flat file can improve searching for information	Analyses and evaluates data and information, and recognises that poor quality data leads to unreliable results, and inaccurate conclusions
Collect simple data on a topic e.g. likes/dislikes	Use specific software to create simple charts	Recognise that data can be structured in tables to make it useful	Understand the benefits of using a computer to create charts and databases	Begin to use filters in a database to find out information	Use filters in a database to find out specific information	Use filters in a database to find out specific information
Able to present simple data using images e.g. number of animals, shapes	Collect data on a topic (eye colour, pets, etc)	Present data in a pictogram independently	Understand that search engines store information in databases	Able to perform single criteria searches for information	Present data in different ways to convey information	Present data in an increasng number of ways to effectively convey information
	Create a branching database using pre-prepared images and questions	Independently plan out and create a branching database	Begin to present data in a number of ways to convey information	Design a questionairre with support and collect a range of data on a theme	Design a questionairre independently and collect a range of data on a theme	Design a questionairre independently and collect, present and analyse a range of data on a theme

		Enter data into a a database package and test	Draw conclusions from information stored in a database, table or chart	Analyse and interrogate data stored in a database, table or chart	Analyse and interrogate data stored in a database, table or chart
Identify an object using a branching database	Recognise an error in a branching database				
Identify an object by asking yes/no questions	Evaluate a given branching database and suggest improvements				
Explain information shown in a simple chart, pictogram or database	Understand that questions are important when collecting data				