



Bramcote Hills Primary School  
'Make the future better for all'



## Curriculum Depth Map - Computing

### Intent:

At BHPS we aim to prepare our children for a rapidly changing world through the use of technology. Our computing curriculum is designed to enable them to use computational thinking and creativity to further understand our world. Our curriculum design has deep links with Mathematics, English, Science, and Design and Technology. At the core of our computing curriculum is computer science, in which pupils are taught the principles of information and computation; how digital systems work, and how to put this knowledge to use through programming. Building on this *knowledge* and understanding, we intend for our children to use information technology to create programs and systems, within a range of content. By the end of Key Stage 2, we want our children to become digitally literate - to be able to use, and express themselves and develop their ideas through, information and communication technology - at a level suitable for the future workplace and as active participants in a digital world.

### Implementation:

Computing skills are taught both discretely and cross-curricular, supporting other areas of learning across the school. In Foundation and Key Stage 1, children are taught to use equipment and software confidently and purposefully, to communicate and handle information and to support their problem solving, recording and expressive skills. In Key Stage 2, our children extend their use of computing that they use for communication, investigation and programming and work to understand how to communicate safely. Our planned curriculum for digital literacy that includes online safety is broad in covering a range of issues.

Our Computing curriculum is designed to allow children time to think, discuss, practise, explore and embed. This allows time for teaching, practice and repetition - both in a year group and across both key stages. Curriculum coverage is mapped out carefully from Year 1 to Year 6, which allows some key concepts to be developed at a deeper level of learning, understanding and mastery. Fundamental *knowledge* and **skills** are covered at key points throughout the primary phase and repeated to allow pupils to build on what has been taught before. Where year groups are covering an area in more depth, this will be highlighted in green on the Curriculum Depth Map below. Lessons will be planned and a knowledge organiser provided for pupils, which outlines the area to be taught, where the new knowledge and skills fit in with their prior learning, any sticky knowledge they need to understand and key vocabulary they need to learn.

### Impact:

Impact is evidenced through:

- Proficient users of technology who are able to work both independently and collaboratively
- Computing hardware and software being utilised to enhance the learning outcomes of our children, across the curriculum.
- Clear progression in technical skills
- Demonstrating *knowledge* when using tools or **skills** in other areas of the curriculum and in enrichment opportunities both in and out of school
- A learning buzz as children engage in programming, instruct floor robots, prepare online safety presentations and design body confidence video campaigns
- The use and outcomes of the varied activities
- Low-stakes tests/quizzes

## Key Stage One

Year 1	Year 2
National Online Safety Microsoft Word 2Paint Microsoft Word Bee Bot	Microsoft PowerPoint Scratch Jnr  National Online Safety PowerPoint Ipad camera BeeBot  Chrome Music Lab I2Data Pictogram Scratch Jnr
<b>Computing Systems and Networks</b>	
Name the main parts of a computer	<i>Recognise the uses and features of information technology.</i>
<i>Use a mouse to open a program and select objects on a screen.</i>	<i>Identify information technology in the home, school and beyond.</i>
<i>Use a keyboard for typing.</i>	<b>Explain how information technology benefits us?</b>
Save work in their own folder.	
<b>Creating Media</b>	
Use tools, shapes and lines to create a digital painting.	<b>Create, review and edit music digitally.</b>
Compare computer art and painting.	<b>Use a digital device to take a photograph and use software to edit and improve it?</b>
Add and remove text in a program.	
Change the look of text on a computer.	
Compare writing on a computer with writing on paper.	
<b>Programming</b>	
<i>Understand what algorithms are</i>	<i>Understand what algorithms are.</i>
<i>Plan a simple program to move a floor robot forwards, backwards, left and right.</i>	<i>Understand that algorithms are implemented as programs on digital devices.</i>
<i>Plan and debug simple routes.</i>	<i>Understand that programs execute by following precise and unambiguous instructions.</i>
<i>Predict where the robot will move to.</i>	<b>Create and debug simple programs.</b>
Enter commands to move sprites.	<b>Use logical reasoning to predict the behaviour of own programs.</b>
Join commands together to make as simple program.	
Predict what will happen when changes are made to algorithms.	
<b>Data &amp; Information</b>	
Label, group and compare objects on screen.	<b>Use IT to enter data, present, sort and compare information.</b>
<b>Online safety</b>	
<i>Use technology safely, responsibly and respectfully.</i>	<b>Use technology safely, responsibly and respectfully.</b>
<i>Identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.</i>	<i>Know how to keep personal information private.</i>
	<i>Identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.</i>

## Key Stage Two

Year 3		Year 4		Year 5		Year 6	
Any painting program	J2data Branch & iMotion app	Audacity	Paint.NET	Google Slides	j2data Database	Google Sites	Tinkercad
Scratch	Pictogram	FMSLogo	Scratch	Microsoft Photos	Google Drawings	Scratch	micro:bit & Microsoft
	Adobe Spark	Data logger		Crumble	Scratch	Google Sheets or	MakeCode
						Microsoft Excel	
Computing systems and networks							
Explain how digital devices function		Describe how networks physically connect to other networks		Explain that computers can be connected together to form systems		Identify how to use a search engine	
Identify input and output devices		Recognise how networked devices make up the internet		Recognise the role of the computer systems in our lives		Describe how search engines select results	
Recognise how digital devices can change the way we work		Outline how websites can be shared via the World Wide Web		Recognise how information is transferred over the internet		Explain how search results are ranked	
Explain how a computer network can be used to share information		Describe how content can be added and accessed on the World Wide Web		Explain how sharing information online lets people in different places work together		Recognise why the order of results is important, and to whom	
Explore how digital devices can be connected		Recognise how the content of the WWW is created by people		Contribute to a shared project online		Recognise how we communicate using technology	
Recognise the physical components of a network		Evaluate the consequences of unreliable content		Evaluate different ways of working together online		Evaluate different methods of online communication	
Creating media							
Explain that animation is a sequence of drawings or photographs		Identify that sounds can be digitally recorded		Recognise video as moving pictures which can include audio		Review an existing website and consider its structure	
Relate animated movement with a sequence of images		Use a digital device to record sound		Identify digital devices that can record video		Plan the features of a webpage	
Plan an animation		Explain that a digital recording is stored as a file		Capture video using a digital device		Consider the ownership and use of images (copyright)	
Identify the need to work consistently and carefully		Explain that audio can be changed through editing		Recognise the features of an effective video		Recognise the need to preview pages	
Review and improve an animation		Show that different types of audio can be combined and played together		Identify that video can be improved through reshooting and editing		Outline the need for a navigation path	
Evaluate the impact of adding other media to an animation		Evaluate editing choices made		Consider the impact of choices made when making and sharing a video		Recognise the implications of linking content owned by other people	
Programming							
Explore a new programming environment		Identify that accuracy in programming is important		Control a simple circuit connected to a computer		Define a 'variable' as something that is changeable	
Identify that commands have an outcome		Create a program in a text-based language		Write a program that includes count-controlled loops		Explain why a variable is used in a program	
Explain that a program has a start		Explain what "repeat" means		Explain that a loop can stop when a condition is met e.g. Number of times		Choose how to improve a game by using variables	

<i>Recognise that a sequence of commands can have an order</i>	<b>Modify a count-controlled loop to produce a given outcome</b>	<i>Conclude that a loop can be used to repeatedly check whether a condition has been met</i>	<b>Design a project that builds on a given example</b>
<b>Change the appearance of a project</b>	<b>Decompose a task into small steps</b>	<b>Design a physical project that includes selection</b>	<b>Use my design to create a project</b>
<b>Create a project from a task description</b>	<b>Create a program that uses count controlled loops to produce a given outcome</b>	<b>Create a controllable system that includes selection</b>	<b>Evaluate my project</b>
<i>Explain how a sprite moves in an existing project</i>	<b>Develop the use of count-controlled loops in a different programming environment</b>	<i>Explain how selection is used in computer programs</i>	<b>Create a program to run on a controllable device</b>
<b>Create a program to move a sprite in 4 directions</b>	<i>Explain that in programming there are infinite loops and count-controlled loops</i>	<i>Relate that a conditional statement connects a condition to an outcome</i>	<i>Explain that selection can control the flow of a program</i>
<b>Adapt a program to a new context</b>	<b>Develop a design that includes two or more loops which run at the same time</b>	<i>Explain how selection directs the flow of a program</i>	<b>Update a variable with a user input</b>
<b>Develop a program by adding features</b>	<b>Modify an infinite loop in a given program</b>	<b>Design a program which uses selection</b>	<b>Use a conditional statement to compare a variable to a value</b>
<b>Identify and fix bugs in a program</b>	<b>Design a project that includes repetition</b>	<b>Create a program which uses selection</b>	<b>Design a project that uses inputs and outputs on a controllable device</b>
<b>Design and create a maze-based challenge</b>	<b>Create a project that includes repetition</b>	<b>Evaluate my program</b>	<b>Develop a program to use inputs and outputs on a controllable device</b>
<b>Data and information</b>			
<b>Create questions with yes/no answers</b>	<i>Explain that data gathered over time can be used to answer questions</i>	<b>Use a form to record information</b>	<b>Identify questions which can be answered using data</b>
<b>Identify the object attributes needed to collect relevant data</b>	<b>Use a digital device to collect data automatically</b>	<b>Compare paper and computer-based databases</b>	<i>Explain that objects can be described using data</i>
<b>Create a branching database</b>	<i>Explain that a data logger collects data points from sensors over time</i>	<b>Outline how grouping and then sorting data allows us to answer questions</b>	<i>Explain that formulas can be used to produce calculated data</i>
<i>Explain why is it helpful for a database to be well structured</i>	<b>Use data collected over a long duration to find information</b>	<i>Explain that tools can be used to select specific data</i>	<b>Apply formulas to data, including duplicating</b>
<b>Identify objects using a branching database</b>	<b>Identify the data needed to answer questions</b>	<i>Explain that computer programs can be used to compare data visually</i>	<b>Create a spreadsheet to plan an event</b>
<b>Compare information shown in a pictogram with a branching database</b>	<b>Use collected data to answer questions</b>	<b>Apply knowledge of a database to ask and answer real-world questions</b>	<b>Choose suitable ways to present data</b>
<b>Creating media</b>			
<i>Recognise how text and images convey information</i>	<i>Explain that digital images can be changed</i>	<i>Identify that drawing tools can be used to produce different outcomes</i>	<b>Use a computer to create and manipulate three-dimensional (3D) digital objects</b>
<i>Recognise that text and layout can be edited</i>	<b>Change the composition of an image</b>	<b>Create a vector drawing by combining shapes</b>	<b>Compare working digitally with 2D and 3D graphics</b>

<b>Choose appropriate page settings</b>	<i>Describe how images can be changed for different uses</i>	<b>Use tools to achieve a desired effect</b>	<b>Construct a digital 3D model of a physical object</b>
<b>Add content to a desktop publishing publication</b>	<i>Make good choices when selecting different editing tools</i>	<i>Recognise that vector drawings consist of layers</i>	<i>Know that physical objects can be broken down into a collection of 3D shapes</i>
<i>Consider how different layouts can suit different purposes</i>	<i>Recognise that not all images are real</i>	<b>Group objects to make them easier to work with</b>	<b>Design a digital model by combining 3D objects</b>
<i>Consider the benefits of desktop publishing</i>	<b>Evaluate how changes can improve an image</b>	<b>Evaluate a vector drawing</b>	<b>Develop and improve a digital 3D model</b>

## Online Safety

### Self-image and identity

<i>Explain what is meant by the term 'identity'.</i>	<i>Explain how my online identity can be different to my offline identity.</i>	<i>Explain how identity online can be copied, modified or altered.</i>	<b>Identify and critically evaluate online content relating to gender, race, religion, disability, culture and other groups, and explain why it is important to challenge and reject inappropriate representations online.</b>
<i>Explain how people can represent themselves in different ways online</i>	<b>Describe positive ways for someone to interact with others online and understand how this will positively impact on how others perceive them.</b>	<b>Demonstrate how to make responsible choices about having an online identity, depending on context.</b>	<b>Describe issues online that could make anyone feel sad, worried, uncomfortable or frightened. Know and can give examples of how to get help, both on and offline.</b>
<i>Explain ways in which someone might change their identity depending on what they are doing online and why.</i>	<i>Explain that others online can pretend to be someone else, including my friends, and can suggest reasons why they might do this.</i>		<i>Explain the importance of asking until getting the help needed.</i>

### Online relationships

<b>Describe ways people who have similar likes and interests can get together online.</b>	<b>Describe strategies for safe and fun experiences in a range of online social environments</b>	<b>Give examples of technology-specific forms of communication</b>	<i>Explain how sharing something online may have an impact either positively or negatively</i>
<i>Know &amp; explain what it means to 'know someone' online and why this might be different from knowing someone offline.</i>	<b>Give examples of how to be respectful to others online and describe how to recognise healthy and unhealthy online behaviours.</b>	<i>Explain that there are some people who communicate online who may want to do me or my friends harm.</i>	<b>Describe how to be kind and show respect for others online including the importance of respecting boundaries regarding what is shared about them online and support if others do not.</b>
<i>Explain what is meant by 'trusting someone online', why this is different from 'liking someone online', and why it is important to be careful about who to trust online including what information and content they are trusted with.</i>	<i>Explain how content shared online may feel unimportant to one person but may be important to other people's thoughts feelings and beliefs.</i>	<i>Recognise that this is not my / our fault.</i>	<b>Describe how things shared privately online can have unintended consequences for others</b>
<i>Know &amp; explain why someone may change their mind about trusting anyone with something if they feel nervous, uncomfortable or worried.</i>		<i>Describe some of the ways people may be involved in online communities and describe how they might collaborate constructively with others and make positive contributions</i>	<i>Explain that taking or sharing inappropriate images of someone, even if they say it is okay, may have an impact for the sharer and others; and who can help if someone is worried about this.</i>
<i>Know &amp; explain how someone's feelings can be hurt by what is said or written online.</i>		<i>Explain how someone can get help if they are having problems and identify when to tell a trusted adult.</i>	
		<b>Demonstrate how to support others (including those who are having difficulties) online.</b>	

Online reputation			
<i>Explain how to search for information about others online</i>	<b>Describe how to find out information about others by searching online.</b>	<b>Search for information about an individual online and summarise the information found.</b>	<i>Explain the ways in which anyone can develop a positive online reputation</i>
<b>Give examples of what anyone may or may not be willing to share about themselves online.</b>	<i>Explain ways that some of the information about anyone online could have been created, copied or shared by others.</i>	<b>Describe ways that information about anyone online can be used by others to make judgments about an individual and why these may be incorrect</b>	<i>Explain strategies anyone can use to protect their 'digital personality' and online reputation, including degrees of anonymity.</i>
<i>Explain the need to be careful before sharing anything personal.</i>			
<i>Explain who someone can ask if they are unsure about putting something online.</i>			
Online bullying			
<b>Describe appropriate ways to behave towards other people online and why this is important.</b>	<b>Recognise when someone is upset, hurt or angry online.</b>	<b>Recognise online bullying can be different to bullying in the physical world and can describe some of those differences.</b>	<b>Describe how to capture bullying content as evidence to share with others who can help me.</b>
<b>Give examples of how bullying behaviour could appear online and how someone can get support.</b>	<b>Describe ways people can be bullied through a range of media</b>	<b>Describe how what one person perceives as playful joking and teasing (including 'banter') might be experienced by others as bullying.</b>	<i>Explain how someone would report online bullying in different contexts.</i>
	<i>Explain why people need to think carefully about how content they post might affect others, their feelings and how it may affect how others feel about them (their reputation).</i>	<i>Explain how anyone can get help if they are being bullied online and identify when to tell a trusted adult</i>	
		<b>Identify a range of ways to report concerns and access support both in school and at home about online bullying</b>	
		<i>Explain how to block abusive users</i>	
		<b>Describe the helpline services which can help people experiencing bullying, and how to access them</b>	
Managing online information			
<b>Demonstrate how to use key phrases in search engines to gather accurate information online.</b>	<b>Analyse information to make a judgement about probable accuracy and I understand why it is important to make my own decisions regarding content and that my decisions are respected by others.</b>	<i>Explain the benefits and limitations of using different types of search technologies</i>	<i>Explain how search engines work and how results are selected and ranked.</i>
<i>Explain what autocomplete is and how to choose the best suggestion</i>	<b>Describe how to search for information within a wide group of technologies and make a judgement about the probable accuracy</b>	<i>Explain what is meant by 'being sceptical'; I can give examples of when and why it is important to be 'sceptical'.</i>	<i>Explain how to use search technologies effectively.</i>

<i>Explain how the internet can be used to sell and buy things</i>	<b>Describe some of the methods used to encourage people to buy things online (and can recognise some of these when they appear online)</b>	<b>Evaluate digital content and can explain how to make choices about what is trustworthy</b>	<b>Describe how some online information can be opinion and can offer examples.</b>
<i>Explain the difference between a 'belief', an 'opinion' and a 'fact. and can give examples of how and where they might be shared online,</i>	<i>Explain why lots of people sharing the same opinions or beliefs online do not make those opinions or beliefs true.</i>	<i>Explain key concepts including: information, reviews, fact, opinion, belief, validity, reliability and evidence.</i>	<i>Explain how and why some people may present 'opinions' as 'facts': why the popularity of an opinion or the personalities of those promoting it does not necessarily make it true, fair or perhaps even legal.</i>
	<i>Explain that technology can be designed to act like or impersonate living things and describe what the benefits and the risks might be.</i>	<b>Identify ways the internet can draw us to information for different agendas</b>	<b>Define the terms 'influence', 'manipulation' and 'persuasion' and explain how someone might encounter these online</b>
		<b>Describe ways of identifying when online content has been commercially sponsored or boosted,</b>	<b>Understand the concept of persuasive design and how it can be used to influences peoples' choices.</b>
		<i>Explain what is meant by the term 'stereotype', how 'stereotypes' are amplified and reinforced online, and why accepting 'stereotypes' may influence how people think about others.</i>	<b>Describe how to analyse and evaluate the validity of 'facts' and information and explain why using these strategies are important.</b>
		<b>Describe how fake news may affect someone's emotions and behaviour and explain why this may be harmful.</b>	<i>Explain how companies and news providers target people with online news stories they are more likely to engage with and how to recognise this.</i>
		<i>Explain what is meant by a 'hoax'.</i>	<b>Describe the difference between online misinformation and dis-information</b>
		<i>Explain why someone would need to think carefully before they share.</i>	<i>Explain why information that is on a large number of sites may still be inaccurate or untrue. Assess how this might happen</i>
			<b>Identify, flag and report inappropriate content.</b>
<b>Health, Well-being and Lifestyle</b>			
<i>Explain that not all opinions shared may be accepted as true or fair by others</i>	<i>Explain what is meant by fake news</i>	<b>Describe ways technology can affect health and well-being both positively</b>	<b>Describe common systems that regulate age-related content and describe their purpose.</b>
<b>Describe and demonstrate how we can get help from a trusted adult if we see content that makes us feel sad, uncomfortable, worried or frightened.</b>	<i>Explain how using technology can be a distraction from other things, in both a positive and negative way.</i>	<b>Describe some strategies, tips or advice to promote health and wellbeing with regards to technology</b>	<b>Recognise and discuss the pressures that technology can place on someone and how / when they could manage this.</b>
		<b>Recognise the benefits and risks of accessing information about health and well-being online and how we should balance this with talking to trusted adults and professionals</b>	<b>Recognise features of persuasive design and how they are used to keep users engaged (current and future use).</b>



		<i>Explain how and why some apps and games may request or take payment for additional content and explain the importance of seeking permission from a trusted adult before purchasing.</i>	<b>Assess and action different strategies to limit the impact of technology on health</b>
<b>Privacy and Security</b>			
<i>Explain why spending too much time using technology can sometimes have a negative impact on anyone;</i>	<b>Identify times or situations when someone may need to limit the amount of time they use technology</b>	<i>Explain what a strong password is and demonstrate how to create one.</i>	<b>Describe effective ways people can manage passwords</b>
<i>Explain why some online activities have age restrictions, why it is important to follow them and know who to talk to if others pressure them to watch or do something online that makes me feel uncomfortable</i>	<b>Describe strategies for keeping personal information private, depending on context.</b>	<i>Explain how many free apps or services may read and share private information with others.</i>	<i>Explain what to do if a password is shared, lost or stolen.</i>
<b>Describe simple strategies for creating and keeping passwords private.</b>	<i>Explain that internet use is never fully private and is monitored, e.g. adult supervision.</i>	<i>Explain what app permissions are and can give some examples.</i>	<b>Describe how and why people should keep their software and apps up to date,</b>
	<b>Describe how some online services may seek consent to store information, knowing how to respond appropriately</b>		<b>Describe simple ways to increase privacy on apps and services that provide privacy settings.</b>
			<b>Describe ways in which some online content targets people to gain money or information illegally; Describe strategies to help me identify such content</b>
			<i>Know that online services have terms and conditions that govern their use.</i>
<b>Copyright and Ownership</b>			
<b>Give reasons why someone should only share information with people they choose to and can trust.</b>	<i>Know what the digital age of consent is and the impact this has on online services asking for consent.</i>	<b>Assess and justify when it is acceptable to use the work of others</b>	<b>Describe the use of search tools to find and access online content which can be reused by others.</b>
<b>Describe how connected devices can collect and share anyone's information with others.</b>	<b>When searching on the internet for content to use explain why I need to consider who owns it and whether I have the right to reuse it.</b>	<b>Give examples of content that is permitted to be reused and know how this content can be found online.</b>	<b>Describe how to make references to and acknowledge sources I have used from the internet.</b>
<i>Explain why copying someone else's work from the internet without permission isn't fair and can explain what problems this might cause.</i>	<b>Give some simple examples of content which I must not use without permission from the owner, e.g. videos, music, images</b>		

## Appendix - Key Knowledge and Vocabulary

<b>COMPUTING - KS1</b>				
<b>Key Vocabulary</b>				
<u>Online Safety</u> rules online private information email	<u>Programming</u> instructions buttons robots patterns program	<u>Creating Media</u> videos sounds image bank word bank space bar	<u>Computing Systems &amp; Networks</u> purpose online tools communicate	<u>Data &amp; Information</u> photographs video sound data pictogram digitally
<b>Key Knowledge</b>			<b>Key Vocabulary</b>	
<b>Year 1 - Computing Systems and Networks</b>				
<ul style="list-style-type: none"> <li><input type="checkbox"/> Technology, which can be found at home and at school (interactive whiteboards, TV's, speakers, games consoles, mobile phones, Alexa) is something that is made with a specific purpose to help people.</li> <li><input type="checkbox"/> Work can be saved in specifically named 'folders' so it is not lost.</li> <li><input type="checkbox"/> Tapping on a keyboard allows you to write letters and words.</li> <li><input type="checkbox"/> Keyboard arrows can be used to move the text cursor into a textbox</li> <li><input type="checkbox"/> A mouse is used to control the small cursor on the screen.</li> <li><input type="checkbox"/> Computers can be turned on and then logged into</li> <li><input type="checkbox"/> Rules are needed so we can use computer technology safely</li> </ul>			desktop delete folder icon keyboard laptop logging on and off	mouse open save screen tablet technology turn on and off
<b>Creating Media</b>				
<ul style="list-style-type: none"> <li><input type="checkbox"/> 'Tools' can be used to edit and improve an image.</li> <li><input type="checkbox"/> Digital paintings are those created on a computer</li> <li><input type="checkbox"/> Word processing software allows you to write on a computer</li> <li><input type="checkbox"/> The text cursor shows where text will appear when we type</li> <li><input type="checkbox"/> Text can be edited using the bold, italic, and underline toolbar buttons; text style (font) can be amended within a piece of text</li> <li><input type="checkbox"/> Text can be selected by using the 'click and drag' method</li> </ul>			backspace bold brush size caps lock digital painting double click drag & drop eraser fill tool	font italic keyboard keys line tool pen tool select shape tool space bar spray tool text tools toolbar underline undo word processor
<b>Programming</b>				
<ul style="list-style-type: none"> <li><input type="checkbox"/> 'Bee-Bot' can be controlled by entering a series of instructions into its control panel.</li> <li><input type="checkbox"/> We can change the way Bee-Bot moves by debugging it.</li> <li><input type="checkbox"/> Algorithms are a set of clear, precise, and ordered instructions, and that a computer program is the implementation of an algorithm on a digital device.</li> <li><input type="checkbox"/> Reading 'code' is used to predict what a program will do.</li> </ul>			algorithm background bee-bot blocks buttons clear memory commands control panel	debug direction floor robot instructions program left turn memory predict right turn route run sequence sprite start command steps test value
<b>Data and Information</b>				
<ul style="list-style-type: none"> <li><input type="checkbox"/> Computers only do what humans tell them what to do.</li> <li><input type="checkbox"/> Labelling, grouping, and searching are important aspects of data and information. Searching is a common operation in many applications, and requires an understanding that to search data, it must have labels.</li> <li><input type="checkbox"/> The term 'object' is used to describe anything that can be labelled with properties, eg animals, pencils, or trees. When talking about objects, they are named to make it easier for humans to know what other humans are talking about, eg 'tree'. The name may change depending on context (sometimes 'tree' is enough, but sometimes 'oak tree' may be required), but it is always a property that an object can be labelled with.</li> <li><input type="checkbox"/> A label is a property used to describe an object, eg 'green'. This is the data that is collected about the object.</li> <li><input type="checkbox"/> A collection of data is called a 'data set'.</li> </ul>			count drag drop group input label sort	
<b>Online Safety</b>				
<ul style="list-style-type: none"> <li><input type="checkbox"/> There may be people online who could make someone feel sad, embarrassed or upset.</li> <li><input type="checkbox"/> If something happens that makes me feel sad, worried, uncomfortable or frightened it is important to speak to a trusted adult.</li> <li><input type="checkbox"/> Always ask permission before going online.</li> <li><input type="checkbox"/> Be kind online and respect people's choices; we need to behave online in ways that do not upset others.</li> <li><input type="checkbox"/> Information can stay online and could be copied.</li> <li><input type="checkbox"/> Passwords are used to protect information and should not be shared with others.</li> </ul>			deleted information internet online passwords	permission responsible trusted adult upload

<b>COMPUTING - KS1</b>				
<b>Key Vocabulary</b>				
<u>Online Safety</u> appropriate/inappropriate sites cyber-bullying digital footprint keyword searching	<u>Programming</u> forward backward turn algorithm sequence debug predict	<u>Creating Media</u> paint effects templates animation documents index finger typing enter/return caps lock backspace	<u>Computing Systems &amp; Networks</u> information sources communication purposes website content	<u>Data &amp; Information</u> questions data collection graphs charts save retrieve
<b>Key Knowledge</b>			<b>Key Vocabulary</b>	
<b>Year 2 - Computing Systems and Networks</b>				
<input type="checkbox"/> IT can be described as information technology <input type="checkbox"/> IT can be seen as computers, devices with computers inside, or things made to work with computers. <input type="checkbox"/> IT can be found all around us e.g barcodes, scanners, tills, chip & pin machines, crossing machines.			connected device information technology resize	
<b>Creating Media</b>				
<input type="checkbox"/> Many devices can be used to take photographs. <input type="checkbox"/> Photographs can be taken in portrait or landscape format. <input type="checkbox"/> Photographs can be improved with good lighting and focus. <input type="checkbox"/> Photographs can be changed by editing. <input type="checkbox"/> Images can be downloaded and saved <input type="checkbox"/> Pixlr is an online photo editing tool <input type="checkbox"/> A computer can be used to create and refine musical patterns			capture digital device landscape light source portrait retake unclear	
<b>Programming</b>				
<input type="checkbox"/> Algorithms are a set of clear, precise and ordered instructions. <input type="checkbox"/> A computer program carries out these instructions. <input type="checkbox"/> We can read 'code' and predict what a program will do. <input type="checkbox"/> More complicated tasks can be broken down into chunks and an algorithm written for each chunk. This is called 'decomposition'			chunks code commands decomposition errors goal instruction order outcome precise predict routes	
<b>Data &amp; Information</b>				
<input type="checkbox"/> Data can be organised effectively for counting and comparing <input type="checkbox"/> Objects can be grouped by attribute <input type="checkbox"/> Computers can be used to create tally charts and pictograms quickly and easily. <input type="checkbox"/> Data can be changed quickly and easily. <input type="checkbox"/> Data can be presented in different ways to suit different purposes.			compare record tally chart pictogram total	
<b>Online Safety</b>				
<input type="checkbox"/> Other people may look and act differently online. <input type="checkbox"/> Personal details should not be shared online e.g. age, address, phone number. <input type="checkbox"/> Online information can be seen by anyone and can last a long time. <input type="checkbox"/> Bullying can be done online and can upset others. <input type="checkbox"/> Anyone can put information online and some of it may not be true. <input type="checkbox"/> Too much use of technology can affect my wellbeing. <input type="checkbox"/> Some people may have devices in the home that are connected to the internet. <input type="checkbox"/> Passwords should be secure and kept private. <input type="checkbox"/> Content on the internet could belong to other people.			alexa browser bystanders keyword online bullying password pegi age restrictions pop-ups safety search engine security	

<b>COMPUTING - KS2</b>		
<b>Key Knowledge</b>		<b>Key Vocabulary</b>
<b>Year 3 - Computing systems and networks</b>		
<ul style="list-style-type: none"> <li><input type="checkbox"/> The difference between a digital device and a non-digital device is a digital device is capable of some processing i.e. it has functions beyond being on or off.</li> <li><input type="checkbox"/> IPO stands for input, process, output. It underpins all digital devices</li> <li><input type="checkbox"/> Some devices can have just one input which leads to several outputs, whilst others have many inputs which lead to a single output</li> <li><input type="checkbox"/> Information (data) flows around a computer network</li> <li><input type="checkbox"/> A network switch manages the way in which data moves around a network</li> <li><input type="checkbox"/> A server is a location to store files</li> <li><input type="checkbox"/> Wireless access points send and receive wireless signals from wireless devices such as tablets and laptops</li> </ul>	<ul style="list-style-type: none"> <li>connected</li> <li>digital devices</li> <li>inputs</li> <li>IT technician</li> <li>network switch</li> <li>networks</li> </ul>	<ul style="list-style-type: none"> <li>non-digital devices</li> <li>outputs</li> <li>printer</li> <li>processes</li> <li>server</li> <li>wireless access point</li> </ul>
<b>Creating media</b>		
<ul style="list-style-type: none"> <li><input type="checkbox"/> Animations are a series of still images stitched together to create a motion video</li> <li><input type="checkbox"/> Animations can be created using on-screen or off-screen (flipbooks) images.</li> <li><input type="checkbox"/> Software can be used to create on-screen animations</li> <li><input type="checkbox"/> 'Onion skinning' is showing part of a transparent photo to demonstrate the previous frame to make small movements more consistent</li> </ul>	<ul style="list-style-type: none"> <li>capturing</li> <li>desktop</li> <li>publishing</li> <li>digital</li> <li>editing</li> <li>modifying</li> </ul>	<ul style="list-style-type: none"> <li>still images</li> <li>stop-frame animation</li> </ul>
<b>Programming</b>		
<ul style="list-style-type: none"> <li><input type="checkbox"/> The order of sequencing when programming is important</li> <li><input type="checkbox"/> When programming there are 4 levels which can help describe a project - these are known as levels of abstraction: <ul style="list-style-type: none"> <li>➢ Task - what is needed</li> <li>➢ Design - what it should do</li> <li>➢ Code - how it is done</li> <li>➢ Running the code - what it does</li> </ul> </li> <li><input type="checkbox"/> In programming events cause actions</li> <li><input type="checkbox"/> The order of actions can have an impact on the outcome of a program</li> </ul>	<ul style="list-style-type: none"> <li>actions</li> <li>algorithms</li> <li>block-based</li> <li>programming</li> <li>events</li> <li>programs</li> <li>sequencing</li> <li>sprite</li> </ul>	
<b>Data and information</b>		
<ul style="list-style-type: none"> <li><input type="checkbox"/> A branching database is a collection of data organised in a tree structure using yes/no or true/false questions</li> <li><input type="checkbox"/> In computer science branching databases are known as binary trees</li> <li><input type="checkbox"/> A pictogram is a pictorial representation of information, usually used to present numerical data, such as common methods of transport amongst a group of people</li> <li><input type="checkbox"/> An attribute includes its name and a value e.g. a ball will have a colour which might be red; colour is the attribute name, red is the attribute value</li> </ul>	<ul style="list-style-type: none"> <li>attribute</li> <li>branch</li> <li>branching</li> <li>databases</li> <li>grouping</li> <li>interchangeable</li> <li>pictogram</li> </ul>	
<b>Online Safety</b>		
<ul style="list-style-type: none"> <li><input type="checkbox"/> Know what is meant by the term 'identity'.</li> <li><input type="checkbox"/> People can represent themselves in different ways online and the ways in which someone might change their identity depending on what they are doing online and why.</li> <li><input type="checkbox"/> There is a difference between a 'belief', an 'opinion' and a 'fact'.</li> <li><input type="checkbox"/> Some online activities have age restrictions, why it is important to follow them and know who to talk to if others pressure me to watch or do something online that makes me feel uncomfortable</li> <li><input type="checkbox"/> Copying someone else's work from the internet without permission isn't fair and can explain what problems this might cause.</li> </ul>	<ul style="list-style-type: none"> <li>bullying</li> <li>identity</li> <li>offline</li> <li>online</li> <li>search engines</li> <li>social media</li> </ul>	

<b>COMPUTING - KS2</b>		
<b>Key Knowledge</b>		<b>Key Vocabulary</b>
<b>Year 4 - Computing systems and networks</b>		
<ul style="list-style-type: none"> <li><input type="checkbox"/> Computers can form networks</li> <li><input type="checkbox"/> Data is routed around the internet</li> <li><input type="checkbox"/> The World Wide Web is part of the internet</li> <li><input type="checkbox"/> Websites are 'stored' and contain different elements such as text content, images, video etc</li> <li><input type="checkbox"/> There is a high volume of inaccurate, misleading or false content on the internet</li> <li><input type="checkbox"/> Search results are influenced by adverts and sponsored content</li> <li><input type="checkbox"/> Information can spread very quickly around the World Wide Web</li> </ul>	devices networks offline online	online content routers the internet world wide web
<b>Creating media</b>		
<ul style="list-style-type: none"> <li><input type="checkbox"/> Audacity is a program that is able to record sound</li> <li><input type="checkbox"/> Digital devices often have inputs and outputs</li> <li><input type="checkbox"/> Audio recordings can have ownership and copyright issues Audio can be edited, including altering the volume and fading sections of audio in and out</li> <li><input type="checkbox"/> Podcasts can be exported as an audio file</li> <li><input type="checkbox"/> Images can be searched for and saved from copyright-free websites, these can be 'fake' or 'real'</li> </ul>	audio editing capturing copyright crop	digital image edited podcast retouching
<b>Programming</b>		
<ul style="list-style-type: none"> <li><input type="checkbox"/> Algorithms are a precise set of ordered instructions, which can be turned into code</li> <li><input type="checkbox"/> Debugging code is finding and fixing problems within it</li> <li><input type="checkbox"/> Repetition is where actions or commands in programming are repeated</li> <li><input type="checkbox"/> Repeated commands can be placed into loops. Loops can be repeated indefinitely or set a number of times - the latter are called 'count-controlled loops'</li> <li><input type="checkbox"/> Code tracing is when someone reads through code line by line stating what will happen when the code runs</li> <li><input type="checkbox"/> Procedures are code snippets that are named and can be reused in their programming</li> <li><input type="checkbox"/> When programming there are 4 levels which can help describe a project - these are known as levels of abstraction: Task/Design/Code/Running</li> </ul>	algorithms block-based programming count-controlled loops debug drawing shapes infinite loops repetition in games repetition in shapes text-based programming	
<b>Data and information</b>		
<ul style="list-style-type: none"> <li><input type="checkbox"/> A data logger is a digital device that can collect data over time and store it</li> <li><input type="checkbox"/> Data loggers will usually have built-in sensors for light, temperature, and sound as well as the option to connect external sensors</li> <li><input type="checkbox"/> Input devices such as keyboards, mice and microphones allow data to be entered into a computer</li> <li><input type="checkbox"/> A sensor is a type of input designed to allow computers to capture data from the physical environment: temperature, light, sound, humidity, pressure etc</li> <li><input type="checkbox"/> Data loggers capture data at given time intervals, which is a regular time period between each data capture and can vary according to the experiment</li> </ul>	capture data data logging investigation sensors	
<b>Online Safety</b>		
<ul style="list-style-type: none"> <li><input type="checkbox"/> Know what the digital age of consent is and the impact this has on online services asking for consent</li> <li><input type="checkbox"/> Internet use is never fully private and is monitored</li> <li><input type="checkbox"/> Know what is meant by fake news</li> <li><input type="checkbox"/> Using technology can be a distraction, in both a positive and negative way.</li> <li><input type="checkbox"/> Technology can be designed to act like or impersonate living things and describe what the benefits and the risks might be</li> <li><input type="checkbox"/> Information about anyone online could have been created, copied or shared by others.</li> </ul>	consent gaming platforms identity impersonate in-app purchases interact livestreaming	offline online pop-ups reputation social media technology

COMPUTING - KS2	
Key Knowledge	Key Vocabulary
<b>Year 5 - Computing systems and networks</b>	
<ul style="list-style-type: none"> <li><input type="checkbox"/> Computers can be connected together to form systems</li> <li><input type="checkbox"/> Systems are built using a number of parts</li> <li><input type="checkbox"/> Computer systems are designed to help us</li> <li><input type="checkbox"/> Parts of a computer system are not always in the same country. Information can be transferred using the internet</li> <li><input type="checkbox"/> Every computer has a unique address called an IP address</li> <li><input type="checkbox"/> Rules that computers have for communicating with one another are called protocols</li> </ul>	digital systems IP address protocols sharing information
<b>Creating media</b>	
<ul style="list-style-type: none"> <li><input type="checkbox"/> Video is defined as moving pictures which can include audio</li> <li><input type="checkbox"/> AV devices are those which fully integrate audio and visual</li> <li><input type="checkbox"/> Vector images are made up of shapes</li> <li><input type="checkbox"/> Google Drawings is software that can be used for vector drawing</li> <li><input type="checkbox"/> Digital images can be made using either shapes or pixels</li> </ul>	capturing creating images editing video layers and groups of objects planning vector drawing video editing
<b>Programming</b>	
<ul style="list-style-type: none"> <li><input type="checkbox"/> Crumble is programming software that uses the same drag-and-drop style as Scratch. It allows you to write programs that turn LEDs (Sparkles) on and off, change LED colours, spin motors, use push switches as inputs, and combine a number of these peripherals.</li> <li><input type="checkbox"/> Repetition is used in programming to give the same instruction or set of instructions several times. Repetition uses loops as the means to give these instructions.</li> <li><input type="checkbox"/> An infinite loop: a loop that commands the instruction/set of instructions to repeat forever.</li> <li><input type="checkbox"/> A count-controlled loop: a form of repetition in which a set of commands are carried out a specific number of times.</li> <li><input type="checkbox"/> A condition-controlled loop is a form of repetition in which a set of commands stop being carried out when a condition is met.</li> <li><input type="checkbox"/> Conditions are statements that need to be met for a set of actions to be carried out. They can be used in algorithms and programs to control the flow of actions.</li> <li><input type="checkbox"/> Selection is a decision within a computer program when the program decides to move on based on the results of an event</li> </ul>	algorithms count-controlled loops debug drawing shapes repetition in shapes text-based programming
<b>Data and information</b>	
<ul style="list-style-type: none"> <li><input type="checkbox"/> A flat-file database is a collection of data organised in a single table</li> <li><input type="checkbox"/> The term database means a collection of organised data that is stored on a computer</li> <li><input type="checkbox"/> Databases allow people to search and sort large quantities of data to find information</li> <li><input type="checkbox"/> Data records can be 'grouped' or 'sorted' based on different fields</li> <li><input type="checkbox"/> A database is composed of 'records' which are sets of data on a particular object</li> <li><input type="checkbox"/> Records are formed from one or more 'fields' of data. A field is one specific piece of data in a database record</li> <li><input type="checkbox"/> The value within the record is the 'answer' to each field</li> <li><input type="checkbox"/> All objects have attributes. An attribute includes its name and a value</li> </ul>	create charts flat-file databases order data
<b>Online Safety</b>	
<ul style="list-style-type: none"> <li><input type="checkbox"/> Know what a strong password is and demonstrate how to create one.</li> <li><input type="checkbox"/> Understand that many free apps or services may read and share private information with others.</li> <li><input type="checkbox"/> Some apps and games may request or take payment for additional content and explain the importance of seeking permission from a trusted adult before purchasing</li> <li><input type="checkbox"/> Know what is meant by the term 'stereotype', how 'stereotypes' are amplified and reinforced online, and why accepting 'stereotypes' may influence how people think about others.</li> <li><input type="checkbox"/> A hoax is a false warning about something. A virus hoax is a warning about a computer virus - typically, the warning arrives in an email note or is distributed through a note in a company's internal network.</li> <li><input type="checkbox"/> Help is available if some is being bullied online</li> <li><input type="checkbox"/> Abusive users can be blocked</li> </ul>	emojis gifs/ memes modified offline online online bullying pop-ups social media groups stereotypes targeted adverts voice activation

<b>COMPUTING - KS2</b>	
<b>Key Knowledge</b>	<b>Key Vocabulary</b>
<b>Year 6 - Computing systems and networks</b>	
<ul style="list-style-type: none"> <li><input type="checkbox"/> The 2 most common methods of searching are by using a search engine and the address bar</li> <li><input type="checkbox"/> Search engines are necessary to help us find things on the World Wide Web</li> <li><input type="checkbox"/> Search engines return different amounts of results</li> <li><input type="checkbox"/> Search engines select and rank results on specific criteria</li> <li><input type="checkbox"/> Search engines can have limitations and some things cannot be searched for</li> </ul>	internet communication search world wide web
<b>Creating media</b>	
<ul style="list-style-type: none"> <li><input type="checkbox"/> Websites are created for a chosen purpose</li> <li><input type="checkbox"/> Websites are written in HTML code</li> <li><input type="checkbox"/> Websites can contain different types of media</li> <li><input type="checkbox"/> Copyright-free images can be searched for and should only be used on websites</li> <li><input type="checkbox"/> Hyperlinks send you to someone else's work instantly after clicking a word, symbol or image</li> <li><input type="checkbox"/> Tinkercad is a website which allows you to create, select and move 3D objects</li> <li><input type="checkbox"/> Objects in Tinkercad can be viewed from different angles, resized, repositioned and altered, rotated and positioned</li> </ul>	3d modelling aesthetics computer models of physical objects copyright creating designing navigation webpage creation
<b>Programming</b>	
<ul style="list-style-type: none"> <li><input type="checkbox"/> Variables can be used, set and changed through the running of a program</li> <li><input type="checkbox"/> Variables can hold a single value at a time</li> <li><input type="checkbox"/> When programming there are 4 levels which can help describe a project - these are known as levels of abstraction. Task - what is needed; Design - what it should do; Code - how it is done; Running the code - what it does</li> <li><input type="checkbox"/> The micro:bit is an input, process, output device that can be programmed</li> </ul>	captures inputs coding designing sensing variables in games
<b>Data and information</b>	
<ul style="list-style-type: none"> <li><input type="checkbox"/> Data can be words, numbers, dates, images, sounds, etc. without context is important.</li> <li><input type="checkbox"/> A data set is a collection of related data that can be modified using a computer</li> <li><input type="checkbox"/> Organising data is an important aspect of data and information. It supports the use of calculations and provides the opportunity to use sorting and filtering, which enables ease of use and reduces human error.</li> <li><input type="checkbox"/> Formatting by applying number formats to alter cells changes how a spreadsheet interacts with the data and is different to applying style formatting, which only changes the appearance of data.</li> </ul>	calculate data cells formulas organise spreadsheets
<b>Online Safety</b>	
<ul style="list-style-type: none"> <li><input type="checkbox"/> Know what to do if a password is shared, lost or stolen.</li> <li><input type="checkbox"/> Online services have terms and conditions that govern their use.</li> <li><input type="checkbox"/> Some people may present 'opinions' as 'facts'; why the popularity of an opinion or the personalities of those promoting it does not necessarily make it true, fair or perhaps even legal.</li> <li><input type="checkbox"/> Companies and news providers target people with online news stories they are more likely to engage with and how to recognise this.</li> <li><input type="checkbox"/> It is important to report online bullying to a trusted adult</li> <li><input type="checkbox"/> It is important to develop a positive online reputation</li> <li><input type="checkbox"/> Protect your 'digital personality' and online reputation, including degrees of anonymity.</li> <li><input type="checkbox"/> Taking or sharing inappropriate images of someone, even if they say it is okay, may have an impact for the sharer and others; and who can help if someone is worried about this.</li> </ul>	age-related content auto-updates inappropriate images offline/online online bullying online content online reputation screen-grabs