

# Computing Curriculum Progression Early Years to Year 6



## Computing at Mandale Mill Primary School-

At Mandale Mill Primary School, we strive to deliver a high-quality Computing curriculum which allows our pupils to recognise the significance of digital technology in their everyday lives. We explicitly teach pupils the skills and knowledge they need to become creative, digitally literate, computational thinkers.

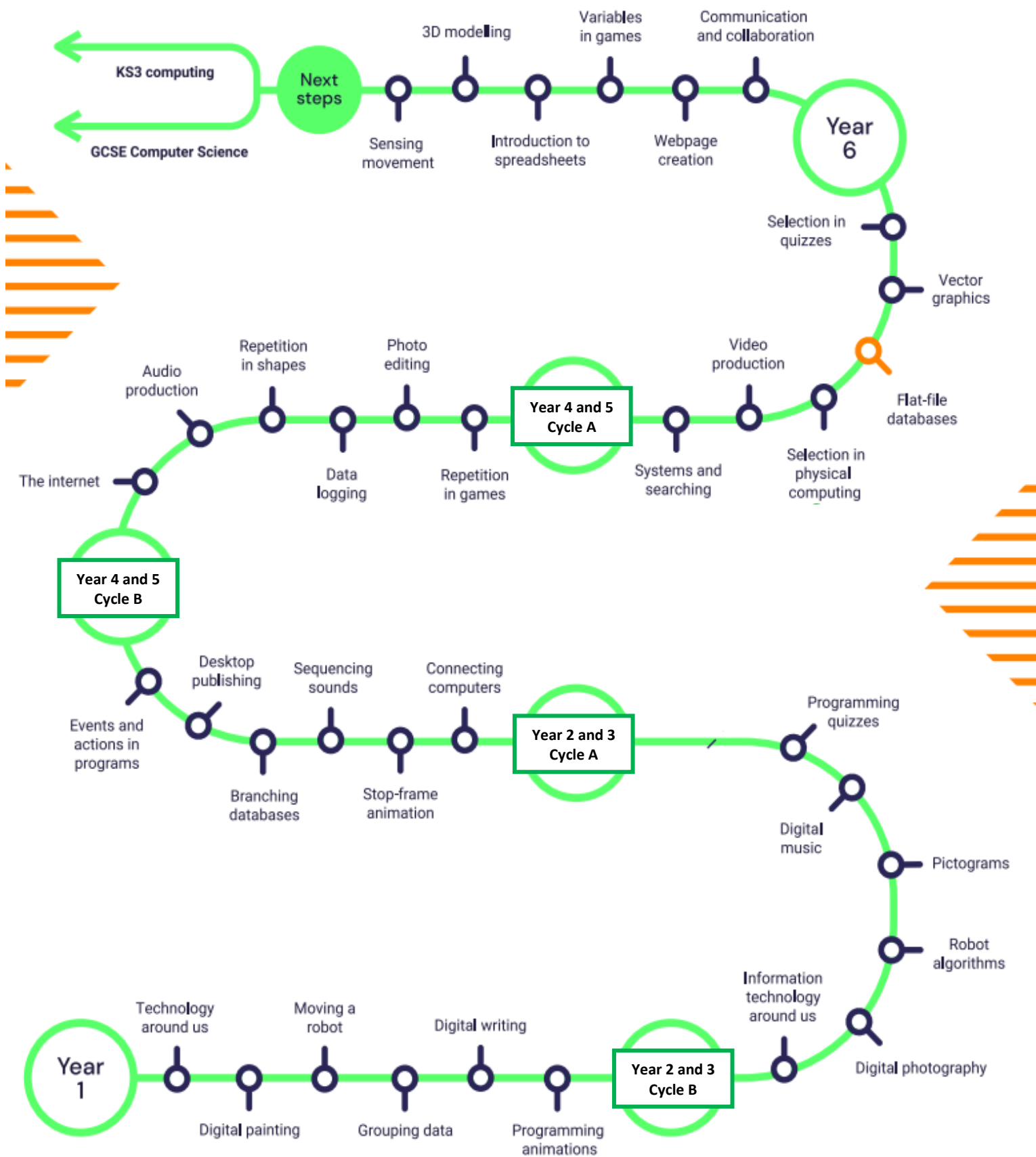
We encourage curiosity about digital technology and encourage our pupils to ask questions about the digital systems around them. We explore how technology is used in the real world and how to use it in a safe and responsible way. We ensure all children are exposed to high-quality Computing teaching and a range of learning experiences.

By teaching Computing, we intend to impart pupils with the knowledge, understanding, confidence, attitudes, values and skills they need in order to reach their potential as individuals in an increasingly technological society and in the digital community.

We teach the curriculum using the Teach Computing scheme which was developed by the National Centre of Computing Education.

**This document should be read in conjunction with the subject policy, the Teaching and Learning Policy and the Long-Term plan for each year group.**





# Computing roadmap-






\*Edited from Teach Computing road map

# Overarching principles-

## Key knowledge and skills-

Programming	Using Computers	Handling Data	Online Safety
<p>Programming is the process of writing computer programs. These are a series of instructions given to a computer in order to carry out certain operations and help the computer to run smoothly.</p>	<p>Today, a computer refers to an electronic device that can input, output, store and process information, otherwise known as 'data'.</p>	<p>Handling data explores how data is collected using digital devices in response to questions, and how it is organised into tables, records and fields on a computer system where it can be shared with other users.</p>	<p>Being safe online means individuals are protecting themselves and others from online harms and risks which may jeopardise their personal information, lead to unsafe communications or even effect their mental health and wellbeing.</p>
			

Creating Media		
Text	Image	Multimedia
		
<p>Select and create a range of media including text, images, sounds, and video using a range of computer devices.</p>		

## Key skills and knowledge progression-

Year Group(s)	Programming	Using Computers	Handling Data	Creating Media
<p><b>Reception and Year 1</b></p>	<ul style="list-style-type: none"> <li>• I can follow an instruction</li> <li>• Recognise that the order of instructions in an algorithm is important</li> <li>• Combine four direction commands to make sequences Control a floor robot</li> <li>• Create algorithms for sprites</li> <li>• Debug my program Plan a simple program</li> <li>• Use commands to move a sprite</li> <li>• Use a Start block in a program</li> <li>• Explain that each sprite has its own instructions Add programming blocks based on my algorithm Test the programs I have created</li> <li>• Explain what my program should do</li> <li>• Predict the outcome of a command on a device</li> <li>• Predict the outcome of a sequence involving forwards and backwards commands</li> </ul>	<ul style="list-style-type: none"> <li>• Identify technology</li> <li>• Explain technology as something that helps us</li> <li>• Identify a computer and its main parts (screen, mouse, keyboard)</li> <li>• Use a mouse in different ways</li> <li>• Use a keyboard to type on a computer Save and open my work</li> </ul>	<ul style="list-style-type: none"> <li>• Label objects</li> <li>• Identify that objects can be counted</li> <li>• Describe properties</li> <li>• Count and group objects</li> </ul>	<p><b>TEXT-</b></p> <ul style="list-style-type: none"> <li>• Use letters, numbers, space and back key Type capital letters</li> <li>• Use the arrow keys to move the cursor Use bold, italic and underline</li> <li>• Change the font style, size and colour</li> <li>• Explain why I used the tools that I choose</li> </ul> <p><b>IMAGES-</b></p> <ul style="list-style-type: none"> <li>• Use the freehand, shape, fill and line tools</li> <li>• Change colour and brush styles</li> <li>• Make careful choices when painting a digital painting</li> </ul> <p><b>MULTIMEDIA-</b> N/A</p>

	<ul style="list-style-type: none"> <li>• Predict the outcome of a sequence involving up to four commands</li> </ul>			
<p><b>Year 2 and Year 3</b></p>	<ul style="list-style-type: none"> <li>• Successfully modify a program</li> <li>• Create a sequence of commands using a block language to produce a given outcome</li> <li>• Use an event block to start a program</li> <li>• Debug errors to accomplish specific goals</li> <li>• Explain the order (sequence) of commands can effect the outcome (same commands, different order -&gt; same or different outcome)</li> <li>• Identify different sequences can achieve the same outcome</li> <li>• Work with others to decompose a problem into smaller steps in planning a project</li> </ul>	<ul style="list-style-type: none"> <li>• Explain how digital devices function (input, output, process)</li> <li>• Identify input and output devices</li> <li>• Explain how a computer network can be used to share information</li> <li>• Recognise the physical components of a network</li> <li>• Search for information in a single site</li> <li>• Understand that search engines select pages according to keywords found in the content</li> </ul>	<ul style="list-style-type: none"> <li>• Identify object attributes needed to collect relevant data</li> <li>• Create a branching database</li> <li>• Identify objects using a branching database</li> <li>• Compare branching database structures and comment on their effectiveness</li> <li>• Compare information shown in a pictogram with a branching database</li> <li>• Explain that data can be used to answer questions</li> </ul>	<p><b>TEXT-</b></p> <ul style="list-style-type: none"> <li>• Identify the advantages and disadvantages of using text and images</li> <li>• Change font style, size and colour for a given purpose</li> <li>• Consider how different layouts can suit different purposes</li> <li>• Define the term 'page orientation'</li> <li>• Type with increased confidence and speed using age appropriate punctuation</li> <li>• Recognise a document can be formatted with placeholders</li> <li>• Identify the use of desktop publishing in the real world</li> </ul> <p><b>IMAGES-</b></p> <ul style="list-style-type: none"> <li>• Change orientation of images</li> </ul> <p><b>MULTIMEDIA-</b></p> <ul style="list-style-type: none"> <li>• Understand how animation works</li> <li>• Plan an animation</li> <li>• Use onion skinning to create small changes between frames</li> <li>• Review and improve an</li> </ul>

				<ul style="list-style-type: none"> <li>• animation</li> <li>• Add and evaluate the impact of adding other media to an</li> <li>• animation</li> </ul>
<p><b>Year 4 and Year 5</b></p>	<ul style="list-style-type: none"> <li>• Plan a program which includes selection to produce a given outcome</li> <li>• Debug errors in increasingly complex programs to accomplish specific goals</li> <li>• Evaluate the effectiveness of a program and ways it could be improved</li> <li>• Identify patterns (repetition) in a sequence</li> <li>• Understand repetition in programming is also called looping</li> <li>• Identify a loop in a program</li> <li>• Understand, identify and justify when to use 'infinite' or 'count- controlled' loops</li> <li>• Explain the importance in instruction order in a loop</li> <li>• Plan a solution to a problem using decomposition</li> </ul>	<ul style="list-style-type: none"> <li>• Explain that computers can be connected together to form systems</li> <li>• Describe a computer system</li> <li>• Recognise the role of computer systems in our lives</li> <li>• Recognise how information is transferred over the internet using packets</li> <li>• Explain how sharing information online lets people in different places work together</li> <li>• Contribute to a shared project online</li> <li>• Evaluate different ways of working together online</li> </ul>	<ul style="list-style-type: none"> <li>• Collect data using a digital device</li> <li>• Recognise that a sensor can be used as an input device for data collection</li> <li>• Use a larger data set to find information</li> <li>• Use a computer program to sort data by one attribute</li> <li>• Export information and present data in a table and a graph</li> <li>• Interpret data that has been collected and draw conclusions</li> <li>• Choose tools to select and analyse data to answer questions</li> <li>• Use 'AND' and 'OR' to refine data selection</li> <li>• Select an appropriate graph to visually compare data</li> </ul>	<p><b>TEXT-</b></p> <ul style="list-style-type: none"> <li>• Use cross-curricular opportunities to consolidate previous learning from Year 1 – Year 3</li> </ul> <p><b>IMAGES-</b></p> <ul style="list-style-type: none"> <li>• Use a computer to (further) manipulate</li> <li>• images</li> <li>• Change the composition of an image</li> <li>• Recognise images can be changed for different purposes</li> <li>• Describe positive and negative effects that retouching can have on an image</li> <li>• Use the most appropriate tool for a particular purpose</li> </ul> <p><b>MULTIMEDIA-</b></p> <ul style="list-style-type: none"> <li>• Identify the features of a good video</li> <li>• Plan a video production using a story board</li> <li>• Use a computer to make a video</li> </ul>



				<ul style="list-style-type: none"> <li>• Make edits to a video to improve the outcome</li> <li>• Consider the impact of changes made on the quality of the video</li> </ul>
Year 6	<ul style="list-style-type: none"> <li>• Plan a program which includes variable to produce a given outcome</li> <li>• Test programs on an emulator</li> <li>• Use a range of approaches to debug errors in increasingly complex programs to accomplish specific goals</li> <li>• Define 'variable' as something that is changeable</li> <li>• Explain that a variable has a name and a value</li> <li>• Identify a variable in an existing program</li> <li>• Use a variable in a conditional statement to control the flow of a program</li> <li>• Program a microcontroller with selection and variables</li> <li>• Solve problems using decomposition, tackling each part separately</li> </ul>	<ul style="list-style-type: none"> <li>• Describe different ways people communicate online</li> <li>• Choose a method of communication to suit a particular purpose</li> <li>• Use of a range of search engines appropriate to finding information that is required</li> <li>• Understand that search engines rank pages based on the number and quality of inbound links</li> </ul>	<ul style="list-style-type: none"> <li>• Identify questions that can be answered using data</li> <li>• Create a spreadsheet for a purpose</li> <li>• Apply a formula that can be used to produce calculated data</li> <li>• Recognise data can be calculated using different operations</li> <li>• Evaluate results in comparison to the question asked</li> <li>• Choose suitable ways to presents data such as a graph</li> </ul>	<p><b>TEXT-</b></p> <ul style="list-style-type: none"> <li>• Recognise components of a webpage layout</li> <li>• Create a webpage including text, images, hyperlinks and embedded content</li> <li>• Understand the need for a navigation path</li> </ul> <p><b>IMAGES-</b></p> <ul style="list-style-type: none"> <li>• Create 3D graphical objects on a computer</li> <li>• Rotate and re-position a 3D space</li> <li>• Modify multiple 3D objects</li> <li>• Combine 3D objects to create desired effect</li> <li>• Apply blank 3D objects as placeholders to create holes</li> </ul> <p><b>MULTIMEDIA-</b></p> <ul style="list-style-type: none"> <li>• Use cross -curricular opportunities to consolidate previous learning from Year 1 – Year 5</li> </ul>

## Online Safety

Strand	Reception	Year 1	Year 2 and Year 3	Year 4 and Year 5	Year 6
<b>Privacy and Security</b>	<ul style="list-style-type: none"> <li>To identify some simple examples of my personal information.</li> </ul>	<ul style="list-style-type: none"> <li>To recognise more detailed examples of information that is personal to me.</li> </ul>	<ul style="list-style-type: none"> <li>To describe how online information about me could be seen by others.</li> <li>To give reasons why I should only share information with people I choose to and can trust.</li> </ul>	<ul style="list-style-type: none"> <li>To explain that others online can pretend to be me or other people, including my friends.</li> <li>To create and use strong and secure passwords.</li> </ul>	<ul style="list-style-type: none"> <li>To use different passwords for a range of online services.</li> <li>To know what to do if my password is lost or stolen.</li> </ul>
<b>Online Relationships</b>	<ul style="list-style-type: none"> <li>To recognise some ways in which the internet can be used to communicate.</li> </ul>	<ul style="list-style-type: none"> <li>To use the internet with adult support to communicate with people I know.</li> </ul>	<ul style="list-style-type: none"> <li>To use the internet to communicate with people I don't know well (e.g. email a penpal in another school/ country).</li> <li>To give examples of technology-specific forms of communication (e.g. emojis, acronyms, text speak).</li> </ul>	<ul style="list-style-type: none"> <li>To describe strategies for safe and fun experiences in a range of online social environments.</li> <li>To explain that there are some people I communicate with online who may want to do me or my friends harm. I can recognise that this is not my/our fault.</li> </ul>	<ul style="list-style-type: none"> <li>To show I understand my responsibilities for the well-being of others in my online social group.</li> </ul>
<b>Health, Well-being and Lifestyle</b>	<ul style="list-style-type: none"> <li>To identify rules that help keep us safe and healthy in and beyond the home when using technology.</li> </ul>	<ul style="list-style-type: none"> <li>To explain rules to keep us safe when we are using technology both in and beyond the home.</li> </ul>	<ul style="list-style-type: none"> <li>To explain simple guidance for using technology in different environments and settings.</li> <li>To explain why spending too</li> </ul>	<ul style="list-style-type: none"> <li>To explain how using technology can distract me from other things I might do or should be doing.</li> <li>To describe ways technology</li> </ul>	<ul style="list-style-type: none"> <li>To describe common systems that regulate age-related content (e.g. PEGI, BBFC and parental warnings) and describe their purpose.</li> </ul>

			<ul style="list-style-type: none"> <li>• much time using technology can sometimes have a negative impact on me; I can give some examples of activities where it is easy to</li> <li>• spend a lot of time engaged.</li> </ul>	<ul style="list-style-type: none"> <li>• can affect healthy sleep and can describe some of the issues.</li> </ul>	
<b>Online Bullying</b>	<ul style="list-style-type: none"> <li>• To describe ways that some people can be unkind online.</li> </ul>	<ul style="list-style-type: none"> <li>• To describe how to behave online in ways that do not upset others and can give examples.</li> </ul>	<ul style="list-style-type: none"> <li>• To explain what bullying is, how people may bully others and how bullying can make someone feel.</li> <li>• To describe appropriate ways to behave towards other people online and why this is important.</li> </ul>	<ul style="list-style-type: none"> <li>• To recognise when someone is upset, hurt or angry online.</li> <li>• To recognise online bullying can be different to bullying in the physical world and can describe some of those differences.</li> </ul>	<ul style="list-style-type: none"> <li>• To describe how to capture bullying content as evidence (e.g. screenshot, URL, profile) to share with others who can help me.</li> </ul>
<b>Online Reputation</b>	<ul style="list-style-type: none"> <li>• To identify ways that I can put information on the internet.</li> </ul>	<ul style="list-style-type: none"> <li>• To recognise that information can stay online and could be copied.</li> </ul>	<ul style="list-style-type: none"> <li>• To explain how information put online about someone can last for a long time.</li> <li>• To explain how to search for information about others online.</li> </ul>	<ul style="list-style-type: none"> <li>• To describe how to find out information about others by searching online.</li> <li>• To search for information about an individual online and summarise the information found.</li> </ul>	<ul style="list-style-type: none"> <li>• To explain the ways in which anyone can develop a positive online reputation.</li> </ul>
<b>Managing Online Information</b>	<ul style="list-style-type: none"> <li>• To talk about how to use the internet as a way of finding information online.</li> </ul>	<ul style="list-style-type: none"> <li>• To give simple examples of how to find information using digital technologies.</li> </ul>	<ul style="list-style-type: none"> <li>• To use simple keywords in search engines.</li> <li>• To demonstrate how to use key phrases in search engines to gather accurate information online.</li> </ul>	<ul style="list-style-type: none"> <li>• To analyse information to make a judgement about probable accuracy and I understand why it is important to make my own decisions regarding content.</li> <li>• To evaluate digital content</li> </ul>	<ul style="list-style-type: none"> <li>• To define the terms 'influence', 'manipulation' and 'persuasion' and explain how someone might encounter these online.</li> </ul>

				<ul style="list-style-type: none"> <li>• and can explain how to make choices about what is trustworthy e.g. differentiating between adverts and search results.</li> </ul>	
<b>Self-image &amp; Identify</b>	<ul style="list-style-type: none"> <li>• To recognise that I can say 'no' 'please stop' 'I'll tell' 'I'll ask' to somebody who asks me to do something that</li> <li>• makes me feel sad, embarrassed or upset.</li> </ul>	<ul style="list-style-type: none"> <li>• To recognise that there may be people online who could make me feel sad, embarrassed or upset.</li> </ul>	<ul style="list-style-type: none"> <li>• To explain how other people's identity online can be different to their identity in real life.</li> <li>• To explain how I can represent myself in different ways online.</li> </ul>	<ul style="list-style-type: none"> <li>• To explain how my online identity can be different to the identity I present in 'real life'.</li> <li>• To explain how identity online can be copied, modified or altered.</li> </ul>	<ul style="list-style-type: none"> <li>• To describe ways in which media can shape ideas about gender.</li> </ul>
<b>Copyright and Ownership</b>	<ul style="list-style-type: none"> <li>• To know that work I create</li> <li>• belongs to me.</li> </ul>	<ul style="list-style-type: none"> <li>• To explain why work I create</li> <li>• using technology belongs to me and say why it belongs to me.</li> </ul>	<ul style="list-style-type: none"> <li>• To recognise that content on</li> <li>• the internet may belong to other people.</li> <li>• To explain why copying</li> <li>• 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>• When searching on the internet for content to use, I can explain why I need to consider who owns it and whether I have the right to reuse it.</li> <li>• To assess and justify when it is</li> <li>• acceptable to use the work of others.</li> </ul>	<ul style="list-style-type: none"> <li>• To demonstrate the use of</li> <li>• search tools to find and access online content which can be reused by others.</li> </ul>