

## Progression map for ICT at Chandag Junior School

### **Intentions – Children will learn to:**

- use a combination of cross curricular embedding of computing, ELim Planning scheme of work, and Barefoot Computing to deliver a high quality computing curriculum
- understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
- analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
- evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
- be responsible, competent, confident and creative users of information and communication technology.

### **Implementation:**

- **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
- **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
- **use technology safely**, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

**Impact:** A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems. The core of computing 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, pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that pupils become digitally literate – 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.

KNOWLEDGE	NC subject content	Year 3	Year 4	Year 5	Year 6
<b>What is computing and how computers work?</b>	-Can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation	Identify computer systems in our lives including the inputs and outputs, explain how they work and their benefits to our lives <ul style="list-style-type: none"> <li>• What is a computer?</li> </ul>	Understand that programs are needed for computer systems to work and this is known as software. <ul style="list-style-type: none"> <li>• What apps do you use? What is an app?</li> </ul>	Understand that a computer system comprises input, process, memory and output <ul style="list-style-type: none"> <li>• What is a computer?</li> </ul>	Understand there are many different types of software / applications and understand the role they play in our lives.

	-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			<ul style="list-style-type: none"> <li>• What inputs and outputs do you know?</li> <li>• Can a computer think? (No! It processes millions of calculations very quickly...)</li> </ul>	How to represent information with electricity: basic binary, text, image, sound.
<b>Understanding and using Networks</b>	-understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration -Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content	<b>What is a network?</b> Daily life networks Map drawing Discussions of how and why useful (communication and collaboration)  Start understanding of computer network by using home examples,  <b>How do search engines work?</b> Know that there are multiple search engines and experience using of multiple	<b>What is a computer network?</b> Collection of computer systems and other devices connected together to communicate with each other by exchanging data <ul style="list-style-type: none"> <li>- Switch</li> <li>- Server</li> <li>- Router</li> <li>- Firewall</li> <li>- Wireless access</li> <li>- Wireless devices</li> </ul> Wired devices <b>How do search engines work?</b> Type in a URL to find a website Add websites to a favourites list Use a search engine to find a range of media e.g. images, texts	<b>What is the internet?</b> Build on understanding of computer networks explaining the internet is a way of connecting all these 'smaller' networks <ul style="list-style-type: none"> <li>- IP address</li> <li>- packets</li> </ul> World Wide Web and difference with the internet  <b>How do search engines work?</b> -classroom search engine activity -searching techniques -key words -Think of search terms to use linked with questions they wish to answer - talk about the reliability of information on the internet, e.g. the difference between fact and opinion	<b>How do search engines work?</b> - Billions of webpages, so how does the search engine know which one you want? classroom search engine activity with ranking system -u search engine as an index -spiders -key words -page rank: formula using how many links point to it -searching techniques - use strategies to check the reliabilities of information - use their knowledge of domain names to aid their judgment of the validity of websites
<b>SKILLS</b>	<b>NC subject content</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Year 6</b>
<b>Using technology safely and responsibly</b>  <b>See Education for a Connected World</b>	-Use technology safely, respectfully and responsibly; recognise, acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	<b>Autumn: I am kind and responsible</b> <ul style="list-style-type: none"> <li>• I support my friends to protect themselves and make good choices online, including reporting concerns to an adult</li> </ul>	<b>Autumn: I am kind and responsible</b> <ul style="list-style-type: none"> <li>• I use a range of strategies to protect myself and my friends from harm online, including reporting concerns to a trusted adult</li> </ul>	<b>Autumn: I am kind and responsible</b> <ul style="list-style-type: none"> <li>• I use a search engine to find and evaluate different types of information</li> <li>• I contribute to shared rules and use them to</li> </ul>	<b>Autumn: I am kind and responsible</b> <ul style="list-style-type: none"> <li>• I support my friends to protect themselves and make good choices online, including reporting concerns to an adult</li> </ul>

	<p>-Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</p>	<ul style="list-style-type: none"> <li>• I contribute to shared rules and use them to support myself and others when we use technology</li> <li>• I explain why lots of people sharing the same opinions or beliefs online does not make these opinions or beliefs true</li> <li>• I talk about the way search results are selected and ranked and check the reliability of websites I visit</li> <li>• I describe the ways that people get bullied when they use different technologies and consider what I post</li> <li>• I use search tools to find appropriate information and decide whether I can trust it</li> </ul> <p><b>Spring: I am safe</b></p> <ul style="list-style-type: none"> <li>• I use a secure password and explain why they are important</li> <li>• I protect my personal information when I do different things online</li> <li>• I participate safely and responsibly in a secure online community</li> </ul> <p><b>Summer: I am healthy</b></p> <ul style="list-style-type: none"> <li>• I identify images which have been digitally altered</li> <li>• I identify adverts online, including those within Google searches</li> <li>• I use age-appropriate apps, games and websites</li> </ul>	<ul style="list-style-type: none"> <li>• I identify key words to use when searching safely online and think about the reliability of information I find</li> </ul> <p><b>Spring: I am safe</b></p> <ul style="list-style-type: none"> <li>• I know that anything I share online will stay there to be seen and used by others</li> <li>• I make safe choices when using technology to communicate responsibly with others</li> <li>• I explain why I need to ask a trusted adult before downloading files and games from the internet</li> </ul> <p><b>Summer: I am healthy</b></p> <ul style="list-style-type: none"> <li>• I explain how digitally altered images in the media make me feel</li> <li>• I ignore or close adverts that appear on my device and explain my reasons</li> <li>• I choose apps, games and websites that are appropriate for my age and explain my reasons to my friends</li> <li>• I tell my friends about the sensible choices I make about when and why I use devices</li> </ul>	<p>support myself and others when we use technology</p> <ul style="list-style-type: none"> <li>• I always communicate kindly and respectfully and can describe the impact where this does not happen</li> <li>• I explain why I need to protect myself and my friends and the best ways to do this, including reporting concerns to a trusted adult</li> </ul> <p><b>Spring: I am safe</b></p> <ul style="list-style-type: none"> <li>• I explain the risks of sharing too much about myself online</li> <li>• I compare my online and face-to-face relationships</li> </ul> <p><b>Summer: I am healthy</b></p> <ul style="list-style-type: none"> <li>• I know the reasons why images are altered</li> <li>• I identify the intended audience for an advert</li> </ul>	<ul style="list-style-type: none"> <li>• I contribute to shared rules and use them to support myself and others when we use technology</li> <li>• I explain why lots of people sharing the same opinions or beliefs online does not make these opinions or beliefs true</li> <li>• I talk about the way search results are selected and ranked and check the reliability of websites I visit</li> <li>• I always communicate kindly and respectfully and work with others to help everyone enjoy their use of technology</li> </ul> <p><b>Spring: I am safe</b></p> <ul style="list-style-type: none"> <li>• I check the information about me online and know that some of it can be uploaded by others</li> <li>• I consider terms and conditions and adjust privacy settings to maintain control of my personal information</li> <li>• I explain how to communicate safely and responsibly with people I only know online</li> </ul> <p><b>Summer: I am healthy</b></p> <ul style="list-style-type: none"> <li>• I explain how images in the media affect how we feel about ourselves</li> <li>• I explain how my data is used to target adverts towards me</li> </ul>
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		<p>from a list I have agreed with others</p> <ul style="list-style-type: none"> <li>• I make good choices about when and why I use devices</li> </ul>			<ul style="list-style-type: none"> <li>• I support my friends in evaluating their use of games and devices and make good choices for myself</li> </ul>
<p><b>Understanding and using Multimedia</b></p> <p><b>Using and presenting information purposefully</b></p>	<p>-Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</p> <p>-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</p> <p>Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.</p> <p>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</p>	<p><b>Keyboard Skills</b></p> <ul style="list-style-type: none"> <li>• Typing</li> <li>• Full stops, commas</li> <li>• Capitals using caps lock and shift key</li> <li>• Backspace/delete</li> <li>• Undo/redo</li> <li>• Return key/new paragraph</li> </ul> <p><b>Text formatting</b></p> <ul style="list-style-type: none"> <li>• Bold, italic, underline</li> <li>• Text size, font, colour</li> <li>• Landscape and portrait</li> </ul> <p><b>Combining content</b></p> <ul style="list-style-type: none"> <li>• Copy, paste + short cuts</li> <li>• Zoom in/out</li> </ul> <p>Saving documents</p> <p><b>Intro to PowerPoint</b></p>	<p><b>Keyboard Skills</b></p> <ul style="list-style-type: none"> <li>• Practice of previous</li> <li>• Using shift key to access ?!"@£% etc</li> <li>• Using tab</li> <li>• Ctrl a to select all</li> <li>• Insert table</li> </ul> <p><b>Text formatting</b></p> <ul style="list-style-type: none"> <li>• Add image</li> <li>• Spell check</li> <li>• Bullet points and numbers</li> <li>• Highlight text</li> <li>• </li> </ul> <p><b>Combining content</b></p> <ul style="list-style-type: none"> <li>• Layer objects</li> <li>• Crop images</li> <li>• Transitions</li> </ul> <p>Saving on a usb key</p> <p><b>Poster in Power Point</b></p> <p><b>Video (Imovie)</b></p>	<p><b>Keyboard Skills</b></p> <ul style="list-style-type: none"> <li>• Using num lock</li> <li>• Ctrl f to find keyword</li> </ul> <p><b>Text formatting (Yr 5/6)</b></p> <ul style="list-style-type: none"> <li>• Indent text</li> <li>• Thesaurus</li> <li>• columns</li> </ul> <p><b>Combining content</b></p> <ul style="list-style-type: none"> <li>• Hyperlinking within a doc</li> <li>• Hyperlinking to websites</li> <li>• Embedding a video</li> <li>• Adding music to a pp</li> <li>• Adding voice over</li> <li>• <u>Snipping tool/print screen</u></li> </ul> <p>Multi-screen windows</p> <p><b>Green Screen</b></p> <p><b>Emails</b> (download and save files from an email, email more than one persona and reply to all)</p>	<p><b>Text formatting (Yr 5/6)</b></p> <ul style="list-style-type: none"> <li>• tables</li> </ul> <p><b>Combining content</b></p> <ul style="list-style-type: none"> <li>• Hyperlinking within a doc</li> <li>• Hyperlinking to websites</li> <li>• Embedding a video</li> <li>• Adding music to a pp</li> <li>• Adding voice over</li> </ul> <p>Snipping tool</p> <p><b>Stop Animation</b></p> <p><b>Blogging</b></p> <p><b>Acquire and store images from cameras or ipads</b></p>

<p><b>Understanding and using data</b></p>		<p><b>Handling Data 1 – Showing My Device Time</b></p> <ul style="list-style-type: none"> <li>• I can collect data to help me answer a question</li> <li>• I can talk about the different ways data can be organised</li> <li>• I can search a ready-made database to answer questions.</li> <li>• I can add to a database.</li> <li>• I can use a data logger to monitor changes and can talk about the information collected.</li> </ul>	<p><b>Handling Data 1 – Showing My Device Time</b></p> <ul style="list-style-type: none"> <li>• I can collect data to help me answer a question</li> <li>• I can talk about the different ways data can be organised</li> <li>• I can search a ready-made database to answer questions.</li> <li>• I can add to a database.</li> <li>• I can use a data logger to monitor changes and can talk about the information collected.</li> </ul>	<p>Create data collection forms and enter data accurately from these.</p> <p>Know how to check for and spot inaccurate data.</p> <p>Know which formulas to use when I want to change my spreadsheet model.</p> <p>Make graphs from the calculations on my spreadsheet.</p> <p>Sort and filter information.</p> <p>Understand that changing the numerical data effects a calculation.</p>	<p>Create data collection forms and enter data accurately from these.</p> <p>Know how to check for and spot inaccurate data.</p> <p>Know which formulas to use when I want to change my spreadsheet model.</p> <p>Make graphs from the calculations on my spreadsheet.</p> <p>Sort and filter information.</p> <p>Understand that changing the numerical data effects a calculation.</p>
<p><b>Programming</b></p>	<p>design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</p> <p>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</p> <p>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</p>	<p>Bee Bots – Mazes Scratch Jr App – <b>Programming 4 –Making my Moves</b></p> <p>I can tell you the order I need to do things to make something happen and talk about this as an algorithm.</p> <ul style="list-style-type: none"> <li>• I can program a robot or software to do a particular task.</li> <li>• I can look at my friend’s program and tell you what will happen.</li> <li>• I can use programming software to make objects move.</li> </ul>	<p>Scratch Jr App – <b>Programming 4 –Making my Moves</b></p> <p>I can tell you the order I need to do things to make something happen and talk about this as an algorithm.</p> <ul style="list-style-type: none"> <li>• I can program a robot or software to do a particular task.</li> <li>• I can look at my friend’s program and tell you what will happen.</li> <li>• I can use programming software to make objects move.</li> <li>• I can watch a program execute and spot where it</li> </ul>	<p>Scratch - <b>Programming 1 – Making my Program in Scratch</b></p> <p>I can break an open-ended problem up into smaller parts.</p> <ul style="list-style-type: none"> <li>• I can put programming commands into a sequence to achieve a specific outcome.</li> <li>• I can detect a problem in an algorithm which could result in unsuccessful programming.</li> <li>• I keep testing my program and can recognise when I need to debug it.</li> <li>• I can use repeat commands.</li> <li>• I can describe the algorithm I will need for a simple task.</li> </ul>	<p>Scratch - <b>Programming 1 – Making my Program in Scratch</b></p> <p>I can break an open-ended problem up into smaller parts.</p> <ul style="list-style-type: none"> <li>• I can put programming commands into a sequence to achieve a specific outcome.</li> <li>• I can detect a problem in an algorithm which could result in unsuccessful programming.</li> <li>• I keep testing my program and can recognise when I need to debug it.</li> <li>• I can use repeat commands.</li> <li>• I can describe the algorithm I will need for a simple task.</li> </ul>

		<ul style="list-style-type: none"> <li>• I can watch a program execute and spot where it goes wrong so that I can debug it.</li> </ul>	<p>goes wrong so that I can debug it.</p>	<p><b>Programming 1</b>  I know that I need to keep testing my program while I am putting it together.</p> <ul style="list-style-type: none"> <li>• I can use a variety of tools to create a program.</li> <li>• I can recognise an error in a program and debug it.</li> <li>• I can use an efficient procedure to simplify a program.</li> <li>• I can use logical thinking to solve a problem by breaking it up into smaller parts.</li> <li>• I can use a sensor to detect a change which can select an action in a program.</li> <li>• I can recognise that an algorithm will help me sequence more complex programs.</li> </ul>	<p><b>Programming 1</b>  I know that I need to keep testing my program while I am putting it together.</p> <ul style="list-style-type: none"> <li>• I can use a variety of tools to create a program.</li> <li>• I can recognise an error in a program and debug it.</li> <li>• I can use an efficient procedure to simplify a program.</li> <li>• I can use logical thinking to solve a problem by breaking it up into smaller parts.</li> <li>• I can use a sensor to detect a change which can select an action in a program.</li> <li>• I can recognise that an algorithm will help me sequence more complex programs.</li> </ul>
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