

# Progression for Computing

## **Purpose of Study:**

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.

## **Aims:**

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

- can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
- can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
- can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
- are responsible, competent, confident and creative users of information and communication technology.

## **Attainment Targets:**

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

<b>EYFS</b>	<b>Computer systems and networks</b>	<b>Creating Media</b>	<b>Programming and Algorithms</b>	<b>Data and information</b>
<p><b>Early Learning Goals:</b></p> <p><b>Personal, Social and Emotional Development:</b></p> <ul style="list-style-type: none"> <li>• Be confident to try new activities and show independence, resilience and perseverance in the face of challenge.</li> <li>• Explain the reasons for rules, know right from wrong and try to behave accordingly.</li> </ul> <p><b>Expressive Arts and Design:</b></p> <ul style="list-style-type: none"> <li>• Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.</li> </ul>	<p><b>Pre-school (3-4 year olds):</b></p> <ul style="list-style-type: none"> <li>• I can increasingly follow rules, understanding why they are important.</li> </ul>	<p><b>Pre-school (3-4 year olds):</b></p> <ul style="list-style-type: none"> <li>• Explore different technological tools.</li> </ul>	<p><b>Pre-school (3-4 year olds):</b></p> <ul style="list-style-type: none"> <li>• Explore technology, to understand how it works.</li> </ul>	<p><b>Pre-school (3-4 year olds):</b></p> <ul style="list-style-type: none"> <li>• I understand information can come from the internet.</li> <li>• I understand right and wrong when using technology.</li> </ul>
	<p><b>Reception:</b></p> <ul style="list-style-type: none"> <li>• Use different digital devices e.g. iPads, Bee-Bots.</li> <li>• I recognise a selection of digital devices.</li> <li>• I recognise the basic parts of a computer.</li> </ul>	<p><b>Reception:</b></p> <ul style="list-style-type: none"> <li>• I can use technology to explore and access digital content.</li> <li>• I can create simple digital content.</li> <li>•</li> </ul>	<p><b>Reception:</b></p> <ul style="list-style-type: none"> <li>• Explore technology.</li> <li>• Follow simple instructions to control a device.</li> <li>• Input a short sequence of instructions.</li> </ul>	<p><b>Reception:</b></p> <ul style="list-style-type: none"> <li>• I can access content in a range of formats.</li> </ul>

<p><b>Key Stage 1</b></p>	<p><b>Computer systems and networks</b></p>	<p><b>Creating Media</b></p>	<p><b>Programming and Algorithms</b></p>	<p><b>Data and information</b></p>
<p>Pupils should be taught:</p> <ul style="list-style-type: none"> <li>To understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.</li> <li>To create and debug simple programs.</li> </ul>	<p><b>Year 1:</b></p> <ul style="list-style-type: none"> <li>I recognise a range of digital devices.</li> <li>I can log on to the school computer using a username.</li> <li>I can select the correct device to fulfil a specific task.</li> </ul>	<p><b>Year 1:</b></p> <ul style="list-style-type: none"> <li>I can create digital content using specific programmes such as Paint and Word.</li> <li>I can save a file to store digital content with support.</li> <li>I can use a camera.</li> </ul>	<p><b>Year 1:</b></p> <ul style="list-style-type: none"> <li>I can create a series of instructions.</li> <li>I can plan a journey for a programmable toy.</li> <li>I can predict the outcome of a simple algorithm or program.</li> <li>I can debug an error in a simple algorithm or program.</li> </ul>	<p><b>Year 1:</b></p> <ul style="list-style-type: none"> <li>I recognise different forms of digital content.</li> <li>I collect simple data on a topic.</li> </ul>

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<ul style="list-style-type: none"> <li>• To use logical reasoning to predict the behaviour of simple programs.</li> <li>• To use technology purposefully to create, organise, store, manipulate and retrieve digital content.</li> <li>• To recognise common uses of information technology beyond school.</li> <li>• To use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet of other online technologies.</li> </ul>		<ul style="list-style-type: none"> <li>• I can record a sound and play it back.</li> </ul>		
	<p><b>Year 2:</b></p> <ul style="list-style-type: none"> <li>• I recognise that a computer has inputs and outputs.</li> <li>• I can identify and use input devices.</li> <li>• I can log on to a computer using a username and password.</li> <li>• I can open files from a given folder.</li> </ul>	<p><b>Year 2:</b></p> <ul style="list-style-type: none"> <li>• I can create simple digital content for a purpose, using specific programmes such as Paint and Word.</li> <li>• I can save a file to store digital content.</li> <li>• I can edit digital content to achieve a particular effect.</li> <li>• I recognise that we can use technology to</li> </ul>	<p><b>Year 2:</b></p> <ul style="list-style-type: none"> <li>• I can use a range of instructions (e.g. direction, angles, turns).</li> <li>• I can write a simple program and test it.</li> <li>• I can find errors and amend (Debug).</li> <li>• I understand that programmes require precise instructions.</li> <li>• I can predict what the outcome of a simple program will be (logical reasoning).</li> </ul>	<p><b>Year 2:</b></p> <ul style="list-style-type: none"> <li>• I recognise tally charts, charts, pictograms and branching databases and why we use them.</li> <li>• I collect data on a topic and present in a pictogram or chart.</li> </ul>

		record and playback audio.		
<p><b>Key Stage 2</b></p> <p>Pupils should be taught:</p> <ul style="list-style-type: none"> <li>To design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.</li> <li>Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.</li> <li>To use logical reasoning to explain how some</li> </ul>	<p><b>Computer systems and networks</b></p>	<p><b>Creating Media</b></p>	<p><b>Programming and Algorithms</b></p>	<p><b>Data and information</b></p>
	<p><b>Year 3:</b></p> <ul style="list-style-type: none"> <li>I can describe what computer inputs and outputs are.</li> <li>I can explain the difference between input and output devices on a computer.</li> <li>I am beginning to type quickly using a computer keyboard.</li> <li>I can use a search engine to find simple information.</li> <li>I understand that school computers are connected.</li> <li>I can add an image to a document from the internet.</li> </ul>	<p><b>Year 3:</b></p> <ul style="list-style-type: none"> <li>I know where to save and open files.</li> <li>I can present ideas and information by combining media.</li> <li>I can design and create simple digital content for a purpose/audience.</li> <li>I can edit digital content and explain how it has been edited.</li> </ul>	<p><b>Year 3:</b></p> <ul style="list-style-type: none"> <li>I can predict the outcome of a block based program.</li> <li>I can modify an existing program.</li> <li>I can identify repeated steps in a program or algorithm.</li> <li>I can use a count-controlled loop to make a program more efficient.</li> <li>I can use a forever loop in a program or algorithm.</li> </ul>	<p><b>Year 3:</b></p> <ul style="list-style-type: none"> <li>I can present information using a suitable chart.</li> <li>I can name the key parts of a database.</li> <li>I can find common attributes to create a branching database.</li> </ul>

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<p>simple algorithms work and to detect and correct errors in algorithms and programs.</p> <ul style="list-style-type: none"> <li>To understand compute 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.</li> <li>To use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.</li> <li>To 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</li> </ul>			<ul style="list-style-type: none"> <li>I can identify errors in a program or algorithm and debug them.</li> <li>I can identify different inputs that can be used to control a program.</li> </ul>	
	<p><b>Year 4:</b></p> <ul style="list-style-type: none"> <li>I can copy and paste text or images to a document.</li> <li>I can crop an image and apply simple filters.</li> <li>I can use a search engine to find specific information.</li> <li>I recognise that school computers are connected on a network.</li> <li>I can work with computer inputs and outputs.</li> <li>I can use a keyboard effectively to type text.</li> </ul>	<p><b>Year 4:</b></p> <ul style="list-style-type: none"> <li>I recognise that you can organise files using folders.</li> <li>I can collect, organise and present information using a range of media.</li> <li>I can design and create digital content for a specific purpose.</li> <li>I can edit digital content to improve it according to feedback.</li> </ul>	<p><b>Year 4:</b></p> <ul style="list-style-type: none"> <li>I can create a program that uses a range of inputs.</li> <li>I can decompose a problem into small parts to help solve it.</li> <li>I can explain when to use forever loops and count-controlled loops and use them in programs.</li> <li>I recognise selection in a program or algorithm.</li> <li>I can design a program for a purpose.</li> <li>I can debug a program and correct it.</li> </ul>	<p><b>Year 4:</b></p> <ul style="list-style-type: none"> <li>I can design a questionnaire and collect a range of data on a theme.</li> <li>I can choose appropriate formats to present data.</li> <li>I can use a computer program to sort data by common attributes.</li> </ul>
	<p><b>Year 5:</b></p> <ul style="list-style-type: none"> <li>I can type using fingers on both hands.</li> <li>I know how to mute and unmute audio on a computer or tablet.</li> </ul>	<p><b>Year 5:</b></p> <ul style="list-style-type: none"> <li>I can identify and use appropriate hardware and software for specific tasks.</li> </ul>	<p><b>Year 5:</b></p> <ul style="list-style-type: none"> <li>I can predict what will happen in a program or algorithm when the input changes.</li> </ul>	<p><b>Year 5:</b></p> <ul style="list-style-type: none"> <li>I can explain the difference between data and information.</li> <li>I appreciate that different programs work</li> </ul>

<p>presenting data and information.</p> <ul style="list-style-type: none"> <li>To use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li> </ul>	<ul style="list-style-type: none"> <li>I recognise that there is more than one search engine, and they may produce different results.</li> <li>I can use a search engine effectively to find information and images.</li> <li>I can search for an application on a computer/tablet.</li> <li>I can describe a computer network.</li> </ul>	<ul style="list-style-type: none"> <li>I consider the audience when designing and creating digital content.</li> <li>I can evaluate my own designs, suggesting improvements.</li> </ul>	<ul style="list-style-type: none"> <li>I can use two-way selection in programs and algorithms.</li> <li>I recognise variables in a program and what they do.</li> <li>I can create and use simple variables.</li> <li>I can evaluate a program and make improvements to the code or design.</li> </ul>	<p>with different types of data.</p> <ul style="list-style-type: none"> <li>I know the difference between the Internet and the World Wide Web.</li> <li>I can use and create branching databases.</li> </ul>
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## Online Safety – Education for a Connected World Objectives

All the statements from this document have been taken from the Education for a Connected World Document. In KS1, the objectives are explicitly taught on a 2-year cycle, whilst in KS2 this is a 3-year cycle. Gaps in online safety knowledge are assessed regularly throughout the

year and children are taught this knowledge through our Wise-Up Wednesday sessions each week, in addition to the dedicated E-Safety lessons.

	Self-Image and Identity	Online Relationships	Online Reputation	Online Bullying	Managing Online Information	Health, Well-being and Lifestyle	Privacy and Security	Copyright and Ownership
<b>EYFS</b>	I can recognise, online or offline, that anyone can say ‘n’ – ‘please stop’ – ‘I’ll tell’ – ‘I’ll ask’ to somebody who makes them feel sad, uncomfortable, embarrassed, or upset.	I can recognise some ways in which the internet can be used to communicate.	I can identify ways that I can put information on the internet.	I can describe ways that some people can be unkind online.	I can identify devices I could use to access information on the internet.	I can identify rules that help keep us safe and healthy in and beyond the home when using technology.	I can identify some simple examples of my personal information (e.g. name, address, birthday, age, location).	I know that work I create belongs to me.
<b>Y1</b>	I can recognise that there may be people online who could make someone feel sad, embarrassed or upset.	I can explain why things one person finds funny or sad online may not always be seen in the same way by others.	I can recognise that information can stay online and could be copied.	I can describe how to behave online in ways that do not upset others and can give examples.	I know/understand that we can encounter a range of things online including things we like and don’t like as well as things which are real or make believe/ a joke.	I can explain rules to keep myself safe when using technology both in and beyond the home.	I can explain that passwords are used to protect information, accounts and devices.	I can explain why work I create using technology belongs to me.
<b>Y2</b>	I can explain how other people may	I can explain how it may make	I can explain how information put	I can explain why anyone who	I can demonstrate how to navigate a	I can explain simple guidance	I can describe and explain	I can describe why other



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	look and act differently online and offline.	others feel if I do not ask their permission or ignore their answer before sharing something about them online.	online about someone can last for a long time.	experiences bullying is not to blame.	simple webpage to get to information I need (e.g. home, forward, back buttons; links, tabs and sections).	for using technology in different environments and settings e.g. accessing online technologies in public places and the home environment.	some rules for keeping personal information private (e.g. creating and protecting passwords).	people's work belongs to them.
<b>Y3</b>	I can explain ways in which someone might change their identity depending on what they are doing online (e.g., gaming, using an avatar, social media) and why.	I can explain the importance of giving and gaining permission before sharing things online; how the principles of sharing online is the same as sharing offline e.g. sharing images and videos.  I can explain what it means to 'know someone' online and why this might be different from	I can explain how to search for information about others online.  I can give examples of what anyone may or may not be willing to share about themselves online. I can explain the need to be careful before sharing anything personal.	I can give examples of how bullying behaviour could appear online and how someone can get support.	I can explain the difference between a 'belief', an 'opinion' and a 'fact' and can give examples of how and where they might be shared online, e.g. in videos, memes, posts, news, stories etc.	I can explain why spending too much time using technology can sometimes have a negative impact on anyone; I can give some examples of both positive and negative activities where it is easy to spend a lot of time engaged.  I can explain why some online activities have age restrictions, why it is important to follow them and	I can describe simple strategies for creating and keeping passwords.  I can give reasons why someone should only share information with people they choose to and can trust. I can explain that if they are not sure or feel pressured they should tell a trusted adult.	I can explain why copying someone else's work from the internet without permission isn't fair and can explain what problems this might cause.

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		knowing someone offline.				know who I can talk to if others pressure me to watch or do something online that makes me feel uncomfortable (e.g. age restricted gaming or websites).		
<b>Y4</b>	I can explain that others online can pretend to be someone else, including my friends, and can suggest reasons why they might do this.	I can explain how content shared online may feel unimportant to one person but may be important to other people's thoughts, feelings and beliefs.  I can give examples of how to be respectful to others online and describe how to recognise healthy and unhealthy online behaviours.	I can explain ways that some of the information about anyone online could have been created, copied or shared by others.  I can describe how to find out information about others by searching online.	I can recognise when someone is upset, hurt or angry online.	I can describe some of the methods used to encourage people to buy things online (e.g. advertising offers; in-app purchases, pop-ups) and can recognise some of these when they appear online.	I can explain how using technology can be a distraction from other things, in both a positive and negative way.  I can identify times or situations when someone may need to limit the amount of time they use technology e.g. I can suggest strategies to help with limiting this time.	I can explain that internet use is never fully private and is monitored, e.g. adult supervision.  I know what the digital age of consent is and the impact this has on online service asking for consent.	I can give some simple examples of content which I must not use without permission from the owner, e.g. videos, music, images.

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<p><b>Y5</b></p>	<p>I can demonstrate how to make responsible choices about having an online identity, depending on context.</p>	<p>I can 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.</p> <p>I can explain how someone can get help if they are having problems and identify when to tell a trusted adult.</p>	<p>I can search for information about an individual online and summarise the information found.</p> <p>I can describe ways that information about anyone online can be used by others to make judgements about an individual and why these may be incorrect.</p>	<p>I can identify a range of ways to report concerns and access support both in school and at home about online bullying.</p>	<p>I can explain what is meant by a 'hoax'. I can explain why someone would need to think carefully before they share.</p>	<p>I can recognise the benefits and risk of accessing information about health and well-being online and how we should balance this with talking to trusted adults and professionals.</p> <p>I can describe ways technology can affect health and well-being both positively (e.g. mindfulness apps) and negatively.</p>	<p>I can explain how many free apps or services may read and share private information (e.g. friends, contacts, likes, images, videos, voice, messages, geolocations) with others.</p> <p>I can explain what app permissions are and can give some examples.</p>	<p>I can assess and justify when it is acceptable to use the work of others.</p>
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