

Cambridgeshire Progression in Computing Capability

Understanding technology:

Purpose of study ~ Computing programmes of study: Key stages 1 and 2

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.

Theme Overview: Understanding Technology

Children's natural curiosity has always driven them to develop an understanding of the world around them and this is no different when it comes to understanding technology; both how it works and what it can do for us. From their first, early experiences with technology, pupils begin to make sense of how it works and the opportunities it can provide. Throughout their time in primary education, pupils now need to extend that understanding to include computer networks such as the Internet, and the services they can provide such as the World Wide Web. Teachers need to provide practical, fun experiences that allow pupils to make links with their existing understanding of the world around them. In doing so, pupils will ultimately become much more effective creators and users of digital content.

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	Early Capability		Middle Capability		Later Capability	
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
National Curriculum	<ul style="list-style-type: none"> Recognise common uses of information technology beyond school 		<ul style="list-style-type: none"> 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 			
Cambridgeshire Capability Statements	<p><i>Pupils recognise and can give examples of common uses of information technology they encounter in their daily routine.</i></p>	<p>Pupils recognise common uses of information technology beyond school, including those which they don't frequently encounter in their daily routine.</p> <p>Pupils understand that computers are not intelligent but can appear to be when following algorithms. They can share examples of this.</p>	<p>Pupils develop an understanding of how computers can be linked to form a local network such as those found in schools.</p> <p>Pupils recognise and describe some of the services offered by the Internet, especially those used for communication and collaboration.</p> <p>Pupils understand the role of web browsers when viewing web pages and can explain how individual web pages can be found (either from searches or from individual, unique addresses).</p> <p>Pupils understand that computers (in various forms) generally accept inputs and produce outputs and can give examples of this.</p>	<p>Pupils understand and can explain how computer networks work, and know that the Internet is a collection of computers connected together.</p> <p>They recognise that there is a difference between the Internet and the World Wide Web and know that the web is just one of the services offered by the Internet (as well as, e.g. email and VoIP services such as Skype)</p> <p>Pupils appreciate how search results are ranked, including an understanding of the role of 'relevance' and 'importance' in finding and presenting results.</p>		

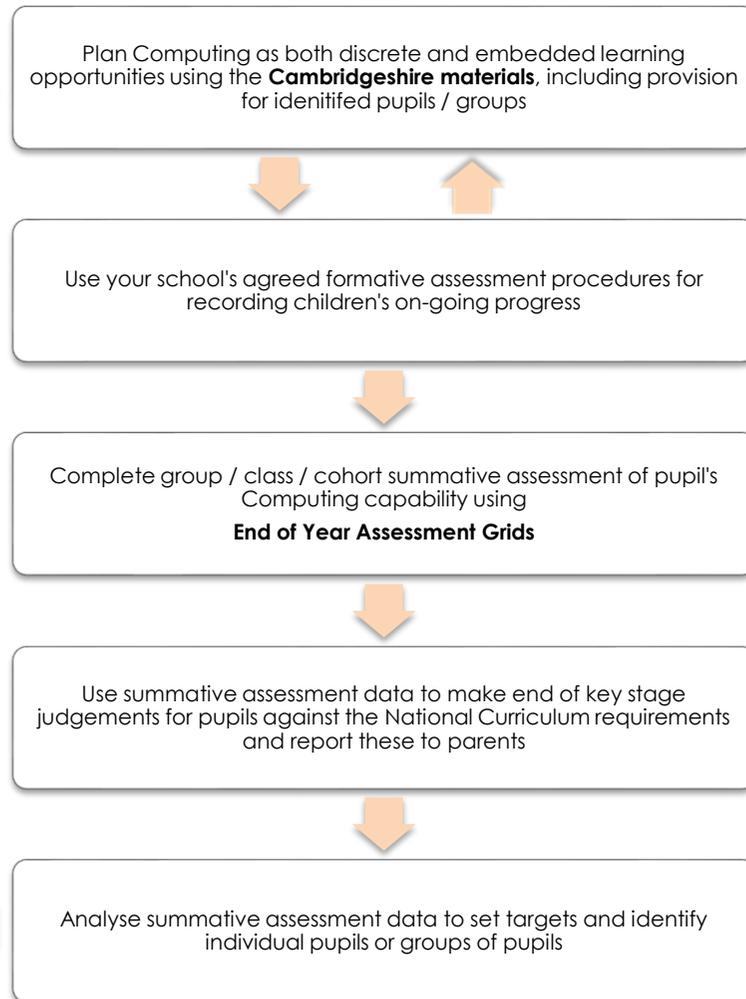
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Resource Description	<p>Many of the activities involved in 'Understanding Technology' will be unplugged and so the range of digital resources needed will be minimal. However, there are an increasing range of online resources available for supporting teaching and sharing ideas. These include:</p> <ul style="list-style-type: none"> ▪ BBC Bitesize Computing (KS1) ▪ Code-it.co.uk – CS planning ▪ Simon Haughton's Website – Finding out about technology beyond school ▪ Barefoot Computing, for pupil activities and for raising staff subject knowledge 		<p>Many of the activities involved in 'Understanding Technology' will be unplugged and so the range of digital resources needed will be minimal. However, there are an increasing range of online resources available for supporting teaching and sharing ideas. These include:</p> <ul style="list-style-type: none"> ▪ Computer Science Unplugged ▪ BBC Bitesize Computing (KS2) ▪ Barefoot Computing, for pupil activities and for raising staff subject knowledge ▪ London Grid for Learning's National History of Computing ▪ Code-it.co.uk – CS planning ▪ Computer Science for Fun 			
Example Activities (Plugged / unplugged)	<p>Complete a school trail (in groups) identifying how technology is used around them. Talk to different school adults (e.g. office, kitchen etc) to find out how technology is used to help solve problems in their daily lives (See activity card)</p> <p>Consider activities such as: How supermarkets work, How a library works (code-it.co.uk)</p>	<p>Incorporate questions about the use of technology when external visitors come to the school. How do different occupations make use of technology? How is technology used to solve problems in parents' occupations? What about during school visits. Raise pupils' awareness of technology in the world around them. Consider activities such as: How a bank works (Code it.co.uk) and How Computers have Changed over Time (BBC Bitesize).</p>	<p>KS2 Network Hunt (Barefoot - unplugged). Compare to other examples of 'networks' such as roads and paths.</p> <p>Combine BBC Bitesize – Controlling Physical Systems and this 'Internet of Things' activity card to explore the impact of internet connected devices on our lives now and potentially in the future.</p> <p>Link to programming work on inputs and outputs.</p>	<p>Ensure pupils understand that there is a difference between the Internet and the World Wide Web using resources such as this BBC Bitesize video and explore how search engines work.</p> <p>Explore the internet services children use so they realise the range of services the internet helps to provide. Explore what happens when you send an email.</p>	<p>Explore in more detail how networks work to efficiently solve problems such as comparing and sorting data.</p> <p>Think about observing or exploring Sorting Algorithms before moving onto simulating this kind of process with Sorting Networks e.g. See this in action at The Vine Primary School</p> <p>Deepen children's understanding of The Difference Between the Internet and the Web (Computing at School). Activities like this may need breaking down into several smaller lessons, depending on pupils' prior experiences.</p>	<p>Deepen pupils' understanding of how search engines work (BBC Bitesize), how results are selected (Barefoot) how results are ranked (Barefoot).</p> <p>Through a selection of unplugged activities, develop children's understanding of networks using examples such as this activity card or Modelling the Internet (Barefoot).</p>

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In September 2012, the DfE disapplied the 'Programmes of Study, associated attainment targets and statutory assessment arrangements for ICT'. Cambridgeshire suggests the following approach to assessing Computing capability and we will continue to update our guidance as further information is available nationally.

The Assessment Process:



The DfE document '**Primary assessment and accountability under the new national curriculum**' (July 2013) clearly states that 'schools will be able to introduce their own approaches to formative assessment'. Whichever approach schools choose to adopt, appropriate, targeted questioning should continue to form an essential part of the assessment process in helping pupils to articulate their learning. The following sample questions and statements are designed to support teachers in using effective, open ended questions to collect evidence about what their pupils have learned.

