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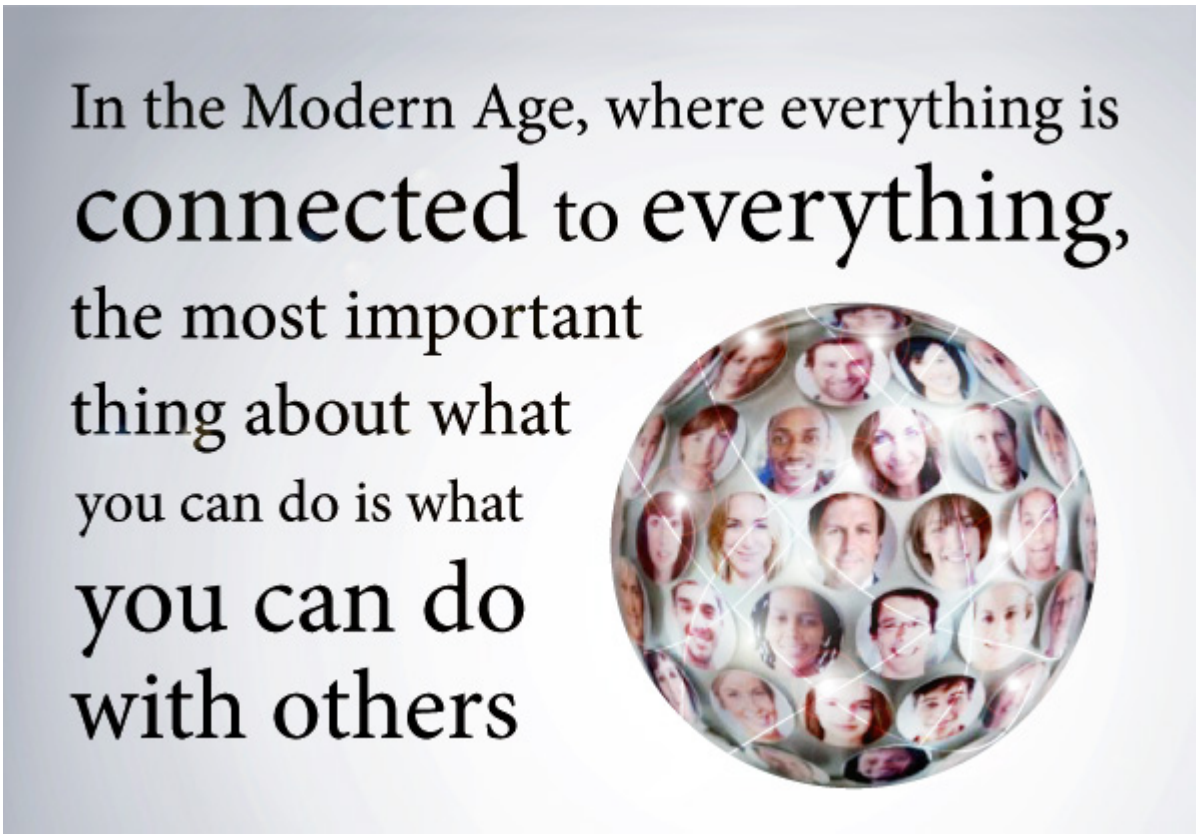
Computing Subject Leaders Resource File



Computing SL Resource File

This, and subsequent resource files have been designed specifically to support the work of subject leaders in Primary Schools who have responsibility for any of the following subjects: Art & Design; Computing; Design & Technology; English; Geography; History; Mathematics; MfL; Music; PE; PSHE and Science. The structure of each resource file follows the same format:

To support the work of a subject leader, there is a subject specific work-book for you to keep a record the impact / outcome of actions taken.

Computing Subject Leaders Work Book

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Part A: Resources & NC Requirements

Links

- The Educational Technology Association

https://www.naace.co.uk/
Membership: £75 / year for upto 3 members of a school's staff

- Computing at School

https://www.computingatschool.org.uk/

Resources

- Computing Leaders Toolkit (2Simple)
- Computing in the national curriculum: A guide for primary teachers (NAACE)
- Primary computing resources (STEM. ORG)
- Quick Start Computing: A CPD toolkit for primary teachers (DfE / Microsoft)

Through teaching Computing to pupils, we are enabling them to participate in a rapidly-changing world where work and leisure activities are being constantly transformed by technology.

Pupils will learn to find, explore, analyse, exchange and present information in a variety of changing ways. They will develop the skills necessary to be able to use information in a non-discriminating and effective way.

Computing skills are a major factor in enabling pupils to become confident, creative and independent learners. It is our intention that they will have every opportunity available to achieve this.

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Computing programmes of study: key stages 1 and 2

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/239033/PRIMARY_national_curriculum_-_Computing.pdf

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.

Subject content

Key stage 1

Pupils should be taught to:

♣ understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions

♣ create and debug simple programs

♣ use logical reasoning to predict the behaviour of simple programs

♣ use technology purposefully to create, organise, store, manipulate and retrieve digital content

♣ recognise common uses of information technology beyond school

♣ 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 or other online technologies.

Key stage 2

Pupils should be taught to:

♣ 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.

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Part B: Subject leaders audit: Computing

Task	Notes	Completed	Date
Am I clear about the N.C. Aims for COMPUTING?			
Have I checked out the subject association website to identify resources for: * Me, as the subject leader * Teachers / assistants			
Have I completed an audit of my own K, S & U against these aims?			
Have I identified sources to support me in my own subject knowledge?			
Have I written a statement of Intent for COMPUTING?			
In writing the statement of Intent, did I refer to paragraph 179 of D-D Resource 1?			
Re: Para: 179, do I have a written response for each of the 5 bullet points?			
Has this statement been approved by HT / SLT / all staff?			
Have I developed a monitoring calendar so that I am able to build up an accurate and up-to-date overview of the www/ebi in T, L & A for Computing?			
Have I clarified with my line manager what good / better T, L & A in Computing 'looks' like? (and hence what is not yet 'good' enough)			
Supplementary questions:			
How long have I been the subject leader for Computing, and what			

support (CPD) have I received either internally or externally?			
What resources do I use to support me as a subject leader?			
How have I designed the Computing curriculum?			
What am I trying to achieve through the Computing curriculum?			
What scheme of learning does the school follow (published or your own)?			
How is this subject taught, and why?			
How do children progress in this subject from one year to the next? *(Remember that **progress is knowing more, remembering more and being able to do more**.)*			
How do you ensure that pupils retain their subject knowledge?			
How do you ensure that pupils with SEND (as well as those entitled to Pupil Premium) benefit from the curriculum in Computing?			
What would you expect an inspector to see when they visit Computing lessons and speak to the pupils?			
How do teachers clarify any misconceptions by pupils?			
What links are made between Computing and other subjects does – can you give an example of where this works particularly well?			
Can you tell of any examples where you have supported other teachers / assistants in subject X and the impact that this has had on their teaching / pupils' learning?			

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Part C: Progression in Computing: exemplar

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 **(CS)**

♣ can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems **(CS)**

♣ can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems **(IT)**

♣ are responsible, competent, confident and creative users of information and communication technology. **(DL)**

	CS	IT	DL
	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.**
EYFS			
a	Pupils navigate on-screen resources to explore and locate information.	They work with text, images and sound to explore and share their ideas.	They use ICT safely by following instructions. They talk about their use of ICT.

	They investigate imaginary and virtual worlds and explore options. They explore how devices respond to commands.	They capture information and share their work with others. They understand that work can be saved and retrieved for later use.	
b	They plan and give instructions to make things happen or to control devices and describe the effects. They make informed choices when using ICT to explore what happens in real and imaginary situations.	Pupils find and use information to answer questions. They sort and organise information and present it in different forms. They use simple editing and formatting techniques to develop their work.	They describe how they use ICT to develop their work. They use ICT to communicate with others following instructions on safe use.
c	Pupils search for and use information from a range of sources and make judgements about its usefulness when following straightforward lines of enquiry. They use sequences of instructions to control devices and achieve specific outcomes. They answer questions when using ICT models and simulations.	They collect, record and organise data to answer questions and present findings. They use editing and formatting techniques to develop and refine their work to improve its quality and presentation.	They describe their use of ICT inside and outside school. They use communication tools to share and exchange their ideas with others, and follow strategies for staying safe.
d	Pupils refine searches to find, select and use information, questioning its reliability. Pupils understand the need for collecting information in a format that is suitable for processing.	They interpret their findings, question plausibility and recognise that poor-quality information leads to unreliable results. They capture data using sensors to support investigations.	They understand the benefits of online communication and can manage some of the risks associated with the digital environment. They compare their use of ICT with other methods and with its use outside school. They

	They develop simple ICT- based models to explore patterns and relationships, and make predictions about the consequences of their decisions. They plan, test and refine sequences of instructions.	They create and combine different forms of information, refining and presenting it for a particular purpose, showing an awareness of audience and the need for quality.	communicate and exchange information and ideas with others, collaborating to develop and improve work.
e	Pupils combine ICT tools within the overall structure of an ICT solution. They create sequences of instructions and understand the need to be precise when framing and sequencing instructions. They are systematic in changing the variables in an ICT-based model and explain the impact of the changes. They use ICT to organise, store and retrieve information using logical and appropriate structures.	They use ICT to structure, refine and present information in different forms and styles for specific purposes and audiences. They select the information they need for different purposes, check its accuracy and organise it in a form suitable for processing.	They use ICT safely and responsibly. They discuss their knowledge and experience of using ICT and their observations of its use outside school. They assess the use of ICT in their work and are able to reflect critically in order to make improvements in subsequent work. They use appropriate evaluation criteria to critically evaluate the fitness for purpose of their work a sit progresses. They exchange information and ideas with others in a variety of ways, including using digital communications.

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Part D: Initial subject self-evaluation proforma Date:

This is a basic self-evaluation proforma in order for the subject leader to gain a brief overview of strengths and areas for improvement possibly prior to undertaking a more comprehensive review and monitoring process.

Summary:
The key strengths in:
Teaching, learning & assessment in ICT / Computing are:
The ICT / Computing Curriculum are:
The main areas we need to develop in:
Teaching, learning & assessment in ICT / Computing are:
The ICT / Computing Curriculum are:

Signed: …….. **Date:** …….

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Part Ei: Best practice as identified by Ofsted

In this section, I make reference to:

- the last 'triennial' report the Ofsted (2013) wrote about Computing in Primary & Secondary schools *(Ofsted state that they are in the process of producing similar reports).* This report provides numerous examples of what were described as best practice in teaching & learning in Computing in primary schools. They provide excellent examples for sharing out amongst class teachers as well as for subject leaders to audit their school's provision against.

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/181223/110134.pdf

The last time Ofsted reported specifically on Computing (ICT) (2011)[1], they stated that:
Schools should:

- improve the use of assessment of pupils' progress in ICT, ensuring that pupils know how well they are doing and what they should do to move on to the next level
- ensure that pupils receive their complete entitlement to all areas of the ICT curriculum and that the ICT curriculum is engaging and relevant to pupils' needs within and beyond the classroom
- provide subject-specific support and professional development to improve teachers' confidence and expertise, enabling them to teach ICT more effectively
- evaluate the costs and benefits of establishing collaborative specialist services for ICT commissioning and procurement
- continue to make e-safety a priority in the curriculum, in staff training and in support for parents.

When the teaching was good or outstanding:

- well-judged pace was sustained throughout the lesson, with effective strategies for maintaining all pupils' engagement at a high level, even through periods of time when data needed to be uploaded or equipment had to be changed
- teachers had excellent subject knowledge and teaching assistants were well informed and briefed
- consistent attention was paid to reinforcing pupils' understanding and their use of key words ICT in schools
- planning was thorough and detailed, with particular attention to meeting the different requirements of individual pupils
- clear and explicit learning objectives were proposed and then discussed with pupils and displayed throughout the lesson

[1] ICT in schools 2008–11 (2011)

- safe working was emphasised at all times and with all resources
- a range of equipment and resources was available wherever pupils were learning, including laptops, cameras, recorders and alternative operating systems
- excellent use was made of interactive whiteboards to recap and review in a fast-paced manner, and to introduce new learning in a highly motivating, stimulating format
- opportunities were available for pupils to experience 'real world' ICT use outside school
- teachers encouraged pupils to be independent and to make sensible choices about appropriate equipment and materials for their task
- questions were used skilfully to challenge and extend learning
- formative assessment, through a variety of means, was an integral part of each lesson and self- and peer-assessment were actively promoted
- explicit links were made with key learning points in other subjects and most especially in literacy and numeracy.

A: **The example below illustrates a number of these strong features**.

In a good Year 3 lesson pupils learned to sort and search and to develop data-handling skills. At the start of the lesson the class teacher put on a police officer's helmet and role-played a police officer, with the pupils playing a group of new police recruits. The pupils were asked to solve the mystery of the sweet shop robbery. After reading to the class the story of the robbery, she encouraged them to reflect on what analytical and ICT skills would help them solve the crime. Pupils input key statements from witnesses about the appearance of suspects. They worked in pairs using key words to refine their search. The lesson captivated the pupils' imagination and interest and enabled them to develop improved data handling by applying search and sort skills to identifying the criminal. They also learned the importance of systematic collection and storage of information for problem-solving.
In Key Stages 1 and 2 most of the pupils seen developed effective skills in the use of ICT to communicate knowledge and ideas. Some of this work was relatively sophisticated, as the following examples illustrate.

This small primary school in an urban area of high social deprivation, facing a particular challenge to improve pupils' literacy skills, used ICT to enrich learning. Within a cross-curricular topic about 'community', pupils in a mixed-age Year 4/5 class interviewed a paramedic who worked in their local community. They recorded the interview with a digital camera and took written notes on the answers to their questions. In the school's ICT suite, questions were then word-processed and small groups of pupils, acting the role of reporter and interviewee, digitally recorded their versions of the interview. They used software to edit their sound recordings which were then made into podcasts ready to upload to the 'news' section on the school website. This innovative approach gave them both an insight into their community and a real reason for writing, discussing and editing their work. As well as improving their literacy skills and helping them appreciate how material has to be refined and written for an audience, this successfully enabled them to develop new collaborative skills in ICT through making and editing their recording.

In an excellent lesson in Year 4, pupils were learning how to produce a podcast. They worked in pairs, with one pupil acting as a reporter and the other as 'an animal that was being interviewed'. Pupils had planned their questions and answers from the work about habitats in science. They learnt how to layer and modify sounds and how to add sound effects. The lesson helped pupils to develop their ICT skills, while consolidating their learning in science. The lesson

also supported the development of pupils' writing, speaking and listening skills. All the work was undertaken with great enthusiasm.

Building on work in Key Stage 1, Year 6 pupils used software to construct and test their own flow diagrams using standard syntax.

The pupils, in pairs, were given data loggers for use in their science lesson. The teacher demonstrated their use, and one pupil then showed the class how they could annotate the graph they had produced. The pupils practised recording the varying light levels in various parts of the room with the data loggers. They then had to make a prediction about which material would make the best blackout blind. This linked to the work they had done in history about the Second World War. The pupils went on to use the data loggers to test a range of materials and decide what combinations of fabric would make the best curtains. Finally, in an effective plenary session the pupils considered the relative merits of the use of manual light sensors as opposed to data loggers.

The use of ICT in music is illustrated in the example below.

A Key Stage 1 pupil on the autism spectrum had very poor concentration and usually required continuous support from the teaching assistant. However, in the ICT lesson he became quickly absorbed in the task of manipulating a music program to make simple beats and rhythms. He made the same progress as other pupils in opening and saving files and was delighted with his results in combining the sounds of clapping, drums, cymbals and triangle.

An example of good practice with the more able pupils were observed in the good and outstanding schools visited, as illustrated in the example below. In this school, with good ICT provision, gifted and talented pupils set up and ran a newspaper.

They produced a questionnaire for initial market research, analysed the findings on a spreadsheet, raised the money, and developed costings and profit targets. They then produced the paper ICT in schools using a publishing package and reviewed and made improvements to the second edition. The wider learning gains in project management, interpersonal skills, running meetings, and negotiation were all of value in addition to the ICT skills developed.

The use of good-quality resources and the motivation engendered are illustrated in this Year 6 class.

Two pupils who attended gifted and talented provision at their local secondary school were introduced to a freeware application (Scratch) which enabled them to design and program a two-dimensional computer game. Their enthusiasm on returning to their primary school prompted their teacher to download the software and to introduce a new unit of work based around it. Pupils were asked to design the graphics, layout and functionality of their own computer game and to subsequently write the program to implement their ideas. Over a series of lessons, pupils used a paint application to design their game backgrounds and moveable icons. Having completed the graphical elements of their game they wrote scripts to control the movement and interaction. This required them to utilise sophisticated programming constructs such as 'repeat until' and 'if then' in capturing keyboard input and managing variables. The choice of task and software motivated pupils who were enabled to make good progress. Most were able to write a series of executable instructions to implement the features of their game design. One autistic pupil excelled at this task and made better progress than his peers. He

made outstanding use of loops, conditional jumps and incremental counters in his program. His skills exceeded those of his teacher, to whom he had to explain the principles of what he had done.

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Part: Eii Ofsted: Computing research report (May 2022)

https://www.gov.uk/government/publications/research-review-series-computing/research-review-series-computing

Introduction

Digital technology is driving extraordinary global changes that some are calling the Fourth Industrial Revolution. Navigating these changes effectively and safely requires a significant understanding of digital literacy, information technology and computer science. This knowledge is also crucial if business, industry and individuals are to exploit the opportunities offered by this revolution. The national curriculum makes it clear that computing is mandatory at key stages 1 to 4 and that 'a high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world'.

This review explores the literature relating to the field of computing education. Its purpose is to identify factors that can contribute to high-quality school computing curriculums, assessment, pedagogy and systems. We will use this understanding of subject quality to examine how computing is taught in England's schools. We will then publish a subject report to share what we have learned.

The purpose of this research review is set out more fully in the 'Principles behind Ofsted's research reviews and subject reports'.

Since there are a variety of ways that schools can construct and teach a high-quality computing curriculum, it is important to recognise that there is no single way of achieving high-quality computing education.
In this review, we have:

- outlined the national context in relation to computing
- summarised our review of research into factors that can affect the quality of education in computing
- considered curriculum progression in computing, pedagogy and assessment, and the impact of school leaders' decisions on provision

The review draws on a range of sources, including our 'Education inspection framework: overview of research', which sets out the 3 phases of our curriculum research. We hope that, through this work, we will contribute to raising the quality of computing education for all young people.

Reception and primary
Pupils' development of early computing knowledge is important. Grover, Pea and Cooper have suggested that:
"Learners' success in future engagement with computing will depend on how well introductory curricula prepare them in both the cognitive and affective dimensions of computational learning."

Computing is not part of the latest statutory framework for the early years foundation stage, but is part of the national curriculum from Year 1. Recently, there has been a debate on learning computing in the first years of schooling and the importance of getting it right. Several studies have demonstrated that young pupils are able to wrestle successfully with the core concepts of computing, including more technical subject content such as programming and robotics. That said, it is important that children experience teaching informed by expertise.

The national curriculum sets out the content that primary school pupils should learn in computing. A2017 report by the Royal Society identified that primary-age pupils typically have 1 hour a week of computing education; however, the research informing the report noted that this varies and there are a small number of primary schools where pupils receive no computing education at all. Three years after the new programmes of study for computing were introduced, the same research found that teachers saw computing as the 'future' and felt that there was a clear rationale for teaching the knowledge and skills required. Alongside these positive aspects it also found that Primary school teachers unfavourable to the new curriculum described the requirements as being too advanced for the available physical resources and budget, that staff lack the required skill-set and knowledge to teach the subject, and that the language used in the curriculum is overly-technical.

The research also highlighted that the main obstacle to teaching computing faced by teachers was a lack of technical subject knowledge. An international study from 2019 found that many primary school teachers were concerned about their own personal subject knowledge and the resources available to teach the intended curriculum.

Curriculum

Based on the above, high-quality computing education may have the following features:

- The planned curriculum includes a breadth of knowledge relating to computer science, information technology and digital literacy.
- Declarative knowledge ('knowing that') and procedural knowledge ('knowing how') are identified, sequenced and connected in the curriculum.
- Skilful use of technology is underpinned by procedural and declarative knowledge.

Computer science

Based on the above, high-quality computing education may have the following features:

- The curriculum is rich in computer science knowledge, enabling pupils to make sense of the entire computing curriculum.
- Pupils learn important programming knowledge to enable them to become skilful programmers.
- The curriculum sets out the knowledge pupils need to build a mental model of program execution.
- Programming languages are chosen to meet curriculum goals.
- Development of CT and problem-solving is underpinned by domain-specific knowledge that is identified and sequenced in the curriculum.

Information technology

Based on the above, high-quality computing education may have the following features:

- The curriculum to teach pupils how to create digital artefacts is underpinned by specified declarative and procedural knowledge.
- Pupils' schemata of computing contexts is built through new and repeated encounters with contexts to build a breadth and depth of knowledge.

Digital literacy

Based on the above, high-quality computing education may have the following features:

- Teachers should not make assumptions about pupils' prior knowledge within digital literacy.
- Knowledge and skills are clearly identified to teach pupils how to use computing devices.
- The curriculum carefully sequences knowledge related to e-safety to ensure that subject content is appropriate for pupils at each stage of their education.

Curriculum sequencing

Based on the above, high quality computing education may have the following features:

- Facts and essential concepts are sequenced to enable pupils to develop expertise within the subject.
- Component declarative and procedural knowledge are identified and sequenced to enable pupils to be successful in learning complex ideas or processes.
- Decisions to teach the subject in a discrete or cross-curricular way are based on how best to teach the intended curriculum.

Pedagogy

Based on the above, high-quality computing education may have the following features:

- Teachers consider pupils' expertise and prior knowledge when selecting teaching approaches, with novices requiring more explicit instruction.
- The choice of teaching activities is strongly linked to the intended subject content and helps achieve curriculum goals.
- Teachers use worked examples appropriately to help pupils solve problems.
- Textbooks are used as a resource to support teaching in computing.

Assessment

Based on the above, high-quality computing education may have the following features:

- Assessment focuses on the knowledge and skills identified in the curriculum and not generic competencies.
- Formative assessment is used to identify misconceptions early.

Systems

Based on the above, high-quality computing education may have the following features:

- Teachers have access to high-quality computing CPD to develop and maintain their subject knowledge.
- Leaders and teachers use the expertise of subject communities to develop teachers' subject knowledge.
- Adequate curriculum time is allocated to computing.
- Stakeholders work together to ensure that risks are weighed up and do not limit the ambition of the computing curriculum.

Conclusion

This review has explored a range of evidence relating to high-quality computing education. It has drawn on research from many different countries and organisations. It also builds from the same research base that underpins the EIF.

Computing education is important for pupils to make sense of and to contribute positively to our technologically diverse world. This review has highlighted approaches to constructing, sequencing and teaching a coherent computing curriculum rich in computer science, information technology and digital literacy to achieve this aim and the aims set out in the national curriculum. Central to this is the importance of identifying and ordering the underlying knowledge that pupils require to make sense of complex ideas or engage in composite tasks or activities within the subject. Computing is rich in these ideas and tasks, so this is essential. To ensure that pupils can make progress through the curriculum, it is important that teachers check this knowledge so that pupils are ready for what comes next.

Computing lessons can place great demands on pupils' working memory. Teaching must work to manage this demand and ensure that pupils can think about the intended subject content. Due to the hierarchical nature of many aspects of computing subject knowledge, it is important that pupils' prior knowledge is taken into account when planning teaching and in the selection of teaching activities.

In this review, we have focused on the number of specialist staff in schools. The number of subject specialists in computing is low, and there is a lack of new teachers to improve the situation. This will have significant consequences for the quality of education that pupils receive in computing if nothing is done to remedy the situation. This further strengthens the argument for a focus on subject-specific CPD.

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Part F: Computing (and ICT) - Good (in 'old' money[2])

Ofsted produced this guidance to support their subject specific reviews (E above)

Outcomes

- Pupils make good progress across all areas of the subject and show originality, imagination and creativity in their work. They understand important concepts in Computing and make connections within the subject.
- Pupils use their subject knowledge and understanding effectively in written and verbal explanations and can solve challenging problems.
- Pupils make good use of a wide range of hardware and software appropriate to their age and ability.
- Pupils are able to work independently when given the opportunity, taking the initiative in their work and when working with others. Pupils take the initiative in, for example, asking questions, carrying out their own investigations, and working constructively with others.
- Pupils enjoy using Computing and can explain its value

Teaching

Pupils have a clear understanding of the value of Computing. Pupils' understanding of important concepts as well as their proficiency in techniques and recall of knowledge is developed, equipping pupils to work independently.

Teachers have a good level of specialist expertise, including good technical skills, which along with accurate assessment of individual pupils' prior knowledge and understanding, is used well in planning and teaching their subject.

Pupils understand the value of Computing, its impact on society and how it relates to their lives, due to teachers using a range of appropriate contexts in lessons.

Teachers respond well to pupils' questions through effective dialogue and feedback, and correct errors and misconceptions accurately and effectively.

Teachers of Computing communicate high expectations, about their subject to pupils, encouraging them to produce the best work they can.

Good learning across all aspects of the subject is promoted through the use of an appropriate range of resources and teaching strategies.

[2] Taken from the Subject Specific Guidance (Ofsted 2013)

Curriculum

1. The Computing curriculum is broad, balanced and well informed by current initiatives in the subject. It matches well the needs of the large majority of pupils and ensures effective continuity and progression in their learning in the subject. All areas of the curriculum receive good coverage for all pupils, in Computing lessons or across the school curriculum.
2. Pupils are able to use most of their Computing skills in realistic situations. The contexts in which Computing is taught are relevant to pupils' lives and reflect current practice in Computing from the world of industry. Good links are forged with other agencies and the wider community to provide a range of enrichment activities to promote pupils' learning and their engagement with the subject. These may include Computing -based clubs, visits to sites where Computing is at the heart of activities, and presentations from visiting Computing professionals.
3. Pupils benefit from opportunities to use their Computing knowledge, skills and understanding in realistic and challenging situations.
4. Links with other subjects in the school are productive in strengthening pupils' learning in Computing.
5. Students in key stages 4 and 5 have access to appropriate Computing qualifications.
6. Pupils demonstrate good knowledge and understanding of how to stay safe when using new technologies.
7. Opportunities to promote pupils' spiritual, moral, social and cultural development are planned and delivered systematically.

Leadership & management

- Leaders are well informed by current developments in the subject.
- Subject reviews, self-evaluation and improvement planning are clearly focused on improving provision and raising attainment in Computing.
- There is a shared common purpose amongst those involved in teaching the subject, with good opportunities to share practice and access subject training.
- Continuing professional development is targeted, includes training for teaching assistants and technical support staff, and is evaluated for its impact.
- Computing has a prominent profile in the school. Access to Computing equipment is good for all pupils and teachers. The Computing infrastructure enables pupils and staff to have good access to their work and to the school's learning resources, and contributes to pupils' achievement.
- Computing makes a good contribution to whole-school priorities, including literacy and numeracy policies.
- E-safety is a priority in the school, with teaching and non-teaching staff receiving regular and up-to-date training. At least one staff member is likely to have received accredited training in e-safety. E-safety policies and procedures are in place, contributed to by the whole school, updated regularly and ratified by governors.

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Part G: Computing: Quality of Education (Good)

This template includes the current criteria for the Quality of Education judgment of 'Good' along with columns for the SL / SLT to insert where they perceive is a best-fit with the 'old' subject specific criteria along with their own internal evidence.
As such it serves two purposes, one as a CPD activity to consider the match between the 'old' subject specific criteria and then 'new' criteria and secondly to benchmark / evaluate the school's provision against this.

INTENT		
NEW HANDBOOK	**EVIDENCE**	**OLD SUBJECT CRITERIA**
Leaders adopt or construct a curriculum that is ambitious and designed to give all pupils, particularly disadvantaged pupils and including pupils with SEND, the knowledge and cultural capital they need to succeed in life. This is either the national curriculum or a curriculum of comparable breadth and ambition. [*If this is not yet fully the case, it is clear from leaders' actions that they are in the process of bringing this about.]*		
The school's curriculum is coherently planned and sequenced towards cumulatively sufficient knowledge and skills for future learning and employment. *[If this is not yet fully the case, it is clear from leaders' actions that they are in the process of bringing this about.]*		
The curriculum is successfully adapted, designed or developed to be ambitious and meet the needs of pupils with SEND, developing their knowledge, skills and abilities		

to apply what they know and can do with increasing fluency and independence. *[If this is not yet fully the case, it is clear from leaders' actions that they are in the process of bringing this about.]*		

IMPLEMENTATION		
NEW HANDBOOK	**EVIDENCE**	**OLD SUBJECT CRITERIA**
Teachers have good knowledge of the subject(s) and courses they teach. Leaders provide effective support for those teaching outside their main areas of expertise.		
Teachers present subject matter clearly, promoting appropriate discussion about the subject matter being taught. They check pupils' understanding systematically, identify misconceptions accurately and provide clear, direct feedback. In so doing, they respond and adapt their teaching as necessary without unnecessarily elaborate or individualised approaches.		
Over the course of study, teaching is designed to help pupils to remember long term the content they have been taught and to integrate new knowledge into larger ideas.		
Teachers and leaders use assessment well, for example to help pupils embed and use knowledge fluently, or to check understanding and inform teaching. Leaders understand the limitations of assessment and do not use it in a way that creates unnecessary burdens on staff or pupils.		

Teachers create an environment that focuses on pupils. The textbooks and other teaching materials that teachers select – in a way that does not create unnecessary workload for staff – reflect the school's ambitious intentions for the course of study. These materials clearly support the intent of a coherently planned curriculum, sequenced towards cumulatively sufficient knowledge and skills for future learning and employment.		
The work given to pupils is demanding and matches the aims of the curriculum in being coherently planned and sequenced towards cumulatively sufficient knowledge.		
Reading is prioritised to allow pupils to access the full curriculum offer.		
A rigorous and sequential approach to the reading curriculum develops pupils' fluency, confidence and enjoyment in reading. At all stages, reading attainment is assessed and gaps are addressed quickly and effectively for all pupils. Reading books connect closely to the phonics knowledge pupils are taught when they are learning to read.		
The sharp focus on ensuring that younger children gain phonics knowledge and language comprehension necessary to read, and the skills to communicate, gives them the foundations for future learning.		
Teachers ensure that their own speaking, listening, writing and reading of English		

support pupils in developing their language and vocabulary well.		

IMPACT		
NEW HANDBOOK	**EVIDENCE**	**OLD SUBJECT CRITERIA**
Pupils develop detailed knowledge and skills across the curriculum and, as a result, achieve well. This is reflected in results from national tests and examinations that meet government expectations, or in the qualifications obtained.		
Pupils are ready for the next stage of education, employment or training. They have the knowledge and skills they need and, where relevant, they gain qualifications that allow them to go on to destinations that meet their interests and aspirations and the intention of their course of study. Pupils with SEND achieve the best possible outcomes.		
Pupils' work across the curriculum is of good quality.		
Pupils read widely and often, with fluency and comprehension appropriate to their age. They are able to apply mathematical knowledge, concepts and procedures appropriately for their age.		

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Part H: Computing: Quality of Education (exemplar) *This is the authors initial interpretation of a best-fit between the previous (Part F) subject criteria and the current (2021) QoE (2021) criteria (Part G) above.*

INTENT		
NEW HANDBOOK	**EVIDENCE**	**OLD SUBJECT CRITERIA**
Leaders adopt or construct a curriculum that is ambitious and designed to give all pupils, particularly disadvantaged pupils and including pupils with SEND, the knowledge and cultural capital they need to succeed in life. This is either the national curriculum or a curriculum of comparable breadth and ambition. [*If this is not yet fully the case, it is clear from leaders' actions that they are in the process of bringing this about.]*		Leaders are well informed by current developments in the subject. There is a shared common purpose amongst those involved in teaching the subject, with good opportunities to share practice and access subject training. The Computing curriculum is broad, balanced and well informed by current initiatives in the subject. It matches well the needs of the large majority of pupils and ensures effective continuity and progression in their learning in the subject. All areas of the curriculum receive good coverage for all pupils, in Computing lessons or across the school curriculum.
The school's curriculum is coherently planned and sequenced towards cumulatively sufficient knowledge and skills for future learning and employment. *[If this is not yet fully the case, it is clear from leaders' actions that they are in the process of bringing this about.]*		Pupils benefit from opportunities to use their Computing knowledge, skills and understanding in realistic and challenging situations. Links with other subjects in the school are productive in strengthening pupils' learning in Computing. Students in key stages 4 and 5 have access to appropriate Computing qualifications.
The curriculum is successfully adapted, designed or developed to be ambitious and meet the needs of pupils with SEND, developing their knowledge, skills and abilities to apply what they know and can do with increasing fluency and independence. *[If this is not yet fully the case, it is*		

clear from leaders' actions that they are in the process of bringing this about.]		

IMPLEMENTATION		
NEW HANDBOOK	**EVIDENCE**	**OLD SUBJECT CRITERIA**
Teachers have good knowledge of the subject(s) and courses they teach. Leaders provide effective support for those teaching outside their main areas of expertise.		Teachers have a good level of specialist expertise, including good technical skills, which along with accurate assessment of individual pupils' prior knowledge and understanding, is used well in planning and teaching their subject. Continuing professional development is targeted, includes training for teaching assistants and technical support staff, and is evaluated for its impact.
Teachers present subject matter clearly, promoting appropriate discussion about the subject matter being taught. They check pupils' understanding systematically, identify misconceptions accurately and provide clear, direct feedback. In so doing, they respond and adapt their teaching as necessary without unnecessarily elaborate or individualised approaches.		Teachers of Computing communicate high expectations, about their subject to pupils, encouraging them to produce the best work they can. Teachers respond well to pupils' questions through effective dialogue and feedback, and correct errors and misconceptions accurately and effectively.
Over the course of study, teaching is designed to help pupils to remember long term the content they have been taught and to integrate new knowledge into larger ideas.		Pupils understand the value of Computing, its impact on society and how it relates to their lives, due to teachers using a range of appropriate contexts in lessons. Good learning across all aspects of the subject is promoted through the use of an appropriate range of resources and teaching strategies.
Teachers and leaders use assessment well, for example to help pupils embed and use knowledge fluently, or to check understanding and inform teaching. Leaders understand the limitations of assessment and do not use it in a way that creates		Teachers respond well to pupils' questions through effective dialogue and feedback, and correct errors and misconceptions accurately and effectively.

unnecessary burdens on staff or pupils.		
Teachers create an environment that focuses on pupils. The textbooks and other teaching materials that teachers select – in a way that does not create unnecessary workload for staff – reflect the school's ambitious intentions for the course of study. These materials clearly support the intent of a coherently planned curriculum, sequenced towards cumulatively sufficient knowledge and skills for future learning and employment.		Pupils understand the value of Computing, its impact on society and how it relates to their lives, due to teachers using a range of appropriate contexts in lessons.
The work given to pupils is demanding and matches the aims of the curriculum in being coherently planned and sequenced towards cumulatively sufficient knowledge.		Teachers of Computing communicate high expectations, about their subject to pupils, encouraging them to produce the best work they can.
Reading is prioritised to allow pupils to access the full curriculum offer.		
A rigorous and sequential approach to the reading curriculum develops pupils' fluency, confidence and enjoyment in reading. At all stages, reading attainment is assessed and gaps are addressed quickly and effectively for all pupils. Reading books connect closely to the phonics knowledge pupils are taught when they are learning to read.		
The sharp focus on ensuring that younger children gain phonics knowledge and language comprehension necessary to read, and the skills to communicate, gives them the foundations for future learning.		

Teachers ensure that their own speaking, listening, writing and reading of English support pupils in developing their language and vocabulary well.		

IMPACT		
NEW HANDBOOK	**EVIDENCE**	**OLD SUBJECT CRITERIA**
Pupils develop detailed knowledge and skills across the curriculum and, as a result, achieve well. This is reflected in results from national tests and examinations that meet government expectations, or in the qualifications obtained.		Pupils make good progress across all areas of the subject and show originality, imagination and creativity in their work. They understand important concepts in Computing and make connections within the subject. Pupils use their subject knowledge and understanding effectively in written and verbal explanations and can solve challenging problems.
Pupils are ready for the next stage of education, employment or training. They have the knowledge and skills they need and, where relevant, they gain qualifications that allow them to go on to destinations that meet their interests and aspirations and the intention of their course of study. Pupils with SEND achieve the best possible outcomes.		Pupils make good use of a wide range of hardware and software appropriate to their age and ability. Pupils are able to work independently when given the opportunity, taking the initiative in their work and when working with others. Pupils take the initiative in, for example, asking questions, carrying out their own investigations, and working constructively with others. Pupils enjoy using Computing and can explain its value.
Pupils' work across the curriculum is of good quality.		Pupils make good progress across all areas of the subject and show originality, imagination and creativity in their work. They understand important concepts in Computing and make connections within the subject.
Pupils read widely and often, with fluency and comprehension appropriate to their age. They are able to apply mathematical knowledge, concepts and procedures appropriately for their age.		Computing makes a good contribution to whole-school priorities, including literacy and numeracy policies.

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Part I: Preparing for a subject specific deep-dive: Computing

Resources (to have at hand)

- Computing self-evaluation report
- Computing development (action) plan
- Long / medium term planning, including your progression map (skills; knowledge)
- Examples of pupil's work across year groups (at least from say EY / KS1 / KS2), including sequential learning

Suggested questions:
(When responding to any questions, try not to focus solely on 'describing' what you / colleagues have been engaged in, BUT: what has been the impact / outcome of any actions.)

- Talk me through how you have designed and planned the Art & Design curriculum / is it the school's own design or a published scheme?
- What is your rationale behind it?
- How does the Computing curriculum fit in with the wider school curriculum?
- How does the plan from Y1-Y6 develop pupil's Computing skills and knowledge as they progress through the school and how does it impact on their wider school life? (can you give specific examples of which skills are developed, when and where?)
- How are lessons planned to include age-appropriate skills, as per your progression map, and how are they implemented?
- Can you demonstrate how pupils' skills (in computer studies; information technology and data literacy) are built upon year upon year?
- How do you assess pupil's learning during lessons? (Can you give me an example / two?)
- What opportunities are there for pupils to self and peer assess during lessons / end of topics and how is this helping their learning?
- How have you developed / modified the Computing curriculum in recent years and why?
- How do you know that pupil's have retained the skills and knowledge that they learn during a lesson?
- Can you explain how the lesson we are about to see / have just seen fits within this topic / why are the pupils learning 'this' at this time of the school year? (e.g. 'how was this lesson on data retrieval linked to previous work undertaken and …what skills would you expect the pupils to gain in this topic that they will then develop in their next topic?'.)

- Referring to the lesson ‘we’ are about to observe: (e.g. how do you envisage the lesson will be differentiated to meet then needs of those pupils with SEND / the more able pupils?)
- If there is to be a TA in the classroom (e.g. can you tell me what CPD the TA has had on specific Computing skills and techniques?)
- ‘Thank you for the portfolio of pupils’ work you have shared with me… (e.g. can you explain the reasoning behind the pieces you have selected? / can you explain to me which specific skills from the Computing curriculum (e.g. predicting the behaviour of simple programs) are being developed through these examples? / how are these being developed from year to year?)
- How does pupils learning in KS1 build on pupils’ experiences and development from the EYFS?
- What enrichment activities are offered to pupils and how does this support their Computing skills, knowledge and understanding?
- How does the Computing curriculum contribute to pupils cultural capital / development?

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Annex 1: Computing / ICT – Outstanding (in 'old' money[3])

Achievement

- Pupils demonstrate excellent understanding of important concepts in ICT and are able to make connections within the subject because they have highly developed transferable knowledge, skills and understanding.
- Pupils consistently use their subject knowledge and understanding very effectively in written and verbal explanations and can solve challenging problems.
- Pupils make highly effective use of a wide range of hardware and software appropriate to their age and ability.
- Pupils show exceptional independence in their use of ICT across all areas of the curriculum and exhibit very positive attitudes towards ICT. They take the initiative, for example, by asking questions, carrying out their own investigations, and working constructively with others.
- Pupils show high levels of originality, imagination, creativity and innovation in their understanding and application of skills in ICT.

Teaching

- Teaching is informed by excellent subject knowledge and understanding of continuing developments in teaching and learning in ICT.
- Learning is effectively secured though a high level of teacher competence and expertise, both in terms of their specialist knowledge and technical skills, and in their understanding of active learning in ICT.
- Pupils are able to make connections between individual topics and in seeing the 'big picture'. Pupils' understanding of important concepts and progression within the lesson and over time is central to teaching.
- Lessons address pupils' misconceptions very effectively. Teachers' responses to pupils' questions are accurate and highly effective in stimulating further thought.
- Pupils secure outstanding progress due to carefully planned, imaginative lessons.
- Teachers communicate high expectations, enthusiasm and passion about ICT to pupils. They challenge and inspire pupils to produce the best work they can.
- Pupils' active participation in learning and their outstanding progress across all aspects of the subject are stimulated through the use of a very wide range of innovative and imaginative resources and teaching.

[3] Ofsted Dec 2013

Curriculum

- The imaginative and stimulating ICT curriculum is very skillfully designed to match to the full range of pupils' needs and to ensure highly effective continuity and progression in their learning. The curriculum is broad and balanced with all areas covered extremely well for all pupils, in ICT lessons and/or across the school curriculum.
- The contexts in which ICT is taught are relevant to pupils' lives and reflect the increasing use of ICT in the world of industry. Excellent links are forged with other agencies and the wider community to provide a wide range of enrichment activities to promote pupils' learning and engagement with the subject. These may include ICT-based clubs, visits to sites where ICT is at the heart of activities, and presentations from visiting ICT professionals.
- Pupils are expected to use their ICT knowledge, skills and understanding in realistic and challenging situations.
- Links with other subjects in the school are highly productive in strengthening pupils' learning in ICT.
- Students in key stages 4 and 5 have access to a wide range of appropriate ICT qualifications, including academic and vocational options.
- Pupils have comprehensive knowledge and understanding of how to stay safe when using new technologies.
- Rigorous curriculum planning ensures the subject makes an outstanding contribution to pupils' spiritual, moral, social and cultural development.

Leadership & management

- Leadership is informed by a high level of subject expertise and vision which has a clear impact on the performance and practice of members of the department and on outcomes for pupils.
- There is a strong track record of innovation in ICT. Subject reviews, self-evaluation and improvement planning are well-informed by current good practice in ICT education. This may involve participation in partnerships with other ICT providers in a wider area.
- Subject leadership inspires confidence and wholehearted commitment from pupils and colleagues. There are effective strategies to delegate subject responsibilities where appropriate and to share good practice and secure high-quality professional development in the subject.
- Continuing professional development is well targeted and thoroughly evaluated for its impact. It includes up-to-date training for teaching assistants and technical support staff.
- ICT has a very high profile in the life of the school and is at the cutting edge of initiatives to raise pupil progress. Access to ICT equipment is outstanding, and the school is likely to have promoted the use of mobile technologies. The ICT infrastructure enables pupils and staff to have very good access to their work and to the school's learning resources at all times, and contributes to pupils' achievement.
- ICT makes an excellent contribution to whole-school priorities, including consistent application of literacy and numeracy policies.
- E-safety is a priority across all areas of the school, with all teaching and non-teaching staff receiving regular and up-to-date training. At least one staff member will have received accredited training in e-safety. Rigorous e-safety policies and procedures are in place, written in plain English, contributed to by the whole school, updated regularly and ratified by governors.