Computing at Byfield School:

What is Digital Literacy?

While the word "literacy" alone generally refers to reading and writing skills, when you tack on the word "digital" before it, the term encompasses much, much more. Sure, reading and writing are still very much at the heart of digital literacy. But given the new and ever-changing ways we use technology to receive and communicate information, digital literacy also encompasses a broader range of skills—everything from reading on a Kindle to gauging the validity of a website or creating and sharing YouTube videos. (Education Week, November 2016) Hiller Spires, a professor of literacy and technology at North Carolina State University, views digital literacy as having three buckets: 1) finding and consuming digital content; 2) creating digital content; and 3) communicating or sharing it.

What is Computer Science? What is a Computer Scientist?

Computer science is the study of computers and computing concepts. It includes both hardware and software, as well as networking and the Internet… The software side of computer science covers programming concepts as well as specific programming languages. Programming concepts include functions, algorithms, and source code design. (TEchterms.com)

As a subject, Computer Science requires logical thinking, creativity and problem solving (University of York)

Computer science is a very large subject with lots of applications. Computer scientists design new software, solve computing problems and develop different ways to use technology. (BBC Bitesize)

Children at Byfield School are computer scientists because they are digitally literate:

- Children learn how to use a computer efficiently
- Children learn how to stay safe online – using the internet and email safety
- Children Learn Word Processing Skills
- Children learn how to combine text, videos and images to create digital content (presentations, websites, youtube clips etc)
- Children learn how to use computers to organise and process numbers and data – through questionairres, quizes, polls, databases, spreadsheets and to create graphs.

Children at Byfield School are computer scientists because learn coding, scripting and programming:

- Children design, write and debug programs.
- Children decompose problems into smaller parts
- Children learn key commands computer scientists use in all languages write programs for example: repeats and loops, sequence, conditionals, variables, input and output, co-ordinates and random-number generation.
- Children use logical reasoning to explain how some simple algorithms work,
- Children detect and correct errors in algorithms and programs.

Progression Tables:

Essential Skills	EYFS	Year 1 and 2		
ICT Digital Literacy.	Recognise that a range of technology is used in homes and in schools. Use a simple application on a computer or mobile device. Use computing devices to interact with age-appropriate applications. Create simple representations of events, people and objects.	• Use a range of applications and devices in order to communicate ideas, work and messages. • Communicate ideas, work and messages. • Gather information from different sources. • Demonstrate the ability to use a range of computer programmes to depict the key events of world war one in interesting and creative ways. • Understand how online services work. • Explore a website to find information. • Use online resources independently, safely and responsibly. • Use animation software to create a short film, including music and illustrations. • **Use technology purposefully to create, organise,**	• Use some of the advanced features of applications and devices in order to communicate ideas, work or messages professionally. • 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 on a range of digital devices to accomplish given goals, including collecting, analysing, evaluating and presenting data and information. • Give examples of the risks posed by online communications. • Understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web; and the	• Select, use and combine a variety of software (a range of digital devices to accomplish given goals, including collecting, analysing, evaluating and presenting data and information.) • Use many of the advanced features of a range of applications and devices in order to communicate ideas, work and messages. • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. • Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.

		store, manipulate and retrieve digital content.	opportunities they offer for communication and collaboration. • Organise and manipulate data in a range of digital formats.	
ICT coding, scripting and programming	•	• understand what algorithms are; how they are implemented as programs on digital • devices; a nd that programs execute by following precise and unambiguous instructions • create and debug simple programs • use logical reasoning to predict the behaviour of simple programs	• I can use repeat commands. • Use logical thinking to solve an open-ended problem by breaking it up into smaller parts. • Use an IF Statement (conditional event) • Change variables to alter an objects size, shape, colour, or other property. • Recognise an error in a program and debug it.	• design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems: ○ solve problems by decomposing them into smaller parts ○ Explain and program each of the steps in my algorithm. ○ evaluate the effectiveness and efficiency of my algorithm while I continually test the programming of that algorithm. • use sequence, selection, and repetition in programs; work with variables and various forms of input and output; ○ recognise when I need to use a variable to achieve a required output. ○ use a variable and operators to stop a program. ○ I can use different inputs (including sensors) to control a device or onscreen action and predict what will happen. • use logical reasoning to explain how some simple algorithms work and to detect and

				• correct errors in algorithms and programs

How do we cater for children who are more able in Mathematics?

What We Believe	Provision
The characteristics of a More able pupil: • Have a secure subject knowledge and can recall it quickly • They work systematically, • They are able to come up with their own solutions to problems, and use their knowledge to think creatively • Are able to work with a wide range of children being good leaders or team members • Are able to apply that subject knowledge in a range of different contexts • Are able to communicate their understanding efficiently. • Are able to use reasoning skills (not just in maths but across every subject) to construct sound explanations and arguments based on secure subject knowledge • Are able to analyse, evaluate and create (Blooms Taxonomy) drawing from good subject knowledge. • Children are able to self-check, identify mistakes more independently and edit and improve their work. • Use Enquiry skills	Teachers assess children's knowledge and vocabulary– and ensure this knowledge is complete and quick. Challenges designed to reason, explain, evaluate, problem solve and create. Opportunities are built in for them to work with other more able children, but also in mixed ability groups. Challenges are designed so that they are more open ended – to encourage creative solutions and systematic working. Teachers adapt their marking to provide additional challenge through giving the children opportunities for reasoning, evaluation, editing and communicating their learning.
Opportunities for More Able	Children have open-ended tasks which they are expected to analyse, evaluate or create.

More able children need opportunities show they have a deeper level of understanding. Blooms Taxonomy states the higher level thinking is through analysing, (breaking down information into component parts), Evaluating (judging the value of information or ideas) and Creating (combining parts to make a new whole) More able children should have the opportunity to communicate, present and produce work for an audience.	Opportunities are built in so children that are more able produce work for a specific audience – for example producing letters, presentations or displays to communicate their knowledge. Children take part in inter-house competitions for Mathematics – using recall, investigating, reasoning and problem-solving skills.
Errors and Misconceptions: More able children may struggle with getting things wrong and like all children need to be taught a growth mindset. Being able to identify mistakes and self-correct or edit is a characteristic of a working at a deeper level within a subject – however this is something which needs to be taught and practiced. More able children have accurate and quick recall of knowledge and shouldn't be making consistent mistakes in foundational learning if it is secure – if they are making lots of mistakes this shows a gap in their understanding and it needs to be addressed. Likewise if this is not quick, it shows a gap which needs to be addressed.	Growth mindset is taught to all children – and the language used for marking is green for growth – this could be to correct a mistake more move onto harder challenge. Self and peer marking and editing is part of everyday teaching practice. Children will still have access to full foundational learning (for example times tables, grammar) but will be expected to be quick and accurate. If it is not, quality first teaching will be used to address this.
More able children still need to be taught a full broad and balanced curriculum Pupils are often labelled as Maths marvels from an early age because they are quick to learn, apply facts and algorithms, and can work speedily through a series of questions. Historically this 'G&T' labelling resulted in a child being pushed forward far too quickly and missing out on a completely rounded Maths curriculum. This can often be the case for other subjects.	Ensure that before children more onto a challenge – they are secure in the foundational skills and have the complete knowledge of the curriculum for their age group. Formative assessment is used effectively to identify what needs to be taught and what knowledge is already in place.

How do we cater for SEND in Mathematics?

What we Know / What we believe	Provision
At Byfield we believe the importance of maintaining an inclusive learning environment	SEND children still have 100% access to maths lessons – they are not removed for interventions unless there are specific interventions which are assessed to address a crucial learning need which would prevent them from leading a successful and rewarding life.
Some children may need differentiated adaptations to be made – so they can access the same learning.	Teachers adapt and design learning so that it means children can access the next step of learning. Children are able to access concrete equipment, number cards etc to aid learning. Classroom Secrets and Twinkl are used to provide differentiated learning and appropriate challenges.
Maths is a vocabulary-rich and vocabulary dependant subject – SEND children who struggle with retaining vocabulary need extra support.	Key vocabulary is explicitly taught – with time for consolidation. Key words are explained and used repeatedly to ensure they are memorable. Key words are displayed – either on board during lesson or on displays.
Maths requires knowledge to be 'sticky' – children need to recall basic facts (arithmetic) and remember learning to build on knowledge and apply / inter-connect from one lesson / topic to the next. – SEND children who struggle with memory retention will need extra support and experiences to link knowledge / skills to.	Lessons are planned so they are progressive, and knowledge from one lesson is built upon in the next. Teachers train children to recognise where skills taught before are being used / applied to learning (making connections across topics) Arithmetic skills, number facts (KS1) and timestables (KS2) are practised daily.

Assessment

What we Know / What we believe	Provision
Formative	Cold tasks are used at the start of a topic Children are given a breakdown of the I Cans that they will be looking at during a topic Children assess themselves against the I Cans

	Hot task assessment used ta the end
Summative	Opportunities are sought to constantly assess children's understanding throughout a lesson – through talk partners, hands up/ hands down, quick fire questions and group work Children and teachers tick TILTs Challenge, booster and next step strategies are used as appropriate to consolidate / move on / challenge Planning is flexible to react to children's learning needs

Pedagogical Approach – Inspire, Challenge, Succeed

What we Know / What we believe	**Provision**
Inspire	Use of different teaching strategies including concrete equipment, pictorial representations, bar models, mental jottings and written methods so children feel safe and inspired to show their thinking in different ways Pupils are inspired by different challenges and learning opportunities such as investigations, pattern-finding, real-life mathematics and applying skills.
Challenge	Classroom Secrets and Twinkl are widely used to help provide differentiated challenges in inclusive lessons. Children are able to progress during the lesson moving up through learning steps – Bronze, Silver, Gold, Platinum or, 1,2,3 stars (Twinkl) or D, E, GD (Classroom Secrets) Additional challenges, extension opportunities are used as appropriate and can be seen in the marking by an arrow. KS2 use Mastery Menus for More Able pupils to independently display deeper understanding.
Succeed	Different strategies are used to help children to reflect on their learning. We reflect on the learning journey and improvements rather than getting things right / wrong. Children are rewarded for good maths skills and effort regardless of right/wrong answers Strategies include: Self and Peer marking Working as a group Reflecting on how they have developed / improved Applying skills to problem solving
Mapping	KS1 – number bonds and facts are practised daily KS2 – arithmetic skills are practised daily and all skills are repeated throughout the year These skills have been taken from National Curriculum and identified as basic skills that are needed to "stick" in order to be applied across different mathematics topics Topics are mapped through White Rose overviews and adapted by teachers to suit term times and prioritise (eg, Yr 2 and Yr 6) Calculation Policy
Skills Progression is needed to apply knowledge	White Rose – progressive planning

	What reasoning looks like across classes What problem solving looks like across classes What vocabulary should be used across classes Daily arithmetic Daily number facts / times tables practice

SMSC

What we Know / What we believe	Provision
Spiritual	Sense of achievement from recognising progression and improvement in FAST maths
Moral	
Social	Sense of belonging working in pairs and groups Valuing others and their contributions
Cultural – Including Cultural Capital	

British Values

What we Know / What we believe	Provision