

Berkswich CE Primary School			
Reference Number C2	Shared with Staff	Ratified by Governing Board	Review Date July 2024
Policy Title	Maths Policy		

Legal framework

This policy has due regard to statutory guidance including, but not limited to, the following:

- DfE (2013) 'National curriculum in England: Mathematics programmes of study' (www.berkswichceprimary.co.uk)
- DfE (2017) 'Statutory framework for the early years foundation stage' (www.berkswichceprimary.co.uk)

The intent of the maths curriculum

Our maths curriculum has been devised in accordance with our whole school vision and curriculum intent, which aims to enable all children to flourish and excel and to become life-long learners. Our curriculum intent is for every child to tackle the subject with delight and enjoyment; it recognises the need to provoke questions and discussions and to stimulate curiosity.

The maths curriculum at Berkswich is grounded in the belief that maths is a vital means by which children are introduced to concepts, language, skills and thinking-strategies essential in everyday life. Our systematic and progressive curriculum, supported by White Rose, is designed so that children have a depth of understanding and work towards achieving mastery of the concepts covered. Our aim is for all children to be fluent and confident mathematicians who have excellent numerosity and flexibility with number, applying this to formal methods and to abstract problem-solving challenges with efficiency, using mental methods where appropriate. Where more formal methods are included, these are deeply rooted in the understanding of underlying concepts.

Berkswich CE maths curriculum is ambitious for every child including SEND and other vulnerable groups. Greater depth and mastery opportunities are available for all pupils in recognition that we believe everyone can be a successful mathematician. We acknowledge the importance of challenge as an integral part of lessons; children approach reasoning and abstract problem solving with resilience and tenacity by forming meaningful connections to previous learning within a culture whereby mistakes are expected and creativity and flexibility are valued. The journey of problem solving and reasoning is celebrated and children are able to explain and justify their choices using mathematical vocabulary to ensure efficiency and accuracy.

Our curriculum supports children in being bold mathematicians. It recognises that maths is a highly inter-connected discipline and it is essential to everyday life, both now and in the future. Our curriculum supports children in applying their understanding to make new discoveries and rich connections across a range of subjects, guided by the expertise of the teacher.

Definitions	
Abstract method	Solving problems using numbers or symbols without the support of concrete or pictorial representations.
Efficiency	Efficiency in maths is choosing the most appropriate method. For example: using mental methods and related facts to solve $5,400 \div 9$ instead of formal written methods such as bus stop division.
Fluent	Manipulate numbers efficiently and being able to select the most appropriate method for the task and apply a skill to multiple contexts.
Greater Depth	Problem solving, reasoning and completing abstract challenges by connecting learning at a deeper level.
Mastery	Pupils understand underlying concepts and can confidently reason and problem solve in a taught topic.
Numerosity	Immediate and accurate recognition of the number of objects in a small group without the need to count them develop children's number facts (also known as subitising).
Problem solving	Apply mathematical understanding to a range of routine and non-routine problems with increasing sophistication.
Reasoning	The ability to make logical links and connections to previous learning which help tackle a new maths problem ensuring that children can explain why and justify their methods and thinking.

The Implementation of the maths curriculum

➤ Meeting the aims of the National Curriculum (NC)

Berkswich CE delivers a rich, broad and balanced maths curriculum, in line with national requirements, which aims to enable pupils to:

- become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding, number sense and the ability to recall and apply knowledge rapidly and accurately.
- reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can **solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and seeking solutions with perseverance and resilience.

➤ Maths in the Early Years (EYFS)

Maths in the EYFS involves providing children with purposeful and engaging opportunities to develop and improve their skills in counting, understanding and using numbers, calculating and simple addition and subtraction problems. There are also rich experiences in which children learn to describe shapes, spaces, and measure.

In planning and guiding children's activities, our teachers constantly reflect on the different ways that children learn and this is seen in their practice. Reception follow the White Rose scheme and carefully this is carefully tailored to the needs of the class and individual children. It allows the teaching staff to provide all children with rich mathematical opportunities through playing, exploring and active learning. The use of age-appropriate mathematical language is encouraged and enhanced from the outset. Children are continually encouraged to tackle difficulties with determination and creativity, developing strategies for solving problems and thus allowing every child to think critically and make meaningful connections in their learning.

➤ Teaching and learning

Berkswich CE has developed a mastery approach to learning in mathematics – a mastery that we want all pupils to acquire. Our approach to teaching maths has the aim of expertly supporting children over time to acquire mastery of the subject. We believe that ‘master’ means a deep, long-term, secure and adaptable understanding of the subject which is in tune with the NC aims as stated above.

Mathematics is an interconnected subject in which pupils need to be able to move fluently between the various mathematical ideas; however, the programmes of study are organised into distinct domains. Supported by the teachers, children make rich connections across concepts to develop fluency, mathematical reasoning skills and competence in solving increasingly sophisticated problems within every unit. Children have regular opportunities to revisit and apply learning from previously taught units in a variety of problems and contexts to consolidate understanding, ensuring concepts become embedded. This is completed during Flashback Four daily maths starters and through purposeful interleaving of units in the White Rose scheme. Please visit our website to view the whole school overview of these units.

Aiming for all children achieving mastery of the key concepts in maths means narrowing the gap between the most and least able learners; our expectation is that the majority of the pupils will move through the units at broadly the same pace. However, decisions about when to progress will always be based on the security of pupils’ understanding and their readiness to move to the next stage. Pupils who grasp concepts rapidly will be challenged through being offered rich and sophisticated problems before any acceleration through new content. We do not set children since research demonstrates the adverse effect on children’s progress (Education Endowment Foundation). Those children who are not sufficiently fluent with earlier material will consolidate their understanding through timely intervention. Support is also achieved through a range of strategies, such as skilled teacher and teaching assistant targeted questioning and guidance, the use of adapted provision, carefully selected scaffolding and differentiation.

We believe that children in all year groups, when introduced to a key new concept, should have the opportunity to build competency in this topic by taking the concrete-pictorial-abstract approach:



- Concrete – children should have the opportunity to use concrete objects and manipulatives to help them to understand what they are doing.
- Pictorial – children should then build on this concrete approach by using pictorial representations. These representations can subsequently be used to reason and solve problems.
- Abstract – with the foundations firmly laid, children should be able to move to an abstract approach using numbers and key concepts with understanding and confidence, drawing on strategies and skills learnt through concrete and pictorial representations.

In practice, teachers may model concepts, such as subtraction, to children using multiple representations such as base ten blocks or place value counters to ensure the concept is fully understood and misconceptions are spotted. This ensures that procedural and conceptual understanding are developed simultaneously.

Lessons demonstrate a balance of interactive and independent elements used in teaching, ensuring that all pupils engage with their learning. During our daily lessons, we encourage children to ask as well as answer mathematical questions. We develop their ability to independently select and use appropriate concrete apparatus to support their conceptual understanding and build procedural fluency. Children have access to a wide range of resources, such as bead frames, number lines, place value cards and Dienes/Base ten apparatus to support learning. We develop the children's ability to represent problems using visualisation skills, jottings and pictorial representations, including empty number lines, the 'Singapore Bar Model' and their own ideas. Wherever possible, we provide meaningful and realistic contexts and encourage the children to apply their learning to everyday situations so that all children will view themselves as mathematicians as they are surrounded by this subject in the everyday contexts. Efficient methods of calculation are promoted but only when underpinned by a firm understanding of the concepts involved. At all times, the curriculum intent and aims are the drivers behind the planning and delivery of lessons.

Please see the school website (www.berkswichceprimary.co.uk) for further overviews of the curriculum and the progressive calculation policy which is used across school.

➤ **Mastering Number**

Our school improvement priority is for children to further increase their fluency and flexibility with number facts and relationships. This is being achieved in Reception, Year One and Year Two through the rigorous Mastering Number (NCETM) programme which will create stronger foundations for deeper learning within mathematics. Through four sessions a week, discrete from daily maths lessons, children increase their number sense, fluency in calculation and confidence and flexibility with number. This will allow children to develop a secure understanding of how to build firm mathematical foundations. Attention will be given to key knowledge and understanding needed in Reception classes, and progression through KS1 to support success in the future. Children will develop the use of appropriate manipulatives, such as rekenreks, to support teaching and learning of mathematical structures.

Staff in these year groups receive regular, high-quality CPD from NCETM to develop intentional teaching strategies focused on developing fluency in calculation and number sense for all children and they will also contribute to an online community to share practice and engage in critical reflection. The maths lead has developed a grab-and-go system of resources so that these can be delivered effectively by all staff in these year groups.

➤ **Mathematical dialogue**

The National Curriculum states that learners of all ages should:

"reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language".
(DfE, 2013)

Evidence indicates that high-quality talk in maths plays a significant role in supporting learning. (EEF 2022). From Year One to Year Six, children establish clear expectations for maths talk in their classrooms and create a 'code of conduct'. Teachers have created quality talk question stems; these are in the children's maths books and on display in the classroom. These are referred to during mathematical talk opportunities, such as when problem solving, and they are used to promote debate, respectfully challenge and provide support for others. Children deepen their mathematical dialogue as they are challenged to prove and justify their thinking to others, using accurate mathematical vocabulary, as well as ensuring their method is the most efficient.

➤ **Attitudes to maths**

Maths has a high-profile in school and, as with all subjects, is treated with enthusiasm and positivity by all staff. Children's confidence and enjoyment is of the utmost importance. We recognise that research demonstrates a child's attitude towards maths is inextricably linked to their outcomes*

and so, mindful of the importance of maths in every child's life, we work hard to foster enjoyment and 'emotional satisfaction'* for all involved. At Berkswich, we continually strive to develop resilient learners in a culture whereby mistakes are expected and a natural process to learning. Our approach encourages children to use curiosity and grit to drive their learning ever-forwards.

Teachers have received high quality CPD to foster this resilience and independence when children tackle increasingly challenging problems through the use of toolkits (EEF, 2022). These require children to make meaningful connections to prior learning so that problem solving is approached logically. This also aids the understanding that maths is an interconnected subject and children can move fluently between mathematical ideas.

(*research by Boaler 2007 and Haylock 2018 respectively)

➤ **Teacher knowledge**

Mathematics is a core subject in the National Curriculum and teachers ensure that they have an excellent knowledge and understanding of the Programmes of Study (see www.berkswichceprimary.co.uk for each year group's curriculum content). To support teacher knowledge, we have adapted the White Rose maths mastery scheme of work. Teachers have access to the scheme of learning and videos for every lesson on the White Rose resources to develop subject knowledge, vocabulary and pedagogy. Other resources, including those from Ten Town, Times Table Rock Stars, Third Space and NCETM are used to ensure that teachers deliver a curriculum that is of the highest quality. Teachers are also supported through the expertise of the maths lead who delivers whole school and individualised CPD.

➤ **Learning sequence, pace and repetition**

A detailed, structured curriculum is mapped out across all phases, ensuring continuity and supporting transition between year groups. The curriculum coverage is designed in relatively small, carefully sequenced steps, which are mastered before pupils move to the next stage.

Teachers know their children's prior learning (outlined in the White Rose scheme of learning), and are mindful of their own end points in relation to the expectations contained in subsequent years. Long-term plans logically sequence units across the year. Term by term objectives ensure that the appropriate content is covered in each year group to maintain pace and ensure that learning is progressive over the years and there is additional time each term for children to consolidate their learning. Even when the focus in a unit is, for example, addition, the expectation is that learning will continue to relate to other areas of maths, such as measurement.

Fluency comes from deep knowledge and practice. Pupils work hard and are productive. Within daily lessons, children are challenged to recall and use maths used earlier in the term and in previous years. At early stages, explicit learning of number bonds and multiplication tables is important in the journey towards fluency and contributes to quick and efficient mental calculation. Practice leads to other number facts becoming second nature. Children employ many strategies to acquire important number facts, including the use of online sites, such as NumBots and Times Table Rock Stars. The ability to recall facts from long term memory and manipulate them within new contexts is a vital part of maths throughout life.

Children also have daily opportunities to revisit learning from previous weeks and years through the use of Flashback Fours, ensuring that learning is cumulative and stands the test of time; this enables children to have the best bank of knowledge and understanding possible with which to make new and purposeful connections and develop skills.

➤ **The language of maths**

Teachers have high expectations of children in using discussion to further learning. With learning, children are increasingly expected to give precise explanations, using technical and specialist terminology appropriately. Teachers model this practice, using the correct vocabulary within all learning and encourage children to be bold in their use of new and challenging terms. Care is taken to ensure that mathematical words, such as 'mean,' with alternative definitions outside of the subject area, are carefully explored. Vocabulary and sentence stems are explicitly modelled in the scheme of learning for teachers so that vocabulary across the school is accurate and consistent. Sentence stems and quality talk starters allow children to develop the skills of articulating their responses and justifications after this is modelled by the teacher during the lesson input.

➤ **Cultural capital**

Since we appreciate the importance of maths in each child's life, and the impact of maths on future carer choices and the country's economy, we raise the aspirations of our children through the following:

- involvement in STEM provision which connects with industry.
- visits from high school teachers, parents and members of the wider community who have a particular investment in the subject.
- learning which allows children to grow in awareness of future studying and roles which are firmly rooted in maths.
- involvement in mathematical activities within other schools and settings, led by expert teachers.
- knowledge of mathematical history when relevant to current learning or when it will promote a lively and engaging view of maths
- participation in a range of national competitions

➤ **Greater Depth**

Berkswich CE is ambitious for all pupils; challenge is a part of every child's learning. We provide Greater Depth pupils with the opportunity to extend their mathematical thinking through planned opportunities to broaden and apply their learning within contexts of increasing complexity – depth before breadth. Greater Depth pupils also benefit from providing peer support and having to problem solve and articulate their own understanding in order to encourage learning in others.

All children have the opportunity to tackle greater depth learning in order to refine their reasoning and problem-solving skills. This is also a vital part of building mathematical resilience and enjoyment. The chance to question and to innovate are available for every child.

Roles and responsibilities

➤ **Governors**

Berkswich CE Primary has a designated link governor who meets with the maths lead at least once a year to find out about:

- progress towards whole school improvement priorities
- the school's systems for planning units, supporting staff and monitoring progress
- the allocation, use and adequacy of resources

- the attainment and progress of all children
- the children's experiences of maths and attitudes towards the subject

The curriculum governor will report back to the governing board.

➤ **The headteacher will:**

- work with the maths lead
- monitor planning and reviews
- give feedback to teachers following lesson observations
- support staff development through in-service training and provision of resources

➤ **The subject leader will:**

respond to the school vision and curriculum intent to provide a strategic lead and direction for maths in the school. The lead will:

- prepare policy documents, curriculum plans and schemes of work for the subject.
- review changes to the national curriculum and advising on their implementation. Carry out analysis of data needed to inform action planning
- communicate as necessary with the headteacher and the curriculum governor
- raise the profile of maths across school and its significance in the world beyond
- model highly positive attitudes to maths and ambition for all pupils and groups
- remain informed about current research and developments in the subject by attending CPD sessions and being involved in independent research and reading
- help to develop colleagues' expertise in the subject including pedagogy, pace, subject knowledge, attitudes and disseminate relevant information to staff informally and through mentoring, coaching or high-quality CPD as appropriate
- help in creating a culture whereby staff strive to continuously improve practice and subject knowledge
- monitor standards in the subject, through planning and work scrutiny, statistics, quality of teaching and pupil assessments
- manage the acquisition and deployment of resources to enhance the effectiveness of maths teaching within the school
- work alongside members of the senior leadership team in the evaluation and planning of actions related to school improvement planning and target setting
- monitor the learning, teaching and assessment of maths, providing support for staff where necessary.
- ensure the continuity and progression from year group to year group
- advise on the contribution of maths to other curriculum areas, including cross-curricular and extra-curricular activities.
- collate assessment data and set new priorities for the development of maths in subsequent weeks, terms or years as appropriate.
- support parents and home learning through training events and informal discussions

➤ **Class teacher**

The teacher, in collaboration with the subject leader, will ensure that the needs of all children are met. The class teacher will:

- act in accordance with this policy
- lead by example to further develop a passion in children for the subject
- be ambitious for every learner, including SEND and other vulnerable groups.
- take responsibility to strengthen subject knowledge and seek support as necessary

- have a working understanding of the prior learning of children and the needs of subsequent years
- assess children's learning at the end of each unit and each term and complete a reflection grid which will feed into planning and close gaps
- promote effective mathematical dialogue when problem solving to develop reasoning skills
- write and constantly review short-term plans, considering pupils' needs and outcomes
- ensure that planning is effectively paced, progressive and cumulative over the year and that it meets the wider curriculum intent of the school
- use resources with skill, seeking support as necessary
- have weekly rewards to celebrate children's efforts and achievements on TTRS to encourage engagement and spark enthusiasm
- provide samples of maths outcomes or planning to the maths lead when required
- create a rich and stimulating maths environment that promotes learning and independence and celebrates the learning process/outcomes
- provide opportunities for repetition to build long-term knowledge and skills
- guide teaching assistants to ensure that pupils are effectively supported
- monitor the progress of pupils in their class and report this on an annual basis to parents
- reporting any concerns regarding the teaching of the subject to the subject leader or a member of the senior leadership team

➤ SENDCo

The Special Educational Needs Coordinator (SENCo) is responsible for:

- promoting a 'keep up, not catch up' culture
- promote high expectations and enjoyment in the subject
- liaising with the subject leader in order to implement and develop maths throughout the school.
- organising and providing training for staff regarding the maths curriculum for pupils with special educational needs and disabilities (SEND)
- advising staff how best to support pupils' needs to make accelerated progress
- advising staff on the inclusion of mathematical objectives in pupils' individual education plans or early intervention measures by setting SMART targets
- advising staff on the use of teaching assistants in order to meet pupils' needs
- ensuring that SEND pupils have opportunities to tackle greater depth challenges; we believe that reasoning and problem solving enables fluency in turn to be positively impacted

➤ Maths across the curriculum

Maths is taught in discrete lessons; however, it is also a vital part of cross-curricular learning. When beneficial to both subjects, such learning provides further opportunities to show the necessity of maths and mathematical thinking when, for example, analysing, problem solving or investigating. Teachers will often use computing in order for children to learn or apply mathematical concepts through dynamic or interactive means. Please visit the website to view examples of how maths is purposefully taught across the curriculum in all year groups (www.berkswichceprimary.co.uk).

➤ Home school links

We aim to keep the profile and understanding of our approach to maths high. As part of this, our home school links are greatly valued. Parents, family members and carers are encouraged to be

actively involved in supporting children's learning in school in a number of ways. Parent Learning Together sessions are organised to offer further insights into learning in school and the necessity of home learning. Facts requiring instant recall, such as number bonds, multiplication and division tables and measurement conversions, underpin much of the curriculum in school. Homework related to these facts are sent out as homework and we greatly appreciate the role of parents, family members and carers in supporting children at home in their long-term memorisation. Please see the homework policy, the school website and class website pages for further information. Teachers are always happy to discuss and guide home learning.

The impact of our maths curriculum

➤ Assessment

Children in EYFS will be assessed in accordance with the 'Statutory framework for the early years foundation stage', in order to identify a pupil's strengths and identify areas where progress is less than expected. The progress and development of pupils in Nursery and Reception is, therefore, assessed against the Early Learning Goals. For further information about assessment in EYFS, please visit our Early Years area found via the Learning tab on our school website (www.berkswichceprimary.co.uk).

In all other years, throughout the year, teachers will plan on-going assessment opportunities in order to gauge whether pupils have achieved the key learning objectives. Teachers constantly assess the children's understanding, correcting misunderstandings and extending learning throughout lessons. At the end of each unit, children will complete the end of unit White Rose assessment. Teachers are continuously responsive and alter planning and intervention accordingly to ensure progression.

Well-paced, daily assessments are used sensitively to ensure that children retain the understanding and skills related to concepts covered in previous weeks and in previous years. Fuller summative assessments are also used; these take place a little after the relevant unit to ensure that teachers are assessing learning from the long-term memory. Teachers carry out a question level analysis and work with the maths lead, when necessary, to consider the implications of ensure that actions are responsive to individual, group and class needs.

Teachers will make a judgement about the learning of each pupil in line with NC programmes of study. We have chosen to consider the way in which children have met these objectives in relation to the aims of the curriculum (fluency, reasoning and problem solving). These are recorded for each individual on a termly basis - the outcome of which are recorded using O'Track and used to inform future planning.

Assessment, therefore, will be undertaken in various forms, including the following:

- talking to pupils and asking questions
- discussing pupils' work with them
- assessing children's written outcomes against the learning objectives
- pupils' self-evaluation of their work
- analysis of assessments
- data provided by NumBots and Times Table Rockstars and MTC results (Year Four)
- daily flashback assessments
- end of unit assessments (White Rose)
- end of term assessments (NFER)
- end of Key Stage assessments (SATs: Year Two and Year Six)
- multiplication tables check (Year Four)

Parents will be informed about their child's attainment in maths through an end of Autumn term summary report and during a full report in the Summer term every year. This will include information on pupils' attitudes towards the subject. Teachers will also inform parents of their child's progress verbally in Parents' evening meetings with next steps to further their child's learning. Verbal reports can be provided during informal meetings with parents throughout the year in addition to this. The progress of pupils with SEND will be monitored by the SENDCo who will meet termly with parents and teachers.

➤ **Where are we headed?**

Our high-quality maths education provides a foundation:

- for becoming fluent in the fundamentals of mathematics
- to develop the ability to reason and problem solve mathematically with resilience and independence
- to foster a sense of enjoyment, appreciation and a curiosity about the subject which will support an enduring mastery
- for understanding the world now and in the future

This will be evident in our children through:

- a positive view of themselves as a mathematician, valuing the role of maths within their lives and the world in which they live.
- an appreciation of the creative aspects of mathematics and an awareness of its aesthetic appeal.
- increasing fluency in the fundamentals of mathematics so that they recall and apply knowledge rapidly and accurately and use this to develop conceptual understanding.
- an understanding of patterns and relationships within mathematics.
- the ability to use mathematics as a means of communicating ideas.
- the ability to think clearly and logically, with confidence, flexibility and independence of thought.
- the ability and inclination to work both alone and cooperatively to solve mathematical problems.
- developing personal qualities such as perseverance and self-confidence through a sense of achievement and success.
- demonstrating enquiry skills, such as conjecturing relationships, developing an argument and justifying views.
- the ability to use mathematical language to give precise explanations, using technical and specialist terminology effectively, accurately and appropriately.
- demonstrating enjoyment and curiosity of learning through practical activity, exploration, investigation and discussion.
- an ability to seek accuracy and work logically and systematically.
- proficiency in written methods covered, underpinned by sound understanding.
- a commitment to self-learning and a desire and eagerness to continuously improve.
- an awareness of the ways in which they can explore the subject further within higher education and carer choices.

➤ **Spiritual, moral, social and cultural development**

- pupils learn to work effectively with their peers and others, and build positive relationships.

- pupils learn to build their self-confidence through a willingness to accept that mistakes can be used as opportunities to learn.
- pupils learn to reflect on how to deal with challenge and support others who are tackling difficulties.
- pupils develop an understanding of other cultures and develop positive attitudes through appreciating maths approaches or job roles in other societies.

➤ **Equal opportunities**

All pupils will have equal access to the maths curriculum. Gender, learning ability, physical ability, ethnicity, linguistic ability and/or cultural circumstances will not impede pupils from accessing all maths lessons. All efforts will be made to ensure that cultural and gender differences will be positively reflected in all lessons and teaching materials used, including the inclusion of aspirational visitors who work within maths-related roles.

The subject leader will monitor teaching and learning in the subject Berkswich CE, ensuring that the content of the national curriculum is covered across all phases of a child's education. The curriculum governor is briefed to oversee the teaching of maths and meets regularly with the subject leader to review progress.

Monitoring and review

This policy will be reviewed on an annual basis or sooner if necessary by the subject leader. Any changes made to this policy will be agreed by the headteacher and communicated to all teaching staff and the curriculum governor.