

MATHEMATICS POLICY

**Our Vision for Mathematics**

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## What is Mathematics?

### *Mathematics is a creative and highly interconnected discipline that has been developed over centuries, providing the solution to some of history’s most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject. (National Curriculum 2014)*

At St Clare’s we see Maths very much as a multi-discipline, cross curricular, interconnected subject. As much revolves around the discussion about Maths, as it does the completion of calculations. We want the children to see Mathematics as being imperative, exciting and relevant to their world and applicable to everyday life. Mathematics is something that they will need, as they move on through their school life and ultimately to the world of employment. To that end, a high-quality, inter-related and creative Maths experience should be one that develops the children’s ability to think mathematically and one which allows them to apply the tools to which they have been exposed in a variety of ways.

At St. Clare’s the emphasis linked to the new National Curriculum in 2014 is to ensure that all children:

* become **fluent** in mathematics
* **reason** and **explain** mathematically
* can **solve problems** in mathematics and in other cross-curricular subjects: applying mathematics.

This means that children need to be regularly exposed to opportunities involving increasingly complex problem solving which allows them to apply their Maths knowledge. In doing so they should be encouraged to develop an argument and line of enquiry which they can prove and justify using mathematical vocabulary. This includes the ability to break down problems, both routine and non-routine, into a series of steps.

This document is a statement of the aims, principles and strategies for teaching and learning of Numeracy at St Clare’s Primary School. The policy is for information to staff and all others working within the school. It will ensure effective communication between staff, governors and parents and will be reviewed annually as an integral part of the School Improvement Plan.

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# INTENT

It is our aim that all pupils leave St Clare’s with the maths skills necessary for them to not only excel in secondary school but be confident and competent in their use of maths in their everyday lives. Thus preparing our pupils for adulthood, maths also provides our children with opportunities to work individually and collaboratively. We strive to promote a positive mindset towards maths in our pupils. Not only should our children leave us with an excellent understanding of the four operations, develop fluency, knowledge, skills and understanding of numbers and the number system, calculations, solving problems, measures, shape, space, and data handling, but they should be able to apply their knowledge to solve a range of problems, and in a variety of contexts. We want to encourage children to persevere and take risks in their problem solving approach to learning in Mathematics. Whether written or spoken, we want children to confidently present their thinking and reasoning through the use of maths vocabulary, thus enabling them to engage with concepts and build a deep understanding of them. Our use of the White Rose curriculum ensures topics are revisited year on year, allowing us to build on prior knowledge, while our staff’s confidence allows us to deviate from the scheme, adapting lessons, whilst maintaining high expectations for all. We seek to provide all pupils (regardless of ability, gender, SEND or culture) with the opportunity to meet expectations. achieve mastery and consolidate knowledge.

Mathematics is based on the [Early Years Framework](https://assets.publishing.service.gov.uk/media/65aa5e42ed27ca001327b2c7/EYFS_statutory_framework_for_group_and_school_based_providers.pdf) and the [Mathematics Curriculum 2014.](https://assets.publishing.service.gov.uk/media/5a7da548ed915d2ac884cb07/PRIMARY_national_curriculum_-_Mathematics_220714.pdf)

## Early Years Framework

The current Early Years framework was updated in 2020. It states,

*“Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, ‘have a go’, talk to adults and peers about what they notice and not be afraid to make mistakes.”*

There are 2 Early Learning Goals, linked to Mathematics, which require our pupils to:

Number

* Have a deep understanding of numbers to 10, including the composition of each number.
* Subitise to 5.
* Automatically recall number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.

Numerical Patterns

* Verbally count beyond 20, recognising the pattern of the counting system.
* Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.
* Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally

## Mathematics Curriculum 2014

## *New statutory programmes of study and attainment targets were introduced in September 2014 for all year groups. The document is underpinned with the 3 aims of fluency, reasoning and problem solving. There are 9 strands in the New Mathematics Curriculum. Each of the 9 strands has a programme of study overview with a progression map across the year groups. The 9 strands are: Algebra, Fractions, Geometry, Measurement, Number Addition and Subtraction, Number Multiplication and Division, Number Place Value, Ratio and Proportion and Statistics. The National Curriculum sets out year-by-year programmes of study for key stages 1 and 2. This ensures continuity and progression in the teaching of mathematics.*

The aims of the 2014 National Curriculum are for our pupils to:

* Become fluent in the fundamentals of mathematics through varied and frequent practice with complexity increasing over time.
* Develop conceptual understanding and ability to recall and apply knowledge rapidly and accurately.
* Reason mathematically; follow a line of enquiry, conjecture relationships and generalisations.
* Develop an argument, justification and proof by using mathematical language.
* Problem solve by applying knowledge to a variety of routine and non-routine problems. Breaking down problems into simpler steps and persevering in answering.

At St. Clare’s we want our children to

* develop an understanding of number and number notation including number operations, estimation and selecting appropriate methods of calculation in problem solving activities.

### develop understanding of patterns, sequences and algebraic relationships and use them to solve problems.

* develop measuring skills including estimating and apply them.
* recognise and use properties of 2D and 3D shapes, identify them in real-life situations and use them to solve problems.
* collect, record and process data, and to represent and interpret data. making links to the real world.
* develop understanding and application of probability.

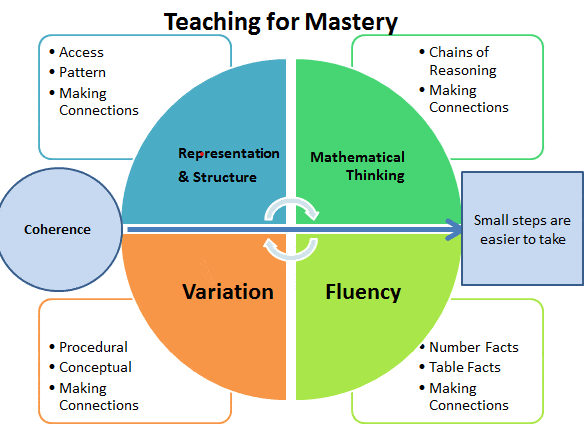
IMPLEMENTATION

Our youngest children begin their early mathematical development of early number sense, giving them the foundational skills needed to confidently reason and solve mathematical problems. The Early Childhood Mathematics Group states,

*“Opportunities for mathematical learning can happen anywhere and should be practical wherever possible.”*

Through play, repetition and exploration in Mathematics, children investigate and experience things, and ‘have a go’. Adults interact with children, helping them to articulate their thinking through talk and demonstration. This interaction with children supports them to learn that mathematical discovery is fun and engaging. Observation of children, provides adults with an insight into their Mathematical understanding and application and informs future learning steps.

### The National Curriculum for Mathematics 2014 and Early Years Framework - Early Learning Goals have been carefully considered in planning the content of our mathematics curriculum. Nursery use Early Years Staffroom / Development Matters (links to WRM) for planning purposes and Reception use NCTEM and WRM. Years 1 to 6, use the White Rose Mathematics scheme alongside some use of NCETM materials, carefully selected by the teacher. These schemes are broken down into small steps and involve fluency, reasoning and problem solving; key aims of the National Curriculum. They support a mastery approach to teaching and learning. They ensure teachers support the ideal of depth before breadth. We consider the ‘5 big ideas in teaching for mastery’



* Coherence
* Representation and Structure
* Mathematical Thinking
* Fluency
* Variation

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### Non-Negotiables

### The following non-negotiables in the teaching of Mathematics have been agreed and established at St. Clare’s

* Ensure clear planning/delivery of each topic and each NC skill through fluency to problem solving activities.
* Use National Curriculum 2014/ ‘Can I’ titles for each focus of work(Y1-6).
* Use calculation policy to ensure correct progression of methods through the key stages.
* Four fluency, problem solving and reasoning lessons per week.
* 15 minutes of Maths Fluency practise per day.
* Assertive mentoring tests once per week(Y1-6).
* Mental Maths Skills assessed, once per fortnight and practises recorded on Football Fluency displays and children’s individual booklets.
* Formatively assess using White Rose Maths tests/Sumdog and NFER Termly tests.
* Working walls display key vocabulary, progression/small steps, methods and problem solving examples and application.
* Children access Sumdog, Times Tables Rockstars and Timestables.co.uk regularly.
* Ensure there are opportunities to apply mathematical knowledge in continuous provision and make appropriate enhancements to support mathematical development.

**Planning**

Planning and preparation ensures that throughout the school children engage in:

* practical activities using a variation of resources/manipulatives
* reasoning and problem solving to challenge thinking
* individual, paired, group and whole class learning and discussions involving key vocabulary and stem sentences to articulate and explain their reasoning and problem solving
* purposeful practise where time is given to apply their learning including open and closed tasks
* a range of methods of calculating and variation in approach e.g. mental, pencil & paper and using a calculator
* working with computers as a mathematical tool
* daily mental mathematics fluency lessons (R-Y6) linked to Football Fluency challenges
* cross-curricular mathematics lessons
* use of Mastering Number in Reception and KS1
* celebrations of maths, involving cross curricular activities, encouraging children to build their confidence and promote a positive ‘can do’ attitude towards the subject, raising the profile and importance of maths in everyday life.

**Mathematics lessons**

Mathematical understanding in EYFS is developed through stories, songs, games, enhancements to continuous provision, child initiated learning and some short bursts of structured teaching. Foundation stage planning for maths emphasises practical activities, play and a commitment to the teaching of basic skills, with some recording by pupils. As pupils progress into Reception, they are encouraged to record their mathematical thinking in a more formal way.

In Key Stage 1 and 2 lessons, the emphasis is to make teaching interactive, to engage all children, encouraging them to talk about mathematics.

Children are introduced to a new concept/skill and explore it having the opportunity to build competency by taking this approach:

# Concrete – children should have the opportunity to use concrete objects and manipulatives to help them understand what they are doing.

# Pictorial – alongside this children should have pictorial representations. These representations can then be used to help reason and problem solve.

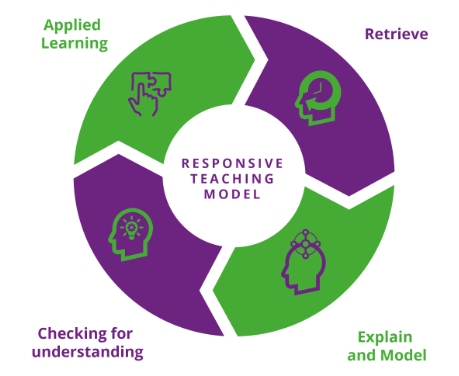
* Abstract – both concrete and pictorial representations should be used to understand abstract concepts.

Children are taught a variety of representations when recording in maths, which are considered over the course of topics and year groups, to avoid cognitive overload (see calculation policies). Children use mental strategies and their own jottings before resorting to more formal written methods.

Children work independently completing fluency questions with further questions as opportunities to enable and extend some pupils, where required. This is followed by more challenging ‘reasoning and problem solving’ work.

Teachers and teaching assistants work around the classroom in all lessons to provide all children with necessary vocabulary, questioning and support to become independent learners and feel confident to have a go at tasks for themselves. This is in line with our ‘Find it, Fix it approach’.

Key vocabulary is visible on Maths working walls and added as new learning arises. Paired talk activities are used and teachers insist that children mirror the language they hear the adults using, to enrich their range of vocabulary. Where appropriate, children are encouraged to answer using stem sentences, Children are required to provide justification and reasoning for their answers and explain their thinking and methods. The idea that there are different methods and ways of approaching problem solving and reasoning is discussed. Children listening to the ideas of others challenges their own thinking. We believe, ‘It’s okay to make mistakes! – that’s when we learn best’.

In line with NPCAT teaching and learning policy, lessons involve elements of: 

* retrieval
* explaining and modelling
* checking for understanding
* applied learning

**Maths Fluency**

Our teaching staff are committed to ensuring that all children achieve the basic skills required to develop a deeper understanding in mathematics. We have distinct fluency sessions to ensure further opportunities for children to become secure in the requisite key skills for his/her year group.

Our pupils' early number sense begins in Nursery. Children from Reception to Year 6 have a 15 minute Maths Fluency session, daily. This is designed to ensure fluent recall of the methods and facts that they need to master, in order to fulfil their relevant year group’s curriculum aims. Our school Football Fluency Challenges, for each year group, provide a focus for these sessions. Reception, Year 1 and Year 2 follow the Mastering Number programme, ensuring children are secure with basic facts and strategies. Football Fluency Challenges begin in Nursery and continue to Y6.

We believe that working together with parents is vital. Parents/carers are encouraged to record each time children have practised challenges at home (using key skills booklets). The programme rewards regular practice both at home and in school, as part of our weekly Achievement Assembly. Children are encouraged to practise with an adult, as regularly as possible.

**Marking and Feedback** [**(Feedback policy)**](https://docs.google.com/document/d/1GjBM4mv6d9SIzB1_AKI8UT5fr5FepHjoGwbM3MzP5fY/edit)

Marking children's work is essential to ensure they make further progress. During Maths lessons in Key Stage 1 and 2, teachers and teaching assistants use live marking to give feedback to pupils, assess knowledge, understanding and application of skills, methods, vocabulary and application. Staff make some comments in books to allow children to correct answers, misconceptions or to challenge a child’s method or understanding.

In Foundation Stage, KS1 and KS2, interaction between the child and the adult is paramount. Teacher-pupil conversations allow pupils to learn new concepts, iron out misconceptions, use key vocabulary whilst discussing methods and problem solving, allowing children to progress. Teachers give feedback to children individually, in groups or whole classes. This may involve further reinforcement during pre and post teaching - ironing out misconceptions or to provide more scaffolding.

Children are encouraged to self-assess their work through marking at different points in lessons, discussing fluency and problem solving and reasoning approaches. This also provides opportunities for children to talk about and listen to different approaches to reasoning and problem solving.

Progression and Continuity

[Addition and Subtraction Calculation Policy](https://assets.whiteroseeducation.com/new-schemes/Addition%20and%20subtraction%20calculation%20policy%20July%202022%20v2.pdf)

[Multiplication and Division Calculation Policy](https://assets.whiteroseeducation.com/new-schemes/Multiplication%20and%20Division%20calculation%20policy%20July%202022.pdf)

[Ready to Progress document.](https://primarysite-prod-sorted.s3.amazonaws.com/bickleighdownchurchofengland/UploadedDocument/d74b54f1-7198-421e-80e4-95f257476432/new-nc-rtp-2022.3-final-march-2023-version.pdf)

**Foundation Stage**

ELG: Number

• Have a deep understanding of numbers to 10, including the composition of each number.

• Subitise (recognise quantities without counting) up to 5.

• Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts)

ELG:

Numerical Patterns

• Verbally count beyond 20, recognising the pattern of the counting system.

• Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.

• Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

**Key stage 1**

* develop confidence and mental fluency with whole numbers, counting and place value.
* working with numerals, words and the four operations, including with practical resources
* develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary.
* use a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.
* know the number bonds to 20 and be precise in using and understanding place value.
* read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

**Key stage 2**

Lower KS2

* fluent with whole numbers and the four operations, including number facts and the concept of place value.
* develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.
* solve a range of problems, including with simple fractions and decimal place value.
* draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them.
* use measuring instruments with accuracy and make connections between measure and number.
* memorised their multiplication tables up to and including the 12 multiplication table
* show precision and fluency in their work.
* read and spell mathematical vocabulary correctly and confidently.

Upper KS2

* extend their understanding of the number system and place value to include larger integers.
* multiplication and division with fractions, decimals, percentages and ratio.
* solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation.
* language of algebra as a means for solving a variety of problems.
* geometry and measures should consolidate and extend knowledge developed in number.
* classify shapes with increasingly complex geometric properties and learn the vocabulary they need to describe them.
* be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages.
* read, spell and pronounce mathematical vocabulary correctly.

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## Special Educational Needs, Inclusion and Equal Opportunities

## In line with the School’s Inclusion Policy, each child has an equal entitlement to all aspects of the Maths curriculum and to experience the full range of Maths activities. Teaching maths for mastery offers all pupils access to the full maths curriculum.

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## Staff have high expectations of all children, irrespective of ability and encourage them to be successful; achieving their full potential. Our aim is to ensure challenge for all. Children are encouraged to have a positive growth mindset about their ability to do mathematics. Encouraging children to ‘have a go’ is seen as paramount. This inclusive approach, and its emphasis on promoting variation in method and resources/manipulatives, builds self-confidence and resilience in pupils. Lessons are planned in order to provide a low-entry, high-ceiling approach to enable all children to progress, without limitation.

## Formative assessment during lessons, provides opportunities for teachers to identify and address misconceptions and gaps in learning, to ensure all children achieve lesson expectations. Staff use the ‘Find it, Fix it approach’ to identify children requiring further support within lessons. Enabling/extending questions and tasks ensure the needs of children not achieving/achieving expectations are addressed. Pre and post teaching is also a strategy used to ensure children achieve expectations.

SEND children have their own support plans/EHCPs with key targets linked to Numeracy and provision.

Class work is further supported through additional intervention programmes for children who have been identified as requiring further help. Plus 1 and Power of 2 interventions are used on a 1:1 basis, for those children identified.

Curriculum materials and resources which are in no way class, gender or racially prejudiced or biased. Girls and boys have equal access to mathematics through daily timetabled lessons.

**Assessment and Reporting**

Mathematics is assessed at St Clare’s using

* marking and feedback(including children’s own marking/self assessment)
* teacher observation/interaction of given tasks.
* informal discussions where pupils are encouraged to appraise their own work and progress.
* specific tests e.g. tables tests, mental arithmetic tests etc.
* Football Fluency Booklets - fluency- facts and methods (Nursery to Y6).
* WRM small steps school traffic light assessment sheet(KS1 and KS2)
* end of block assessments provided by White Rose Maths/Sumdog WRM online assessments(KS1 AND KS2)
* NFER end of term assessments (KS1 and KS2)
* formal baseline tests and checkpoints (beginning, mid-point and year end in EYFS)
* ELG - end of Reception
* Y4 Multiplication Check.
* Y6 SATs tests in Arithmetic, Reasoning and Problem Solving.

Formative Assessment is used to guide the progress of individual pupils in Maths. It involves identifying each child’s progress in each lesson and determining what each child has learnt and what therefore should be the next stage in his/her learning.

Assessments used alongside judgements made from class work and termly NFER maths tests, support teachers in making a summative assessment for each child, on our school Arbor system.

Progress is carefully monitored across the primary school through the NFER analysis tool(Y2-6), our school traffic light maths sheets and Arbor. This provides opportunities to overview individual, group, cohort and whole school attainment.

Reporting to parents is done on a termly basis through consultations with a summary report and annually through a written report. Parents are consulted whenever there is a cause for concern and can approach individual members of staff or the Headteacher at any time throughout the year.

**Resources**

Maths equipment is stored in a central maths cupboard, for whole school access. Each class teacher has a range of maths manipulatives/resources for their year group - with responsibility for the organisation and maintenance of this equipment stored in his/her classroom. Children should be encouraged to choose and use manipulatives available to them in the classroom and which they feel would be beneficial to help them when completing Maths work. If further resources are needed, requirements are passed on to the mathematics lead who may need to prioritise before ordering.

Parent helpers are a valuable resource and are encouraged to come into school.

**Continuing Professional Development**

Staff at St Clare’s are given access to CPD in Mathematics through regular staff meetings/PD days outlining new strategies and ideas, looking at coverage and progression of Mathematics within school and new areas of interest outlined by the Mathematics Lead. The Mathematics Lead attends regular courses to keep up-to-date with new advances in Mathematics and is part of a White Rose Maths Hub - Sustaining Group and Maths leads within the NPCAT trust. This new learning and knowledge is disseminated amongst teachers and teaching assistants accordingly. Staff are also invited to take part in their own CPD linked to mathematics as courses become available and through CPD, identified during observations. Peer observations provide staff with opportunities to watch and discuss lessons and share good practice within school. Teaching staff also visit other schools across the academy to share and learn about good practice. These take the form of TRG whereby staff develop their own confidence and teaching, having observed and discussed lead maths teachers in other NPCAT schools.

It is important that parents and carers are actively involved in the children’s education. In order to help keep them informed of what is happening within school we have run parent information sessions/maths mornings and provide updates through letters and having an open door policy. Parents are informed about assessment/testing arrangements within Years 2, 4 and 6.

**Responsibilities**

***Role of the Mathematics Lead***

* To take the lead in policy development to ensure progression and continuity in Mathematics throughout the school.
* To offer support and advise colleagues in their planning.
* To provide staff with CPD opportunities in relation to maths within the confines of the budget and the School Improvement Plan.
* To monitor the Mathematics budget and take responsibility for the purchase and organisation of resources for Mathematics.
* To keep up to date with developments in Mathematical education and disseminate information to colleagues as appropriate.
* To monitor the effective use of schemes of work.
* To keep abreast of and monitor assessment and recording arrangements.
* To analyse data and its implications for new initiatives and developments in teaching and learning.
* To lead new initiatives and assess their impact on teaching and learning.
* To produce, deliver and monitor a detailed Intent, Implementation and Impact statement through writing the school action plan for Mathematics.
* To liaise with the Mathematics governor.

***Role of Class Teacher***

* To ensure progression of Mathematical skills.
* Develop skills, knowledge and understanding of Mathematics.
* Identify own training needs and disseminate to Mathematics Lead.
* To keep ongoing assessment records, both summative and formative.
* To provide written and verbal feedback through daily Mathematics lessons, instilling confidence and encouraging future independent learning for pupils.
* To plan as directed by Mathematics lead/SLT.
* To provide resources to enable all children to access the Mathematics Curriculum.
* To display a mathematics working wall to retrieve, reinforce and scaffold new learning.
* To inform parents of pupils’ progress, achievements and attainment.
* Regularly assess children’s mental maths recall through Football Fluency Booklets.

***We encourage Parental involvement through***

* practising key skills with children, using Football Fluency books..
* informing parents via termly curriculum overviews.
* sending home end of year reports.
* encouraging parents to come into the classrooms.
* holding parental consultation evenings/workshops focusing on areas of Mathematics when necessary.
* asking parents to support homework/Mental Maths recall.

***Mathematics Governor***

* Liaise with the Mathematics lead and be aware of developments within the teaching and learning of Mathematics in school.
* Know of future training and developments for staff and children in school through our action plan.
* Be aware of the Mathematics budget and its use.
* Be familiar with assessment, attainment and data for Mathematics within school.

**IMPACT**

At St Clare’s, we strive for all pupils to achieve their full potential and this is reflected in our pupil outcomes at each phase. Our pupils achieve highly, and make good progress from starting points. Early number sense and fluency lessons provide a strong grounding for future learning. Teachers promote a positive attitude towards maths and have high expectations of all pupils, providing challenge and engagement through quality teaching and learning using small step sequences. Children are supported to develop both collaborative and independent skills as well as developing a positive growth mindset towards Maths. Children use maths vocabulary confidently when discussing maths and approach reasoning and problem solving, with confidence and resilience. A range of assessment, monitoring and moderation is undertaken, as well as intervention, to ensure the success of all children. As a result, high standards are maintained and results are seen in outcomes for all pupils which are above national average.

**Other policy/document links**

Addition and Subtraction Calculation Policy

Multiplication and Division Calculation Policy

Teaching and Learning Policy

Marking and Feedback Policy

Ready to Progress Document WRM

**Policy updated: February 2024**

**Policy to be reviewed: February 2025**

**Subject leader: Miss M Callaghan**