

St Thomas' C.E. Primary School

Maths Policy



INTENT

Purpose of Study

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.

Intent from Subject

The curriculum at St Thomas C.E. Primary school is designed to provide a broad and balanced education that meets the needs of all children. It provides opportunities for children to develop as independent, confident and successful learners, with high aspirations, who know how to make a positive contribution to their community and the wider society. The curriculum ensures that academic success, creativity and problem solving, reliability, responsibility and resilience, as well as physical development, well-being and mental health are key elements that support the development of the whole child and promote a positive attitude to learning. The curriculum celebrates the diversity and utilises the skills, knowledge and cultural wealth of the community while supporting the children's spiritual, moral, social and cultural development, ensuring that children are well prepared for life in modern Britain.

At St Thomas' C.E. Primary, we take a mastery approach to the teaching and learning of Mathematics. Essentially, our ethos is that all children can be successful in the study of mathematics. We do not accept that 'some children cannot do maths' or that children should be limited by prior attainment. Maths is for everyone! We teach the skills to ensure our children are resilient learners who become life-long Mathematicians. We aim to deliver an inspiring and engaging Mathematics curriculum through high quality teaching. In order to improve our mastery approach and improve the quality of our maths teaching, we have implemented the Power Maths approach this year.

The Power Maths approach enables children to be numerate, creative, independent, inquisitive, enquiring and confident. Children should not be afraid to make mistakes and should fully embrace the fact that mistakes are part of learning! A mastery curriculum promotes a deep, long-term, secure and adaptable understanding of the subject, so that

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children become fluent in calculations; possess a growing confidence to reason mathematically and hone their problem-solving skills.

The intention of the Maths curriculum at St Thomas' is for children to be excited about Maths! Developing a positive attitude to this subject is essential. Teachers promote children's enjoyment of Maths and provide opportunities for children to build a conceptual understanding of Maths before applying their knowledge to everyday problems and challenges. We ensure that challenge is provided for all children, whatever their understanding. Children are encouraged to be brave and push the boundaries, deepening their understanding further.

The only way to learn Mathematics is by doing Mathematics!

Aims from National Curriculum

The national curriculum for mathematics aims to ensure that all pupils:

- 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 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 persevering in seeking solutions

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

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IMPLEMENTATION

Teaching & Learning

Organisation and Curriculum Coverage

At St Thomas', we recognise that children need to be confident and fluent across each yearly objective. To ensure consistent coverage, teachers follow the Power Maths scheme of learning to support their planning. Teachers are also developing their understanding of mastery whilst working within the Maths Hub and regular in house CPD. Power Maths is an exciting and inspiring class mastery approach, which has been recommended by the Department for Education.

Every year group has a daily Power Maths lesson. For most children, this is an hour long. For younger children the lesson is shorter. The children also have fluency lesson which focus on consolidating gaps and accelerating progress which can then be applied in different contexts. Every Power Maths lesson is divided into sections that involve plenty of discovery, sharing, thinking together, practice and reflection.

Children begin with a short 'Power Up' activity which supports fluency in and recall of number facts. Following this, the main lesson begins with a 'Discover' and 'Share' task in which a contextual problem is shared for the children to discuss in partners. This helps promote discussion and ensures that mathematical ideas are introduced in a logical way to support conceptual understanding. In KS1, these problems are almost always presented with objects (concrete manipulatives) for children to use. Children may also use manipulatives in KS2. Teachers use careful questions to draw out children's discussions and their reasoning and the children learn from misconceptions through whole class reasoning.

Following this, the children are presented with varied similar problems which they might discuss with a partner or within a small group. At this point, scaffolding is carefully reduced to prepare children for independent practice. This is the 'Think together' part of the lesson and the children might record some of their working out in their Maths books or on a mini whiteboard. The teacher uses this part of the lesson to address any initial errors and confirm the different methods and strategies that can be used. The children are then shown a 'challenge' which promotes a greater depth of thinking.

The class then progress to the 'Practice' part of the lesson, which is designed to be completed independently. This practice uses conceptual and procedural variation to build fluency and develop greater understanding of underlying mathematical concepts. A challenge question and links to other areas of Maths encourages children to take their understanding to a greater level of depth. Children who complete this are provided with further 'rich and sophisticated' problems from the deepening tasks.

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The final part of the sequence is a 'reflect' task. This is an opportunity for children to review, reason and reflect on learning and enables the teacher to gauge their depth of understanding.

Children are encouraged to solve problems each day through the use of concrete resources, pictorial representations and abstract thinking. Each child has their own Practice Book in which they answer questions and discuss their thinking with their teacher.

At the heart of this programme is the idea that all children can be successful mathematicians with the right mind-set. Children learn alongside five characters, each with different mathematical characteristics. These characters are:



High quality resources are used in conjunction with Power Maths, such as NRich and NCETM to support, stretch and challenge all children within the classroom. In addition, the school's calculation policy is used to ensure a coherent approach to teaching the operations across our school.

Our curriculum builds on the concrete, pictorial, abstract approach. By using all three, the children can explore and demonstrate their mathematical learning. Together, these elements help to cement knowledge so children truly understand what they have learnt.

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All children have access to a wide range of concrete Mathematical resources to help them build on their concrete understanding of Mathematical concepts.

All children when introduced to a new concept for the first time are encouraged to physically represent mathematical concepts. Objects and pictures are used to demonstrate and visualise abstract ideas, alongside numbers and symbols. Throughout Roby Park, you will see these three methods being used:

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

Pictorial – children then build on this concrete approach by using these pictorial representations, which can then be used to reason and solve problems.

Abstract – with the foundations firmly laid by using the concrete and pictorial methods the children can move onto an abstract approach using numbers and key concepts with confidence.

Teachers teach Maths using the online interactive tool, enabling them to model pictorial and abstract concepts which children can replicate and apply to their own learning.

Children practise chanting their times tables at the beginning of every Maths lessons and children from Y3 onwards are expected to chant up to, and including, their 12 times tables. All children (from Y1-Y6) have access to Times Table Rock Star <https://play.ttrockstars.com/auth/school>. Children are practice their times tables (and the inverse) under timed conditions daily, similar to those they will tested under in the national Year 4 Multiplication Tables Check from Summer 2022.

Resources

The use of Mathematics resources is integral to the concrete – pictorial – abstract approach and thus planned into teaching and learning. The school has a wide variety of good quality equipment and resources, both tangible and ICT based, to support our learning and teaching.

These resources are used by our teachers and children in a number of ways including:

- Demonstrating or modelling an idea, an operation or method of calculation. Resources for this purpose would include: a number line; place value cards; dienes; place value counters and grids; money or coins; measuring equipment for capacity, mass and length; bead strings; the interactive whiteboards and related software; 3D shapes and/or nets; Numicon and related resources and software; multilink cubes; clocks; protractors; calculators; dice; number and fractions' fans;

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individual whiteboards and pens; and 2D shapes and pattern blocks, amongst other things

- Enabling children to use a calculation strategy or method that they couldn't do without help, by using any of the above or other resources as required

Standard resources, such as number lines, multi-link cubes, dienes, hundred squares and counters are located within individual classrooms. Resources within individual classes are accessible to all children who should be encouraged to be responsible for their use.

An interactive teaching tool for the purpose of modelling strategies is available to all teachers as part of the Power Maths scheme. Resources to support teachers' own professional development and understanding of new approaches as part of a mastery approach are available on the Power Maths 'activelearn' platform. As well as overviews of learning, these include short videos which demonstrate new methods to ensure accuracy.

High quality textbooks and practice books, approved by the DfE, as part of the national approach to teaching for mastery are used in each year group and a digital version of the Power Maths textbooks allows these to be shared with the class, during the main teaching. Teachers are encouraged to use the school playgrounds as an outdoor classroom when possible, for example, when teaching length, area or perimeter.

EYFS

Children have a short daily Maths teaching session, during which time they begin to develop their understanding of simple mathematical concepts such as counting to 20, maintaining 1 to 1 correspondence, simple addition and subtraction facts, to recognise and describe simple 2d and 3d shapes. Children are taught these concepts using physical resources, pictorial resources, songs, games and role-play.

In Reception, children have a three part lesson from Autumn 1. This consists of:

1. Whole class oral and mental starter - 5 minutes
2. Whole class main teaching - 10 minutes
3. Focus activity for 8 children, grouped according to current attainment and taught in a ratio of 2 or 3 children to 1 adult

Throughout the week a child will work with an adult - either a teacher or a supporting adult -

on a differentiated task. This activity is completed in 10 - 15 minutes.

This structure to the lesson enables teachers to secure a good balance between whole class work, group teaching and individual practice. It also enables teachers to establish regular routines thereby maximising teaching time. It supports assessment on a daily basis,

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as well as individual feedback to children, ensuring that children receive immediate intervention as required during the supported focus activity.

In Reception, the independent activities at the Maths table link to the focus for the week. For example, if the focus for the week is addition, then activities on the Maths will often link to this. In addition to these planned independent activities, children also have the opportunity to self-select Maths resources to consolidate their learning during child initiated activities. We recognise the importance of play-based learning and therefore encourage children to develop their understanding during their play. Such opportunities are provided in both the inside and outside environment.

Regular observations and assessments help to ensure that children that need additional intervention to consolidate their mathematical understanding are identified and supported by appropriate interventions.

Home learning

Home learning is available via Times Table Rock Star and Numbots.

Displays

Each class is expected to have an up to date Maths working wall, which changes each lesson, modelling the concrete > pictorial > abstract Mathematical concepts. Unit vocabulary should also be up on displays and changed when a new unit starts.

A Whole school Maths display will be produced in the corridor showing progression across the school.

Presentation

Handwriting and presentation is a whole school priority and the highest standards are expected across the curriculum. Children will be reminded in all lessons of handwriting and presentation expectations. Staff will model the expectations throughout the curriculum.

Planning

All planning should be readily available in planning folders. Power Maths plans should be dated, printed and annotated, planning specifically for pupils in the class. Annotations should include evaluations of lessons to inform assessment.

Power Maths interactive tool and resources should be used throughout all lessons to ensure high quality delivery.

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Plans should be available from the beginning of the week, should anyone need to take your class.

Cross Curricular Links

Teachers plan strategically to take advantage of opportunities to make cross-curricular links. They will plan for pupils to practise and apply the skills, knowledge and understanding acquired through Maths lessons to other areas of the curriculum. They will also use their long term planning to make the best use of fitting in appropriate units to coincide with topic plans. Special visitors are booked to enrich the curriculum in an interesting way.

Application of Mathematics across the curriculum is ongoing.

Examples of cross curricular learning could include:

Department	Mathematical content
Art	Symmetry; other transformations; paint mixtures as a ratio
Geography	Representing data; finding averages; use of spreadsheets
History	Timelines; sequencing events
Digital Literacy	Collecting and representing data
MFL	Dates; counting in other languages
PE	Collecting real data; timing; measuring
Science	Formulae; calculating means and percentages; calculating with positive, negative and decimals; substitution; rearranging formulae; collecting and representing data.
DT	Measurement; properties of shape; scaling and ratio.
English	Identifying important information in a text will help them to better understand problem solving questions.
Music	Sequencing

Inclusion

Equal Opportunities

The school is committed to ensuring the active participation and progress of all children in their learning.

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All children will be given equal opportunities to achieve their best possible standard, whatever their current attainment and irrespective of gender, ethnic, social or cultural background, home language or any other aspect that could affect their participation or the progress of which they are capable.

British Values

Children will have opportunities to:

SMSC

Spiritual Education

- Use imagination and creativity to explore ideas while learning mathematics by: identifying and applying patterns and rules to everyday problem-solving; writing own problems and challenges that use those patterns or rules.

Moral Education

- Understanding the consequences of actions: Eg. If you perform a particular action to one number, will the same outcome apply to other numbers? Is it always the case? 'Sometimes, always, never' statements.

Social Education

- Developing personal qualities and using social skills: Working in pairs or groups to solve problems;
- Perseverance when struggling to answer questions; not being afraid to try – it's ok to be wrong, it's not ok not to try; taking turns when playing maths games.
- Participating, co-operating and resolving conflicts: as above, but also 'X thinks ____, Y thinks ____, who is right?' type questions.

Cultural Education

- Understanding and appreciating personal influences: taking into account other people's views and understanding how to express own views. Eg. How to explain to someone where they may have gone wrong in a question.

BRITISH VALUES

Democracy

- Take into account the views of others in shared activities. Voting when collecting data.

The Rule of Law

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- Undertake safe practices, following class rules during tasks and activities for the benefit of all.
- Understand the consequences if rules are not followed.

Individual Liberty

- Work within boundaries to make safe choices during practical activities. Make own choices within data handling activities.

Tolerance of those with different faiths and beliefs

- Use maths to learn about different faiths and cultures around the world. Eg. looking at patterns/shapes within Islam / Hindu religions.

Mutual Respect

- To behave appropriately, allowing all participants the opportunity to work effectively.
- Take turns and share equipment.
- Review each other's work respectfully.
- Work collaboratively on projects/problems, help and advise others

Enrichment Opportunities

At St Thomas', we believe that children learn best when they are engaged, inspired and motivated to learn. We offer a wide range of experiences and challenges that enrich our core curriculum. This allows our pupils to learn outside the classroom and develop the skills for the world beyond the primary education. Below are some examples of how we achieve this through:

- Educational visits, workshops and residential trips – art galleries and museums
- Fundraising and awareness days – Harvest/food banks, Macmillan Coffee Mornings, , Christmas Jumper Day, Reindeer Run for Springhill Hospice
- 'Keep safe' curriculum – Bikeability, Friendship Week, Road Safety, Bonfire Night safety, Internet Safety, Global Policing Workshops, NSPCC workshops
- Wider opportunities –,Musical Instruments, Extra-curricular club offer
- Sporting events – inter and intra competitions with the collaborative schools and RSGP
- Collaborative events with local schools
- Festivals, celebrations and performances – Musical concerts, Pantomimes, Christmas productions, Easter celebrations, class assemblies

Community Links

The subject leader's role is to develop links with our community, to invite members of the community into school for special events and celebrations and to organise school community events.

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Wellbeing

At St Thomas', we are committed to supporting the positive mental health and wellbeing of our whole school community (children, staff, parents and carers). We recognise that mental health and emotional wellbeing is just as important to our lives as our physical health.

At St Thomas', we endeavour to ensure that children are able to manage times of change and stress. We ensure that children learn about what they can do to maintain positive mental health, what affects their mental health, how they can help reduce the stigma surrounding mental health issues, and where they can go if they need help and support. The promotion of positive wellbeing is woven throughout our curriculum.

IMPACT

Impact

The innovative practice across the school provides a strong foundation and opportunities for children to collaborate and develop social skills both indoors and out. This curriculum design ensures that the needs of individual and small groups of children can be met within the environment of high quality first wave teaching, supported by targeted, proven interventions where appropriate. In this way it can be seen to impact in a very positive way on children's outcomes.

Enjoyment of the curriculum promotes achievement, confidence and good behaviour. Children feel safe to try new things. High quality visits and visitors to the school enhance the curriculum and provide opportunities for writing for a purpose.

The school has a supportive ethos and our approaches support the children in developing their collaborative and independent skills, as well as empathy and the need to recognise the achievement of others. Children can underperform in Mathematics because they think they can't do it or are not naturally good at it. The Power Maths programme addresses these preconceptions by ensuring that all children experience challenge and success in Mathematics by developing a growth mindset. Regular and ongoing assessment informs teaching, as well as intervention, to support and enable the success of each child. These factors ensure that we are able to maintain high standards, with achievement at the end of KS2 well above the national average and a high proportion of children demonstrating greater depth, at the end of each phase.

Children have opportunities to share their learning with each other, their parents and carers and other learners through school-based and external exhibitions, performances, competitions and events involving other schools. Developing their independence and

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motivation as learners and their sense of responsibility as future citizens is at the heart of all our teaching and learning.

Assessment

Children receive effective feedback through teacher assessment and AfL is integral to the design of each lesson;

- The structure of the teaching sequence, ensures that children know how to be successful in their independent work. Guided practice, which takes place within the 'Think Together' part of the lesson, provides further preparation for children to be able to apply the skills, knowledge and strategies taught during the 'Discover and Share' phase. Common misconceptions are addressed within the teaching sequence and key understanding within each 'small step' is reviewed and checked by the teacher and the children before progression to further depth.
- At the end of the lesson, the children review their work and self and peer assessment are used consistently as outline by the school's 'Marking and Feedback Policy'.
- The children's self-assessment is reviewed by the teacher during review of the children's work to inform where consolidation might be required. Opportunities for additional practice and correction are provided by the teacher, as appropriate, during marking, with a focus on promoting and achieving a growth mindset within the subject.

Formative assessment

Short term assessment is a feature of each lesson. Observations and careful questioning enable teachers to adjust lessons and brief other adults in the class if necessary. The lesson structure of Power Maths is designed to support this process and the reflect task at the end of each lesson also allows for misconceptions to be addressed.

Summative assessment

At the end of each blocked unit of work, the children also complete the 'End of Unit Assessment'. The outcome of this is used by the teacher to ensure that any identified gaps in understanding can be addressed before the next unit is taught.

Teachers administer a termly Power Maths progress test which tests arithmetic, reasoning and problem-solving which specifically links to the coverage for that term. The results of these papers are used to identify children's ongoing target areas, which are communicated to the children, as well as to parents and carers at Parents Evening. They are also used alongside the end of unit assessments and outcomes of work, to inform the whole school tracking of attainment and progress for each child. These scores are put into the FFT Aspire tracker. This will allow SLT to analyse the data and track the children across their school career.

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Each week children complete an age related arithmetic text to give them the opportunity to practise fluency skills recently consolidated. Scores should be uploaded to Insight.

Assessment data in maths is reviewed throughout the year to inform interventions and to also ensure that provision remains well-informed to enable optimum progress and achievement. End of year data is used to measure the extent to which attainment gaps for individuals and identified groups of learners are being closed. This data is used to inform whole school and subject development priorities for the next school year.

Children's attainment, progress and barriers to learning will be discussed in half termly Pupil Progress Meetings with senior leaders and clear actions to work on will be planned together, to support pupils and staff in closing gaps.

Monitoring and Evaluation

Subject leads play an active role in the school self-evaluation cycle and throughout the year they will participate in:

- Ensure there is clear progression throughout the school
- Creation of termly data reports
- Reporting to SLT & Governors
- Pupil voice
- Work samples
- Learning exploration blinks
- Developing cultural capital opportunities and events
- Identify any training needs and offer extra support and guidance to staff when it is appropriate
- Ensure that there are suitable resources to help with the teaching and learning of their subject

Review Date

Policy Agreed: July 2021

Policy Review: July 2023

This policy needs to read in conjunction with:

- **The SEND policy**
- **Marking policy**
- **Presentation policy**
- **Calculation Policies**
- **Year Group Maths Vocabulary lists**
- **Power Maths Teaching sequence**

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