

Tilston Parochial CE Primary School

Bringing out the Best in Everyone.

'Encourage one another and build each other up.' Thessalonians 5:1



Tilston Parochial
CE Primary School

Maths Policy

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Approved by: Achievement and Safeguarding Committee
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Intent

'Nature is written in mathematical language' - Galileo Galilei

'Mathematics is, in its way, the poetry of logical ideas' – Albert Einstein

At Tilston Parochial CE Primary, we believe mathematics is a tool of everyday life rather than memorised facts and procedures which can easily be forgotten and can lead to superficial understanding.

We aim to equip our children to be curious about mathematics, to seek out and identify connections and patterns between concepts and to reason mathematically. By underpinning our maths curriculum with these mathematical habits of mind, we hope to help our children become resilient and discover the benefits of persevering.

We endeavour to arm our children with a rich mathematical vocabulary (outlined in appendix 3) so they become confident communicators and are able to explain not only *what* they are doing by *why*. By doing so, we aim to foster analytical minds with skills they naturally apply across the curriculum, rather than thinking of mathematics as a distinct entity.

Our curriculum encourages our children to fill their 'maths toolkit' with a variety of methods and approaches for tackling mathematics. As a result they can choose and select the most effective method for themselves in different scenarios. At the heart of our teaching is the belief that all children can achieve in mathematics. That there is no such thing as a 'maths person', but rather with the right building blocks and opportunities we ensure we 'bring out the best' in each and every one of our mathematicians.

Implementation

'The only way to learn mathematics is to do mathematics.' - Paul Halmos

'Millions saw the apple fall, but Newton asked why' – Bernard Baruch

Through the implementation of our mathematics curriculum, we uphold and nurture the following underlying principles for the teaching and learning of mathematics.

We aim to ensure that all children:

- Become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual and procedural 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, e.g. "Convince me that..." or "I know that.... So"
- 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.
- Be confident to use and understand **mathematical vocabulary** as a means to decipher what is being asked as well as a tool to explain and justify their thinking.

To achieve these aims our curriculum is implemented through the **Concrete, Pictorial, Abstract** (CPA) teaching sequence.

Concrete – children have the opportunity to use concrete objects and manipulatives to help them understand and explain what they are doing. A range of age appropriate resources are available in each classroom and the children are taught how to use these to help them 'see' the maths they are doing. The children are then encouraged to choose the manipulative that best helps *them* to complete their maths.

Pictorial – children then build on this concrete approach by using pictorial representations, which can then be used to reason and solve problems. We remind our children that drawing a maths picture (such as a place value chart or array) can help them unpick or simplify a question.

Abstract – With the foundations firmly laid, children can move to an abstract or 'symbolic' approach using numbers and key concepts with confidence.

For the children, this approach is referred to as 'using our maths MICE'. This acronym (Manipulatives, Illustration, Calculation, Explain) provides our children with a memorable and purposeful tool to help them tackle their maths. Like Newton questioning why the apple fell from the tree, at Tilston we want our children to question 'why'. We believe that ensuring our children can explain their thinking and prove to themselves why something works, rather than merely accepting what they are told, builds strong mathematical foundations for all future learning.

This CAP approach is central to our planning and teaching sequences.

Planning

At Tilson, we use White Rose Maths schemes of learning and resources to plan our teaching sequences. White Rose is based on a small steps approach that keeps all learners together. By using the resources across the school from Reception to Year 6, we seek to ensure consistency, progression and comprehensive coverage of the curriculum across the inevitable ability range within each year group. By incorporating the CAP model, it is designed to support mathematicians who require more time and visual representation to grasp fundamental concepts and those who require challenging further to achieve Greater Depth.

Teachers use the following approach and documents to support the planning of mathematics across the school.

Long term plans: National Curriculum 2014, White Rose Maths mixed age yearly overviews (see appendix 1), and NCETM Mastery Documents.

Teachers use the National Curriculum objectives and as a starting point for planning, supported by the White Rose Mixed age yearly overviews which have been amended to reflect Tilson's timetable and teaching commitments. This ensures curriculum coverage and that sufficient time is given to teaching the knowledge in each mathematical unit. NCETM Mastery documents are reviewed and used throughout the planning cycle to make sure appropriate opportunities are provided for our children to reach mastery and greater depth standards.

Medium/short term plans: DfE Mathematics guidance 2020, White Rose Maths small steps teaching sequences and Tilson's Calculation Policy (see appendix 2).

For each unit teachers plan from the White Rose Small Steps and each year group's specific guidance outlined in the DfE Mathematical guidance 2020. The order in which the small steps are taught is based on the teacher's discretion to ensure a logical progression and the needs of each mixed aged cohort is met. Teachers ensure that the 'ready to progress' criteria outlined in the DfE Mathematics guidance 2020 are used to inform planning. Our calculation policy is used to ensure appropriate progression across the school for each calculation method, (namely addition, subtraction, multiplication and division).

Ongoing plans are generated on a week by week basis, taking into consideration the needs of our children. Each lesson includes a clear learning objective and success criteria in the form of 'steps to success'. By using White Rose resources, a week of learning includes an appropriate mixed of **fluency, reasoning and problem solving**. In addition, teachers refer to the NCETM reasoning progression matrix (appendix 4) and include Nrich (or similar) activities where appropriate

Throughout the planning cycle teachers ensure our children have opportunity to use and develop the following mathematical skills:

- Working systematically
- Thinking strategically
- Posing questions and making conjectures
- Exploring and noticing patterns
- Justifying, convincing and proving

As part of our planning cycle, the concept of 'keep up not catch up' is central. Across the school, daily afternoon interventions are used for *any* child who has found a specific area of mathematics challenging. These interventions are used to give the opportunity to practise the concept with additional support and address misconceptions before learning continues the next day. In this way our children are ready to progress their learning rather than compounding uncertainty and confusion.

Differentiation

Through differentiation in planning, we aim to provide for the individual needs of each and every child. Learning opportunities are matched to the capabilities of all pupils, with support given where necessary. Challenge for the more able is provided through variance in teaching style, outcome and independence in the direction of learning.

Practically this may be achieved through:

- Stepped activities – activities which become more difficult and demanding but cater for all in the initial sections. This approach is built into the White Rose resources.
- Common tasks – activities which are open ended tasks/investigations where differentiation is by outcome based on the depth of the answer provided and evidence of mathematical thinking and vocabulary used.
- Resourcing – a variety of resources and manipulatives are provided to match ability. These resources help our children to access the task given and the CPA sequence at the appropriate level.
- Level of support- children may work in adult lead small groups to support their learning.

Providing challenge

Children who are identified as working at a Great Depth would consistently be expected to complete the penultimate and final questions of the White Rose resources as these are intended to challenge and require deeper reasoning and understanding. In addition, separate challenges or extension activities are provided either as a follow on activity or as a separate teacher lead activity. These activities are identified within books by using green paper for the learning objectives and activities.

Special Educational Needs (SEN)

Quality first teaching is our first approach to the needs of any child. Children who have been identified with a SEN are set termly targets within their education plan. Work towards these targets take place during their maths lesson or through separate interventions in addition to maths lessons. These sessions may be delivered by the teacher or teaching assistant and may involve individual children or small groups.

Impact

'The study of mathematics, like the Nile, begins in minuteness but ends in magnificence' – Charles Caleb Colton

The impact of our curriculum is measured through a variety of assessment tools. These seek to ensure our children have mastered the mathematical concepts taught, as well as evidencing mathematical thinking and habits. A mathematical concept or skill has been *mastered* when a child is able to:

- show how they arrived at an answer or solution in more than one way;
- using mathematical vocabulary to explain their ideas; and
- independently apply the concepts to new problems in unfamiliar situations.

Formative assessments are made daily through effective assessment for learning throughout each lesson, as well as on the spot marking and timely marking (in line with the school's marking policy).

Throughout a unit of work, teacher will set tasks or activities based on the NCETM Mastery document for the appropriate year group, as a means of assessing mastery and greater depth. In addition, teachers consult and apply the 'ready to progress' criteria found within the DfE Mathematical Guidance 2020 document (appendix 5). These assessments are supported by the use of White Rose end of term assessments as appropriate.

Children's achievements are updated on a termly basis by class teachers on Insights. This data is reviewed and discussed with the Headteacher during termly pupil progress meeting to identify those children who are not making the expected progress. This data is shared with, and tracked, by the Subject Lead.

Summative assessments are made during the summer term. Year 2 and 6 are assessed through SATs and the remaining year groups complete NFER tests. These results are tracked and monitored by the Headteacher and Subject Lead and whole year group anomalies or patterns of concerns shared, discussed and used to inform planning and future CPD.

Monitoring and evaluation

The implementation and impact of our curriculum is monitored by termly book looks and learning walks from Reception to Year 6 by the Subject Leader.

This provides a regular opportunity to ensure consistency, curriculum coverage and progression are observed across the school. In addition, book looks may have an additional focus in line with the current Maths Action Plan e.g. evidence of challenge for Greater Depth children.

These book looks will also provide the Subject Leader an opportunity to discuss with children their learning in Maths and hence measure and monitor their attitudes and understanding of their learning.

This is an open and collaborative process where findings are shared and celebrated to ensure our maths curriculum is always evolving and improving and will continue to ensure we bring out the best in everyone.

Foundation stage

'Sometimes the questions are complicated and the answers are simple'-

Dr Seuss

The Foundation Stage is not considered a satellite to the rest of our Maths curriculum, but rather a fundamental first step on our children's maths journey. As such, our Math's Curriculum's intent and aims are equally applied to the Foundation stage as it is to Key Stage 1 and Key Stage 2.

Mathematics is a specific area of Learning and Development within the Statutory Framework . Mathematics has two aspects:

- Numbers – a strong grounding in number is essential so that all children develop the necessary building blocks to excel in Mathematics.
- Shape, Space and Measure – children are provided opportunities to develop their spatial reasoning skills.

In planning and guiding children's activities, there will be a focus on the three characteristics of effective teaching and learning:

- Playing and exploring - children investigate and experience things, and 'have a go'
- Active learning - children concentrate and keep on trying if they encounter difficulties as well as enjoying their achievements;
- Creating and thinking critically - children have and develop their own ideas, make links between ideas, and develop strategies for doing things.

These activities are achieved by following the White Rose Scheme of Learning for Reception. Drawing from the White Rose activities, children participate in daily adult-led/initiated tasks linked to specific early learning goals. Children are encouraged to record, using marks that they can interpret and explain. From the start of the Spring term, children will record their work in an exercise book used exclusively for tasks to evidence progress towards mathematics early learning goals (ELGs). This record not only enables our children to celebrate their achievements but also evidences progression and prepares our children for expectations in Year 1.

Children's progress is monitored and assessed on an ongoing basis throughout the school year. Accurate recording of achievement against the Early Learning Goals is completed termly. This data is reviewed and discussed with the Headteacher during termly pupil progress meetings to identify those children who are not making the expected progress, enabling the teacher to discuss any interventions that may be needed beyond quality first teaching

Equal Opportunities

Through our Equal Opportunities Policy, our teaching of mathematics provides opportunities for all pupils to develop their skills in mathematics, regardless of gender, colour or race.

Appendix 1

White Rose Mixed Age Yearly overviews (Y1-6)

Appendix 2
Calculation policy

Appendix 3
Vocabulary

Appendix 4

NCETM Nrich links to National Curriculum Objectives matrix

Appendix 5
DfE Mathematical Guidance 2020
Ready to progress criteria