



# Maths Policy

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## Introduction and Aims

This policy outlines how our school fulfils its commitment to teaching and learning in Mathematics and ensures that all children achieve their full potential. It is our intention that the teaching and learning of Mathematics should be challenging, fun, practical, relevant and develop the skills necessary for children to succeed in the 21<sup>st</sup> Century.

## Curriculum and Planning

The National Curriculum dictates the curriculum for Mathematics. As a school, we follow the Focus Education curriculum plans to ensure that all areas are covered and there is consistency across all classes. There may be instances when teachers deviate from this, such as in preparation for end of Key Stage assessments, or to meet the identified and specific needs of individuals/groups of children.

Teachers use the objectives outlined in the Focus Education curriculum to plan Learning Journeys for their class. Teaching input and activities are planned to meet the needs of children in the class and based on continuous formative assessment (see Teaching and Learning).

The 'Curriculum Guidance for the Foundation Stage' is the basis of planning in that phase. It ensures the development of mathematical concepts, which is set out in the Early Learning Goals, underpinning the curriculum planning for children aged 3-5 years. In Year 1, children are likely to be assessed against the Focus objectives (as in the rest of Key Stage 1 and 2) unless they are still working towards achieving their Early Learning Goals, in which case these will form the basis for assessment during the Autumn Term, or continuing as necessary.

As well as being used for the assessment of Maths, the Focus Maths materials are also used to inform teachers in the planning process. They are especially useful for ensuring correct pitch, expectation and differentiation across the different mathematical strands, as well making the next steps in learning clear to both teachers and children.

## Teaching and Learning

There are key expectations for the teaching of Maths in school:

- Maths should be taught 5 times weekly (or the equivalent across a week)
- There should be 5 times each week for children to experience mental and oral maths. The objectives for these sessions should be taken from the Upside Down Inside Out overview. These sessions should be short (5-10 minutes) and collaborative. The emphasis is placed on the key calculation and number skills appropriate for each year group. Reasoning and explanation are very important; the expectation is not on lengthy written calculations. Children may be given specific thinking time to discuss possible answers with a partner or write on a whiteboard. It is expected that children will have the chance to discuss their thinking and hone existing skills. Inside Out Upside Down sessions are a good opportunity to revise previously taught skills, pre-assess existing understanding for upcoming Learning Journeys and for small group intervention to pick up on identified misconceptions from previous sessions.
- All maths lessons are taught through the Maths Learning Journey. All classrooms from Year 1-6 have a working wall on which the current Learning Journey steps are displayed and each child has a picture indicating where they are working. Teachers should design the steps of the Learning Journey based on a balance of the identified needs of children and the Focus Education curriculum plan. For each step (learning objective), there are three levels of challenge: Acquire/Refine, Practise/Apply and Extend/Deepen.
  - Across all levels of challenge, there must be evidenced progress and stretch for every learner.
    - A/R: A chance to learn something totally new, or hone existing skills for which misconceptions exist.
    - P/A: Apply learnt skills to different concepts and in other settings.
    - E/D: Reasoned explanation of open-ended investigations. Children could be challenged to make links between lots of areas of maths.

Example activities for each level of challenge include:

Acquire Refine	Practise Apply	Extend Deepen
<p><b>Sage and Scribe:</b> One child instructs their partner on how to complete the question. Swap roles and repeat.</p>	<p><b>True or False?</b> Chn prove and explain why a given statement/calculation is true or false. For false statements, they correct them to make them true. Opportunity to bring in &lt; and &gt; .</p>	<p><b>Prove if...</b> Chn are given a series of statements. They must use the strategies they have learnt in PA or AR to prove if it is possible or not. E.g. The product of two even decimal numbers is always even. The product of two decimal numbers is always a decimal. A shape always has more sides than corners. Two obtuse angles always create a reflex angle. Chn could sort the statements into always, sometimes and never true.</p>
<p><b>Quiz and Compare:</b> Partner A challenges Partner B to complete a question from their list. They also secretly complete it. When both have finished, they compare answers and coach until they agree.</p>	<p><b>Gap Fill:</b> Chn are given calculations with missing digits. They fill in the gaps.</p>	<p><b>Would you rather...</b> Chn are given a series of options which require them to sue the method or strategy being learnt to solve. E.g. Would you rather have 3 bags of sweets with 16 sweets in each, or 4 bags of sweets which each contain 12 sweets?</p>
<p><b>Showdown:</b> Showdown captain turns over a question and reads it to their team. All chn secretly complete. When everyone has an answer, they flip over their whiteboards to reveal. If everyone agrees, take a team photo and take the next question. Coach until all the team agrees on the final answer. When everyone has got three right in a row, move on.</p>	<p><b>Largest/smallest possible solution:</b> Chn use a given range of digits to make the smallest answer/largest answer possible. Can they do it without repeating digits? What's the difference between the smallest and largest possible solution?</p>	<p><b>If ____ is the answer...</b> Chn are given an answer and they must create four(?) possible question that would give the answer. E.g. ____ = 55. 50 + 10% = 55 100 – 45% = 55 25% of 220 = 55</p>
<p><b>Comparison:</b> Chn compare two calculations/statements and prove which is larger.</p>	<p><b>Links to other areas of maths:</b> A key aspect of practise/apply is to make links to other areas of maths. E.g. when teaching how to multiply decimals, get chn to compare the areas of different things in the classroom. To design an activity that is a meaningful application of the strategy/method, consider the purpose of the calculation and design a real activity that uses it purposefully.</p>	<p><b>Gap fill using &lt; &gt; and =</b> Chn fill in the gaps on calculations e.g. ____ + ____ &gt; _____ - _____</p>
<p><b>Video tutorial:</b> Chn produce a video tutorial to explain how to complete a ____ calculation.</p>	<p><b>Estimate/answer comparison:</b> Chn estimate an answer, calculate it, and then compare with their estimate. Team mate with the smallest difference between the estimate and calculation gets a point. First to five points wins the game.</p>	<p><b>How many ways could you solve it?</b> Chn are given a calculation, with the answer. They create four possible solutions to find the answer. E.g. 45 + 32 = 77 Add the tens, add the units, then add the two answers. Column addition. Number line jumps of tens then units....</p>

(Included to indicate the type of activity for each level of challenge; not intended as an exhaustive list.)

- Before moving to the next level of challenge, or to the next objective, learning should be assessed through appropriate formative assessment. This is likely to be evidenced in children's maths books (e.g. challenge card, Green Pen Work, photograph/QR code linking to video evidence and teacher comment of observed skill, adult snapshot observation etc.).
- Children are not placed in fixed maths groups and the language of maths groups is not to be used. Teaching groups must change every lesson, and within each lesson, based on the emerging needs of the children and identified misconceptions. All children in the class rarely start on a new Learning Journey, or a lesson, at the same point. Instead, pictures on the working wall should be placed to depict where children are working. This should be based on accurate pre-assessment and formative assessment within lessons.
- There is no expectation for all children to complete all tasks. However, everyone must have an opportunity to Extend/Deepen their skills (for lower attaining children, this may be adult supported).

- Children must be given the chance to self-assess and move their picture on the working wall when they feel necessary. Meta-learning can be discretely taught to give children the opportunity to design their own Learning Journey. Equally, adults should corroborate the children's decision through formative assessment.
- There is a standard planning pro-forma available to teaching staff. Planning should indicate Learning Journey steps, success criteria, key questioning, planned input and the activities children are likely to undertake. It is expected that teachers record where on the Learning Journey children are at the start and end of each lesson. This will help inform the next lesson's teaching groups.
- Concrete materials should be used where appropriate to support learning, and taught as a way for children to explain their thinking.
- Calculation methods are taught using the school's Calculation Policy. This ensures that all teachers are consistent in the way calculations are taught throughout the school and linked to the age related expectations for each year group. The calculation policy details a clear and progressive system of developing skills and understanding in the 4 operations of number, starting with concrete models and number lines, before moving on to increasingly compact methods of recording. This policy is shared regularly with parents and displayed in each classroom.
- Rainbow Maths is used in all classes every day. The colours of the rainbow are used to structure increasingly challenging daily practice of key number skills linked to the key objectives for each year group. Children need to achieve 45+ out of 50 in 5 minutes, four times in a row before moving up to the next colour challenge. Each term, all children reset to red. Individual children may be challenged differently (for example, by setting a lower expectation of correct answers in the time) so all children can experience success. Each classroom should have a Rainbow Maths display which shows which level all children are working at. Supporting homework tasks/practice sheets are available to children. Each child's current Rainbow Maths level is their current Maths calculation target. This does not have to correspond to the current Learning Journey in Maths lessons. Rainbow Maths should be tailored to the needs of the children and reflect their learning needs.

### Maths in the Early Years

The Early Years Foundation Stage (EYFS) requires that children must be supported in developing their understanding of Problem Solving, Reasoning and Numeracy in a broad range of contexts in which they can explore, enjoy, learn, practise and talk about their developing understanding. They must be provided with opportunities to practise these skills and to gain confidence and competence in their use. Children learn through their positive experiences of adult interactions and independent critical thinking within an engaging, stimulating and enabling environment. Quality provision in the Early Years encourages children to pose their own problems, with a range of possible solutions. In the Foundation Stage children are taught Maths as part of the Early Years Foundation Stage Curriculum. The Specific Area of Maths learning comprises of two strands:

Number

Shape, Space and Measure

Whole class teaching of Maths is delivered daily and learning is deepened and extended through adult-led focus groups. Each child will have two focus group sessions per week, one with a teacher and one with a Teaching Assistant. In the Summer term, independent Maths activities are introduced so that children complete a Number or Shape, Space and Measure focussed task each day. This supports children with their transition to KS1.

### Inclusion

All children receive quality first Maths teaching on a daily basis and activities are differentiated accordingly. In addition, where identified pupils are considered to require targeted support to enable them to work towards age appropriate objectives, intervention programmes will be implemented. Teachers and teaching assistants plan programmes together and monitor progress of these pupils.

### Assessment and Recording

Totley Primary is committed to assessment for learning. Teachers undertake informal assessment on a daily basis through a range of strategies that should include marking, discussions, direct questioning and observations, which all link to the assessment for learning cycle. These assessments are noted on planning and necessary changes are made in light of the assessments undertaken. Teaching assistants contribute to these daily evaluations, as do children through self and peer evaluation. Marking is carried out in line with the school's marking policy, with "ticks" and "targets" for the children to consider. Any follow up activities which the teacher has prescribed are carried out by the children using green pens. These activities may be designed to reinforce the learning which has taken place in the lesson, pick up on misconceptions or push the learning forward to the next step.

The Focus Education Maths tests are used each term. Teachers may differentiate these so that children feel success by giving children the test below their year group. The results should be used for gap-analysis and can help inform ongoing teaching and learning. However, assessment judgements should not be based solely on these results.

The school uses the Focus Education materials to help teachers to assess individual children's attainment and progress in Mathematics. These may include teacher or teaching assistant notes from observations of a mental and oral session, children's own assessments of their progress, marking of written work, photographic evidence, observations of practical work and strategies used to problem solve etc. This process informs teachers' assessment of children's progress throughout the year, which is recorded on SIMs tracker and reported to the Senior Leadership Team during termly Pupil Progress Meetings.

At the end of the year, children from Year 2 and Year 6 undertake the compulsory SATs. These are reported nationally, and form part of the assessments made by teachers. During the Foundation Stage, assessments are made to provide information for the Foundation Stage Profile.

Formal reporting of progress to parents is given in the form of a written report at the end of the year and discussions in the Autumn and Spring term parents' evenings. Governors are made aware of progress in the termly Head Teacher's report and are given the opportunity to question and challenge the SLT at termly Progress Meetings.

### Monitoring/Reviewing

Teaching and learning in Mathematics is subject to close scrutiny throughout the school year to ensure that the standards detailed in this policy are being maintained and, above all, to ensure that children's academic progress is maximised, regardless of age or attainment. The subject leader, with the support of the Senior Leadership Team, is responsible for evaluating the effectiveness of Mathematics at Totley Primary and this self-evaluation feeds into the annual action plan for Mathematics. This action plan forms part of the School Improvement and Development Plan and the outcomes are reported to the Governing Body on an annual basis in the form of a Subject Leader Report.

The subject leader is responsible for monitoring the standard of teaching and learning in Maths through a cycle of lesson observations (some drop-in), planning and work audits, including standards reviews, as well as pupil interviews. They are responsible for supporting staff to meet the requirements of assessment and reporting. Staff development in Maths takes into account both individual and whole school needs and supports the requirements of the Maths Action Plan/School Improvement Plan. CPD is planned as necessary and as detailed in the annual Mathematics Action Plan

Key strand	Success criteria	Monitoring	Further actions
Upside Down Inside Out Maths	<ul style="list-style-type: none"> <li>Objectives taken from Focus Education curriculum plan</li> <li>5x weekly</li> <li>Quick, fun and collaborative</li> <li>Pre-assessment, pre-learning, revision and intervention of misconceptions.</li> <li>Informed by the needs of the children</li> </ul>	<ul style="list-style-type: none"> <li>Termly drop-in by subject leader/SLT</li> </ul>	<ul style="list-style-type: none"> <li>Share best practice each term at CPD</li> <li>Termly focus (e.g. certain teaching and learning structures)</li> </ul>
Maths Learning Journey	<ul style="list-style-type: none"> <li>Working wall in each classroom for Year 1-6</li> <li>No fixed maths groups- change between and within lesson. Record where each child begins and ends each lesson</li> <li>Flexible teaching that adapts to the identified needs of individual children</li> <li>Every child has their photograph indicating at which step they are working</li> <li>Three levels of challenge for each step (objective) as A/R, P/A and E/D</li> <li>Check learning before moving to the next step through quality, pre-planning AfL and incidental assessment opportunities</li> <li>Children have a key role in shaping their own learning journey</li> <li>Meta-learning taught so children make informed choices for their learning</li> </ul>	<ul style="list-style-type: none"> <li>Termly lesson observation or learning walk</li> <li>Planning scrutiny</li> <li>Book look</li> </ul>	<ul style="list-style-type: none"> <li>CPD as appropriate (but at least termly)</li> <li>Shared planning sessions as appropriate</li> <li>Opportunity to share best practice</li> </ul>
Rainbow Maths	<ul style="list-style-type: none"> <li>Displayed in each classroom</li> <li>Progressively more challenging as children move up the rainbow</li> <li>Differentiate the challenge according to individual needs so all children feel success</li> <li>Objectives linked to age related expectations/the year group curriculum that individual children are working on</li> </ul>	<ul style="list-style-type: none"> <li>Teachers report when children moved up each step and where they ended each term</li> </ul>	<ul style="list-style-type: none"> <li>CPD to launch Rainbow Maths</li> <li>Letter to parents</li> <li>Information on the website</li> <li>Practice/homework sheets distributed as necessary</li> </ul>
Calculation policy	<ul style="list-style-type: none"> <li>The key strategies for the four operations are displayed in each classroom in a consistent style (example calculation and matching success criteria)</li> <li>The key strategies for the four operations are shared with parents at the start of each new year</li> <li>The calculation policy is tied closely to age-related expectations and can be used to help inform teaching and assessment</li> <li>Teachers may support and challenge individual children by using alternative methods as appropriate</li> </ul>	<ul style="list-style-type: none"> <li>Book look and planning scrutiny should tie into the methods and strategies for the year group</li> </ul>	<ul style="list-style-type: none"> <li>Share reviewed calculation policy with staff</li> <li>Complete example calculations for each classroom by end of Summer Term</li> <li>Share example strategies document in September</li> <li>Review calculation policy with SWIP Maths colleagues and amend as appropriate</li> </ul>