

TMPF MATHEMATICS POLICY 2019

"Mathematics is the alphabet with which God has created the universe." Galileo

This document is a statement of the aims, principles and strategies for the teaching and learning of mathematics within our school.

Ratified:

Review date:

“The most important reason for teaching mathematics to all children is that it can be used to provide them with a powerful means of communication to represent, to explain and to predict.” (The Cockroft Report)

Mathematics equips pupils with the uniquely powerful set of tools to understand and change the world. These tools include logical reasoning, problem-solving skills and the ability to think in abstract ways.

Mathematics is important in everyday life. It is integral to all aspects of life and with this in mind we endeavor to ensure that children develop a positive and enthusiastic attitude towards mathematics both in and beyond the classroom.

RATIONALE

All school policies form a corporate, public and accountable statement of intent. This policy has been created based upon a whole school approach understood and agreed by staff, children, parents and Trustees. This policy is the formal statement of intent for mathematics. It reflects the essential part that mathematics plays in the education of our pupils. It is important that a positive attitude towards mathematics is encouraged amongst all our pupils in order to foster self-confidence and a sense of achievement. The policy also shows how we, as a Trust, meet the legal requirements of recent Education Acts, the Renewed Framework and National Curriculum requirements.

This policy relates to all pupils, staff (including volunteers), parents/carers and Trustees of The Moorlands Primary Federation (TMPF).

AIMS AND OBJECTIVES

Although relating specifically to mathematics, the aims identified in this policy are also in line with the Trust's general aims.

At TMPF we aim to equip all our children with the basic numeracy skills necessary for life. Mathematics is enjoyable and children are encouraged to work practically as they study mathematics all around them. We view the quick recall of basic facts as very important in mathematics and therefore provide children with regular opportunities for practice and consolidation of fundamental skills in a fun and practical way. Pencil and paper procedures are founded upon these skills in a natural progression. Children are encouraged, and given the opportunity to develop the skills of, thinking clearly and logically, developing problem solving skills and having the confidence to overcome difficulties using a variety of appropriate methods.

The schools in our Trust aim to develop in children a positive attitude towards mathematics by making it an interesting, enjoyable, challenging and relevant subject as well as providing opportunities for all children within the school to develop to their full potential in mathematics.

Furthermore, we deliver our planned learning experiences in a mathematically enriched environment thereby providing the pupils with a stimulating and supportive framework from which to build upon. It is the aim of the school to promote highly the subject of mathematics - see TMPF Learning Environment Policy.

We aim to develop in children the correct use and understanding of appropriate mathematical vocabulary.

PLANNING AND ORGANISATION

TMPF adheres to the guidelines laid down in the National Curriculum for Mathematic. Our curriculum planning is based upon the Collins Busy Ants guidelines, which is modified by class teachers to be appropriate to each class.

Planning in mathematics is a process in which all teachers are involved, wherein:

- Work plans are drawn up by class teachers, both half-termly and weekly and are monitored by the Maths Co-ordinator, who works under the direction of the Trust Maths Leader;
- When appropriate, staff meetings/INSET time is used to discuss the mathematics curriculum to ensure consistency of approach and standards, to train staff and to discuss any new developments.
- The whole staff considers implications from School Action Plans through a process of collaboration and through liaison with the Trustees and external agencies as appropriate.

To ensure continuity in the teaching of written computations (TMPF Calculation Policy) all Trust schools have agreed upon an approach to be used with the *majority* of pupils (see TMPF Calculation Policy). It has been recognised that this may need to be adapted for individual pupils experiencing specific learning difficulties. This matches the teaching taking place within the Busy Ants scheme of learning and outlines mental and written strategies.

In every Maths lesson a learning objective should be shared. This may be differentiated to suit the children's' needs or there may be one for the whole class. During each Maths lesson, differentiation should be seen to ensure all children's needs are being met. The Busy Ant's workbooks offer differentiation and the online planning documents have further 'support' and 'extension' sheets, meaning that, in some lessons, there are 5 layers of differentiation. It is not mandatory for teaching staff to use success criteria with the children in mathematics, however, staff may use these at their discretion should they wish to do so.

The expectation of written work is as follows.

- Nursery and Reception are able to use worksheets when necessary due to the nature of their learning environment.
- Year 1 and Year 2 may predominantly use worksheets in the autumn term, but there is an expectation that in the spring term, a balance of written work and worksheets should be evident in their Maths books.
- In Year 3, worksheets may be used in the first half of the autumn term, while children adjust to a new Key Stage, but after October half term, a move towards more formal, written work should be seen.
- From Year 4 to Year 6, children may use worksheets occasionally, depending on the strand of maths being taught, but the work evident in books should be predominantly written work.

In order to adhere to the TMPF Learning Environments Policy, a Maths Working Wall should be available in each class. The appearance of these may vary across the five schools, however, the work on them should reflect the current teaching and should be no more than a week behind what is being taught. These should reflect the whole maths curriculum and shouldn't be focussed specifically on number.

EQUAL OPPORTUNITIES

All pupils, irrespective of age, ability, gender and ethnic origin or disability are entitled to participate fully in and benefit from a broad range of appropriate mathematical experiences at every stage of their time at our school.

This is in accordance with TMPF Equal Opportunities Policy.

SPECIAL NEEDS

Individual needs are catered for by differentiated work in the numeracy lessons and where appropriate, by targeting specific needs through Intervention Plans. This covers both children with learning difficulties and those recognised as being gifted and talented.

ASSESSMENT (see appendix 1)

Assessment is regarded as an integral part of teaching and learning and is a continual process. Staff at TMPF use the results of both on-going teacher assessment and formative assessment to help them make informed decisions about the progress of individuals and groups, to map out the next developmental stage and to evaluate their delivery of certain aspects of the mathematics curriculum. It is the responsibility of the class teacher to assess all pupils in their class and to make it purposeful, so giving the greatest opportunity for children's development and progress.

Information for assessment will be gathered in various ways:

- Using the TMPF Maths Assessment System;
- Formative assessment (assessment for learning) carried out informally by teachers in the course of their teaching;
- Talking to and working with the children giving immediate feedback during lesson time;
- Observing and marking pupil's work;
- Assessing topics at the end of a unit;
- Annual statutory SATs for Y2 and Y6;
- Foundation Stage Profile and 2Simple;
- New EYFS Baseline;
- End of term assessments using the Headstart or Collins materials;
- End of unit assessments using the Headstart or Collins materials;
- Using the TMPF End of Year expectations document;
- The children's self-assessment of their mathematics work

Children and teaching staff have access to Timestables Rockstars online, which should be monitored and reviewed regularly to ensure that children are making progress in this area. Children and parents also have access to this at home as a resource for their learning.

Children will be encouraged to discuss their progress before and after each 'strand' of learning has been taught using the 'My record sheets'. From this, the children set personal targets throughout the key stages.

The effective marking of pupil's work aims to give feedback which informs next stages of learning, celebrates success, is encouraging, supportive and clear and where individual targets are reviewed and set as appropriate. If it appears that a child has grasped a topic, a challenge should be set which tests that the children can apply this learning in different contexts – see TMPF Principles of Feedback. To reduce teacher workload and provide immediate feedback for pupils, marking, where appropriate, should be done during lesson time by the children. Children should also be given appropriate time ('fix it time') to amend and correct their work with teacher guidance if necessary. The timings of this will vary from school to school.

Continuous assessment takes place by drawing out of learning outcome appropriate to all, most or some children. Learning outcomes are shown on the medium-term planning sheets.

For the academic year 2019/20, reporting to parents is done termly with a written report. Parents meeting with class teachers are offered biannually or more frequently upon need or required.

RESOURCES

The school has a range of resources and each class teacher is responsible for ensuring their lesson is fully resourced and that any shortages are reported to the Maths co-ordinator and/or Trust Maths Leader.

Each teacher has access to the Busy Ants online platform where they can find individual lesson plans, the assessment resources outlined in appendix 1 and presentations to aid the lesson. For Foundation Stage there is a workbook that can be used for written evidence of children's work. For Key Stage 1, there are three workbooks (A,B and C) that match the online planning resource. For Key Stage 2, each teacher has access to online planning and fifteen workbooks for each A, B and C. Each of these workbooks builds on the knowledge in previous workbooks. In the front of the workbook is an overview of the learning that should take place in that term and each of the workbooks is broken down into challenges 1, 2 and 3 to aid differentiation.

On the shared area, staff can find the Headstart End of Term assessments along with mark schemes and scaled scores.

Each teacher also has access to Timestables Rockstars and should regularly review and set targets to improve the children's understanding of times tables. Children and parents also have access to this at home.

Resources are stored both in individual classrooms, online and on the shared TMPF platform.

ROLE OF Maths CO-ORDINATOR

The role of the mathematics co-ordinator is to:

- Contribute to policy development and to ensure progression and continuity in mathematics throughout the school.
- Monitor progress in mathematics and feedback to the Trust Maths Leader on action needed on a regular basis through book trawls, planning trawls and learning walks. Targets set from these should be fed back to staff and recorded on PDP's.
- Support colleagues in their planning, delivering and assessing of mathematics.
- Work within specific year groups, focusing on specific, identified targets, as is felt appropriate and as is identified by regular monitoring.
- Deliver INSET as appropriate, based upon needs discovered by regular monitoring.
- Teaching sample lessons as is felt appropriate.
- Ensure the development of the learning and teaching of mathematics is celebrated and developed as part of their role within TMPF Maths Team.
- Be responsible for analysing mathematics data (end of term and end of year assessments) and feeding back to the Trust Maths Leader.
- Take responsibility for updating their Maths Action Plan for the school and feeding this back to the Trust Maths Leader.
- Feedback to the Trust Maths Leader every half term with an overview of the actions taken place, the, an overview of strengths and an overview of development points.

Role of the Trust Maths Leader

- Take the lead in policy development and to ensure progression and continuity in mathematics throughout the MAT.
- Monitor progress in mathematics and advise the Trust Leadership Team on action needed on a regular basis forming an action plan as a MAT.
- Take responsibility for the purchase and organisation of central resources for mathematics.
- Keep up to date with developments in mathematics education and disseminate information to colleagues as appropriate, by regularly attending courses and being aware of new publications and guidelines.
- Supporting Maths Co-ordinators in other schools by attending learning walks, completing book trawls and planning trawls.
- Share proformas for planning and book trawls and learning walks.
- Report to the Federation Leadership Team and Trust Board.

MONITORING

The Mathematics Co-ordinator and the Trust Maths Leader take responsibility for the monitoring of the mathematics curriculum on offer and the standards achieved and progress made by the pupils.

Monitoring takes the form of:

- Lesson observation and feedback
- The co-ordinator working with specific year groups and staff as is deemed appropriate.
- Half-termly planning trawls
- Half-termly book trawls
- Pupil and staff conferencing and questionnaires.

See TMPF Learning Walk and Lesson Observation Policy.

HEALTH AND SAFETY

All mathematics lessons adhere to TMPF Health and Safety Policy.

INFORMATION TECHNOLOGY (IT)

I.T. is a major resource in the teaching of mathematics. IT should be used regularly through resources on interactive whiteboard. In each room. IT supports teaching and motivates children's learning. Children have access to 'Timestables Rockstars' online at home to support their understanding in this area. This can be used on laptops to aid access when completing the multiplication tables test that will be introduced in 2020. They are also able to access this on tablets and android phones.

The use of the internet is encouraged to promote the quality of the teaching and learning of mathematics.

The use of IT in the learning and teaching of mathematics adheres to both the school's online and Health and Safety Policies.

Assessment (appendix 1)

Assessment Exercises

Domain	National Curriculum attainment target	Assessment Task(s) and/or Exercise(s)
Number – Number and place value	Count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number	1
	Recognise the place value of each digit in a three-digit number (hundreds, tens, ones)	2
	Compare and order numbers up to 1000	3
	Identify, represent and estimate numbers using different representations	4
	Read and write numbers up to 1000 in numerals and in words	5
	Solve number problems and practical problems involving these ideas [i.e. Number and place value]	6
Number – Addition and subtraction	Add and subtract numbers mentally, including: <ul style="list-style-type: none"> – a three-digit number and ones – a three-digit number and tens – a three-digit number and hundreds 	7
	Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction	8 and 9
	Estimate the answer to a calculation and use inverse operations to check answers	
	Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	Tasks: 10 and 13 Exercise: 10
Number – Multiplication and division	Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables	11
	Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods	12
	Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects	Tasks: 10 and 13 Exercise: 13

Domain	National Curriculum attainment target	Assessment Task(s) and/or Exercise(s)
Number – Fractions	Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10	14
	Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators	15
	Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators	16
	Recognise and show, using diagrams, equivalent fractions with small denominators	17
	Add and subtract fractions with the same denominator within one whole [for example, $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$]	18
	Compare and order unit fractions, and fractions with the same denominators	19
	Solve problems that involve all of the above [i.e. Fractions]	20
Measurement	Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)	21
	Measure the perimeter of simple 2-D shapes	22
	Add and subtract amounts of money to give change, using both £ and p in practical contexts	23
	Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks	24
	Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight	25
	Know the number of seconds in a minute and the number of days in each month, year and leap year	26
	Compare durations of events [for example to calculate the time taken by particular events or tasks]	27
Geometry – Properties of shapes	Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them	28
	Recognise angles as a property of shape or a description of a turn	29
	Identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle	30
	Identify horizontal and vertical lines and pairs of perpendicular and parallel lines	31
Statistics	Interpret and present data using bar charts, pictograms and tables	32
	Solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables	33

Key Principles of Busy Ant Maths Assessment

Busy Ant Maths identifies two main purposes of assessment:

- assessment *for* learning (on-going formative assessment)
- assessment *of* learning (summative assessment).

Assessment *for* learning involves both pupils and teachers finding out about the specific strengths and weaknesses of individual pupils, and the class as a whole, and using this to inform future teaching and learning.

Assessment *for* learning:

- is part of the planning process
- is informed by learning objectives
- engages pupils in the assessment process
- recognises the achievements of *all* pupils
- takes account of how pupils learn
- motivates learners.

Assessment *of* learning is any assessment that summarises at what level individual pupils, and the class as a whole, are working at a given point in time. It provides a snapshot of what has been learned.

Busy Ant Maths offers manageable and meaningful assessment on four levels:

- **Diagnostic assessment**

The Assessment Tasks are designed to assist teachers in determining pupils' readiness for a particular Busy Ant Maths unit of work. They are designed to yield information that will directly support individual pupils and whole-class teaching.

- **Short-term 'on-going' assessment**

Progress Check Questions are an important feature of every Busy Ant Maths lesson and are linked to specific learning objectives. They are designed to provide immediate feedback to pupils and to gauge pupil progress in order to adapt teaching.

Shared Success criteria are also provided in each lesson to assist pupils in identifying the steps required to achieve mastery of the learning objective.

- **Medium-term 'formative' assessment**

As well as being used for diagnostic assessment, the Assessment Tasks, along with the Assessment Exercises, can be used to review and record the progress of both individual pupils and the class as a whole, in relation to the National Curriculum attainment targets.

An End-of-unit Test is provided for each of the 12 Busy Ant Maths units. Each test is designed to assess the mathematics covered during the three week unit.

The formative Assessment Tasks, Exercises and Tests provide individual and/or group opportunities to identify those pupils who have not yet achieved (NYA), or who have achieved and exceeded (A&E) national expectations. They can also be used to set individual targets for pupils.

Using the Headstart materials, children should be assessed termly completing the question by question analysis and identifying gaps in the children's understanding. Children should also be given a scaled score in line with the Headstart assessment process.

- **Long-term 'summative' assessment**

The various record-keeping formats found in this Assessment Guide are designed to show individual pupils' level of understanding against national standards. They draw on the data gathered throughout the year, including results from Assessment Tasks, Exercises and Tests,

performance in whole class discussions, participation in group work, written evidence and any other supplementary notes. Importantly, they also help to identify whether pupils are on track to meet end of key stage expectations. This data should also be transferred onto the TMPF assessment system to track the pupils progress throughout the year.

Assessment Exercises

Purposes

- To assess individual pupils' level of mastery in a specific National Curriculum attainment target (NC AT).
- To identify individual pupils' strengths and weaknesses in a specific NC AT.
- To identify those pupils who are achieving *above* or *below* expectations.
- To inform future planning and teaching of individual pupils and the class as a whole.

When to use the Assessment Exercises

- Assessment Exercises should be given at the start of a new strand of learning (the beginning of each week, or the end of the previous week) to ascertain children's understanding in this area of learning. This will also provide teaching staff with the information they need with regards to differentiation. These do not necessarily need to be a written assessment, it may be delivered verbally by the class teacher with a record of children's responses in their Math's books or one question from each of the sections may be given in order to test pupil's application and understanding of different skills.
- Any time throughout the year when teachers are uncertain about a pupil's, or group of pupils', level of understanding in a specific NC AT.
- When requiring written evidence of a pupil's level of understanding in a specific NC AT.
- Assessment Exercises differ from the End-of-unit Tests (see pages 14 and 15) in that an Assessment Exercise is designed to assess understanding of a specific NC AT, i.e. the *end-of-year level of expectation*, whereas an End-of-unit Test assesses all of the NC ATs taught in a particular Busy Ant Maths unit. It is designed to assess the exact mathematical content that has been taught during the unit and therefore will not always assess *the end-of-year level of expectation*.

How to use the Assessment Exercises

- This section provides a photocopiable pupil Assessment Exercise and accompanying teacher's notes with answers and marking commentary for each of the NC ATs.
- The way in which the Assessment Exercises are administered is entirely up to the discretion of the individual teacher.
- It is advised that before pupils begin an exercise, you read through and explain the exercise to the pupils to ensure that they understand each of the questions. Also ensure that pupils have any necessary resources.
- After marking the Assessment Exercise, you then decide, based on the results of the exercise, the level of understanding achieved by the pupil for that specific NC AT, i.e. 'Not yet achieved' (NYA), 'Achieved' (A) or 'Achieved and exceeded' (A&E).
- The data collected can then be used to update either the paper or electronic versions of the *Whole-class National Curriculum Attainment Targets* record. (See below for details)

End-of-unit Tests

Purposes

- To assess understanding of the concepts taught in a Busy Ant Maths unit.
- To assist teachers in assessing individual pupils' level of understanding in a particular National Curriculum Programme of Study Domain.
- To inform future planning and teaching of individual pupils and the class as a whole.
- To identify those pupils who are achieving *above* or *below* expectations.

When to use the End-of-unit Tests

- At the end of a three week Busy Ants Math's unit. End of unit tests are made up of questions that test the learning taken place during that unit. Instead of taking the test all in one go, teaching staff may wish to break these down and deliver them at the end of each week.
- End-of-unit Tests differ from the Assessment Exercises in that an End-of-unit Test assesses all of the National Curriculum attainment targets (NC ATs) taught in a particular Busy Ant Maths unit. They are designed to assess the exact mathematical content that has been taught during the unit and therefore will not always assess *the end-of-year level of expectation*. An Assessment Exercise, however, is designed to assess understanding in a specific NC AT, i.e. the *end-of-year level of expectation*.

How to use the End-of-unit Tests

- This section provides a three-page photocopiable test, and accompanying teacher's notes with answers and marking commentary, for each of the 12 Busy Ant Maths units. End-of-unit Tests consist of one page of questions per week taught within that unit, assessing the NC ATs taught during that week.
- The way that the End-of-unit Tests are administered is entirely up to the discretion of the individual teacher as mentioned previously.
- It is advised that before pupils begin a test, you read through and explain the test to the pupils to ensure that they understand each of the questions. Also ensure that pupils have any necessary resources.
- After marking each page of an End-of-unit Test, you then decide, based on the results of the page, the level of understanding achieved by the child for that particular Domain.
- The data collected can then be used to update either the paper or electronic version of the *Whole-class National Curriculum Attainment Targets* record (see above for details).

Pupil Self-assessments

Purpose

- To provide pupils with the opportunity to undertake some form of self-assessment at the start and at the end of a Busy Ant Maths unit.

When and how to use the Pupil Self-assessments

Distribute the relevant Pupil Self-assessment at the start of each week or at the beginning of the academic year. Pupils make a judgement about their current level of understanding for each of the 'I can' statements for the week. At the end of each week pupils revisit the booklet to re-assess their level of understanding.

- The empty box at the bottom of each page is designed to be used by pupils to record anything special that you might like them to have a record of, for example:
 - a relevant piece of work, drawing, calculation, statement or other piece of written evidence
 - anything the pupil feels they need more practice on
 - what the pupil thinks they should or could learn next
 - any special equipment that the pupil used to help them during the unit
 - anything the pupil particularly liked or disliked that they did during the unit.
- After pupils have completed a page (or the entire booklet) as a class, discuss specific statements, asking individual pupils to comment on what they have written.

The image shows four pages from a Year 3 self-assessment booklet. The pages are:

- Page 1: Unit 8 - Measurement (perimeter)**. It contains four 'I can' statements with smiley face ratings for 'Start of the week' and 'End of the week'. A large empty box at the bottom is for a record sheet.
- Page 2: My record sheet**. It features two cartoon ants, the title 'My record sheet', 'Year 3 Unit 8', and fields for 'Name: _____' and 'Date: _____'.
- Page 3: Unit 1 - Number and place value - Multiplication and division**. It contains seven 'I can' statements with smiley face ratings for 'Start of the week' and 'End of the week'. A large empty box at the bottom is for a record sheet.
- Page 4: Unit 2 - Fractions**. It contains three 'I can' statements with smiley face ratings for 'Start of the week' and 'End of the week'. A large empty box at the bottom is for a record sheet.

Headstart End of Term and End of Year assessments

Purpose

- To assess understanding of the concepts taught throughout the term.
- To assist teachers in assessing individual pupils' level of understanding of topics covered throughout the term.
- To inform future planning and teaching of individual pupils and the class as a whole.
- To identify those pupils who are achieving *above* or *below* expectations.
- To inform the TMPF Assessment system and determine areas for development.

When and How to use the End of Term assessments

- At the end of a term.
- End of term assessments differ from the Assessment Exercises and End-of-unit Test as they assess all of the National Curriculum attainment targets (NC ATs) taught throughout the term. They are designed to assess the mathematical content that has been taught during the unit and give an indication to the level that the children are working at through the scaled score that the children will receive.
- These can be found on the shared area along with scaled scores and mark schemes.
- The way that the End of Term assessments are administered is entirely up to the discretion of the individual teacher.
- After marking each page of an End of Term tests, the data should be transferred onto the question by question spreadsheet found on the shared area. This identifies gaps in the children's knowledge and will inform planning and the TMPF assessment system. End of Term assessment results should be sent to the Maths Co-ordinator in your school.
- At the End of the year, Collins have produced a SATs style test paper, which can be found on The Busy Ants page. For Key Stage 1, there is 1 arithmetic and 1 reasoning paper and for Key Stage 2, there is 1 arithmetic and 2 reasoning papers. These should be completed within a reasonable amount of the timescale suggested in preparation for end of key stage assessment. Once this has been marked, children should be given a percentage that aligns with the level in which the children are working at. All of these resources can be found in the Busy Ants area. The Headstart assessment should be completed alongside this to ensure continuity throughout the year.

