



Mathematics Policy

Date: November 2017

Review Date: September 2018

Tinsley Meadows Primary School

MATHEMATICS POLICY

Purpose

Mathematics is a creative and highly inter-connected 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. The Maths curriculum should be bold, provide breadth and balance and be relevant to suit the needs of all children in the modern world. It should be flexible giving time to ensure all concepts are mastered, motivating to all pupils, encouraging success at all levels.

Aims

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.

AIMS

This policy is set within the context of the school's vision, aims and policy on teaching and learning. It is based around the idea of helping children to master each maths concept and deepening their knowledge and aims to ensure that all staff, children, parents/carers and trustees are aware of how the learning and teaching of Maths will take place at Tinsley Meadows.

- To provide interesting and well planned work to promote children's enjoyment of Mathematics
- To develop children's mathematical thinking and conceptual understanding

- To deepen the understanding of all children
- To help children acquire and apply the mathematical skills necessary for solving problems
- To develop children's confidence in Mathematics
- To prepare our children for applying their skills effectively in everyday life situations, in their future learning and in the work place.
- To give all the children building blocks in place to provide a solid foundation to lead onto secondary, further and higher education.

We work to develop children's ability to:

- Use mathematics for practical tasks.
- Use number to solve problems, estimate, interpret and check results.
- Select the most efficient methods of solving calculations
- Recognise and explore patterns in number and use symbolic representation.
- Recognise and use properties of 2D and 3D shapes.
- Collect and interpret data.
- Choose, use and take responsibility for all mathematical equipment to support their own learning.

TINSLEY MEADOWS - NON_NEGOTIABLES

The following points reflect what we as a staff feel is essential to deliver quality first Mathematics teaching:

- Everyday is a mental Maths day
- Hands on learning is essential
- Use models and images to support learning
- Talk Maths! (model the correct use of mathematical vocabulary)
- Make Maths Fun and interesting
- Help children learn from their mistakes
- Use Inspire Maths and Numicon along with other practical and interactive resources to involve children in their learning in a fun way.
- AFL used throughout all learning to support in planning and the next steps for the children.

Principles

Planning

- Planning begins from a thorough understanding of children's needs gleaned through effective and rigorous assessment and tracking, combined with high expectations and ambition for all children to achieve. We track the children's progress and we use this to plan at the correct level for the class. This is done through the use of the PUMA termly test, half-termly tests and teacher assessment from day-to-day lessons.

- Within short term planning, clear success criteria and learning objectives taught should be created – demonstrating the progression needed to reach and exceed the objective. Objectives and supporting resources for this can be found in the Inspire scheme based on the Singapore principles for Maths and the White Rose Hubs Maths scheme that has aligned mastery principles with the National Curriculum 2014. This will enable the class teacher to follow a clear and systematic teaching sequence, where input and activities are differentiated by considering which parts of the success criteria individual children are ready for and the concrete resources that have been selected by the children. It should also include deepening activities to show how the early graspers are being challenged through real life application without moving on to a new concept.
- Planning, where possible, should involve real life contexts for maths, where children are problem solving with a purpose in mind.
- Throughout the lesson, children will be using talk frames and Kagan structures to ensure they are engaged in the language of maths correctly and they are cooperating effectively with the children on their table. They should be encouraged to verbalise all number sentences to help them understand the relationships within the calculation.
- Class teachers should regularly plan for opportunities for children to apply their maths skills to different problems within maths lessons and across the curriculum. This will also allow children to revisit, practice and consolidate different areas of maths and apply them within different contexts.
- When planning across the curriculum, questions should be used within titles of units of work and lessons, to initiate an ‘enquiry’ approach. There should be opportunities for investigation built into units allowing children to develop their resilience and understanding that there may be multiple solutions to a calculation or problem. Skills of problem solving can then be taught with consistency and we use RUCSAC to support the children in a systematic approach to problem solving.

All staff are expected to use an agreed planning template. Planning must show

Short term:

- Plans must show the learning objectives for the session. The Inspire Teacher Guides and White Rose Math Hubs Small Steps are used to form these to ensure curriculum coverage.
- The key vocabulary that EAL learners need to be taught if they are to fully access the content of Maths lessons.
- Deepening activities to extend the early graspers
- Any concrete resources which are required in the lesson.

Short term planning is to be accompanied by a detailed flipchart that clearly shows the structure and progression in the lesson. There needs to be evidence on this flip chart to show where it links with the Inspire textbooks (through scanned images or the pages that the slide links to) and opportunities for the children to be using resources and discussion work. There should be opportunities for children to practise their fluency through varied activities before moving on to applying each concept through problem solving and reasoning questions.

In line with our mastery approach, all lessons should follow the 6 part lesson structure below. Concrete resources must be available for all children to access on tables.

1. **Review and do (5 mins)** – this could be of your previous lesson or a review of prior learning on the concept taught. Key vocabulary also needs to be reviewed/introduced for the concept.
2. **Introduce the ‘HOOK’** (10 mins (6 min for child-led and 4 min feedback)) – a question that children can all access and discuss with their Kagan partners to get them thinking about the concept and learning that will take place in the lesson.
3. **Initial practice-** teaching through the children’s work (5 mins) – work an example with the children – could you use miming or another technique here? (Research)
4. **Refining of the technique-** Modelling/Variation/Making connections (20 mins) – this should be a mix of teacher taught and child-led with a ping-pong style of activities. Here children will use their concrete resources and pictorial representations to develop their fluency and understanding while drawing and making connections with prior learning. This does not always need to be on boards. It could be a worked example in books that the children mark and correct during the session.
5. **Practice of examples** – independent use of variation and using connections (text book examples) (20 mins) – children complete independent tasks. This could be practical with pictures for evidence of learning or written books. Monitor learning closely and move children on to deepening tasks where appropriate. Deepening tasks are not for when a child has completed a set amount of questions but for when it is clear they have understood the learning for that lesson.
6. **Review** – briefly summarise the session content and get the children to verbally explain to each other or write down a general rule for what they have

learnt. This does not always need recording but would be encouraged at the end of a concept. (5 mins)

These timings are approximate and will vary based on the understanding of your children and the concept being covered.

TEACHING

- In the Foundation Stage, children are given the opportunity to develop their understanding of number, measurement, pattern and shape and space through a combination of short, formal teaching as well as a range of planned structured play situations, where there is plenty of scope for exploration.
- Children will become very competent 'counters' so that their fluency with the number system provides a foundation for mathematical understanding. Counting forwards and backwards in many different sized steps as well as from different starting and ending points is essential.
- Maths learning builds from a concrete understanding of concepts where children are manipulating objects. When children are able to see concepts this way, they then need to understand the same concepts represented pictorially. Children are then ready for abstract representation before being able to apply their knowledge to different situations.
- Children should be encouraged at all times to communicate their understanding of maths so that it clarifies their thoughts. As a school we use Kagan structures to engage the children in talk and these should be used throughout the Maths lesson. Children should be encouraged to fully explain how they have arrived at their answer rather than just accepting that they have arrived at the right or wrong answer.
- Children's mental maths is of great importance, with number bonds, times tables facts and various strategies for calculation taught and practiced at school with support sought from parents through homework activities. These are also revised and practised through Basic Skills sessions twice a week.
- A progression towards efficient written calculations should be developed and applied consistently in each year-group. The school Calculation Policy should be followed.
- Class targets should be used to ensure areas where the majority of the class have not grasped a concept can be revisited and mastered.
- Though the nature of lessons will be very different depending on the needs of the class, children should be: active; practicing skills they haven't yet mastered (perhaps recapping on class targets); learning something new OR learning to apply their knowledge to different contexts. They should be: 'doing' very quickly; working at a good pace and being productive; sharing their thoughts and methods and being successful.

- When teaching problem solving skills across the curriculum, time (and sometimes whole lessons) should be given to each aspect of problem solving ensuring children get thorough practice at: 'preparing for problem solving', 'thinking through problems to establish what they know and don't know so far'; actually 'doing the problem solving' effectively AND 'communicating the answer effectively'. They should evaluate the process too. Over time children will improve at each aspect.

VOCABULARY

The development of children's mathematics vocabulary is crucial. At Tinsley Meadows, teachers have mathematics vocabulary, learning objectives and visual aids on display which are referred to throughout the lesson. This emphasises the key words. In the Mental and Oral session children are encouraged to use key words, and during the lesson they are expected to describe and explain their work using appropriate mathematical language. Wherever possible, they are encouraged to use complete sentences to answer questions, these may be displayed on the boards as talk frames where the children fill in the appropriate information.

HOMEWORK

Homework is set weekly for every group in school. Homework may involve learning number facts by heart as well as using Maths in more creative ways though topic-based tasks. Each year group provides a weekly homework club where additional support is available to the children who require it. The school actively encourages parents to support children with their homework and holds parent workshops where the principles and strategies being used in lessons are discussed in detail.

PARENTAL INVOLVEMENT

At Tinsley Meadows, we believe parental involvement is crucial in helping children to fulfil their potential. As a result, a number of whole school initiatives have been put in place:

- Maths workshops for parents: children and parents attend the sessions together. The aim is to develop the confidence of all who attend while at the same time clarifying more difficult areas of Maths.
- Maths Fun Days: parents can join their children as they take part in a range of mathematical activities. The aim of Fun days is to raise the profile of Maths in school and to develop children's enjoyment of the subject

ASSESSMENT

- Assessment for learning should occur throughout the entire maths lesson, enabling teachers/teaching assistants to adapt their teaching/input to meet the children's needs. This feedback should be incisive and regular.

- On a daily basis children should self-assess against the learning objective and success criteria, giving them a sense of success. Children should know when they are meeting their targets and be self-assessing against those too.

Short term:

- Pupil's work should be marked daily in line with the Marking Policy and should model how corrections should be made, giving children a chance to learn from their misconceptions or incorrect methods.
- Future lesson design should depend on class success evaluated through marking and observations made during the lesson.

Longer term:

- Children are tested on their times tables once a week and regularly on other areas of Maths to support ongoing assessment
- Assertive Mentoring – children are set individual targets which are reviewed three times a year between the teacher, child and the child's parents to ensure all the children are making progress and are aware of what they need to work on in the future. These targets personalises the learning for the children at the level they need.
- Sheffield Tracking grids are completed over the year to help support the teachers' assessment of the children against the Steps. Teachers use this information to inform planning for groups and individual pupils.
- Y6 pupils are assessed using the statutory SATs material.
- Summative assessments are entered onto Sheffield STAT tracker on a termly basis in order to provide further understanding of the level a child is working at and to inform a more rounded judgement of their abilities.
- Pupil Progress Meetings are help with SLT to ensure all children are being supported at the level they need, progress is being made and interventions are used where necessary to stop children falling behind. What that support will be and how intensive, depends upon the child's needs and it may be a simple strategy within whole class teaching that is needed. Where further support is deemed necessary, children can access interventions, explained below.

REPORTING

Parents are invited to discuss their child's progress with the class teacher on a termly basis. Extra meetings between parents and teachers can also be arranged at mutually convenient times. Reports are also written yearly and parents are invited in to discuss the report with the class teacher.

MONITORING AND EVALUATION

- Teachers' Maths planning is available to the Maths Co-ordinator and Head teacher for monitoring purposes on the Network

- Maths lessons are regularly monitored by the Maths Co-ordinator and SLT as part of the School Improvement plan.
- Maths data is analysed termly by the Assessment Co-ordinator and the Maths Co-ordinator. Key issues are shared with staff and governors.

SCHOOL/STAFF DEVELOPMENT IN MATHEMATICS

The Mathematics team is responsible for:

- Keeping up-to-date with mathematical issues.
- Attending the LEA briefings for Co-ordinators.
- Attending designated courses for Co-ordinators.
- Providing feedback and advice to staff on mathematical matters.
- Implementing the school improvement plan.

Regular staff development is provided in staff meetings. This is facilitated by the Co-ordinator, with assistance from external consultants/ organisations when necessary.

EQUAL OPPORTUNITIES:

All children at Tinsley Meadows Primary School have equal access to the mathematics curriculum regardless of gender, race or ability.

Due to the school's high number of children with EAL needs, all staff have received extensive training designed to develop the use of EAL strategies during Mathematics lessons (Andy Harvey training, Talk Maths training). The use of these strategies is monitored through planning scrutiny and lesson observations by the SLT and Maths Co-ordinator.

We recognise that mathematics has its roots in many different and diverse cultures and links with these cultures are included in our teaching wherever possible.

POLICY REVIEW:

Staff review the way mathematics is taught in school on a regular basis, both in year group teams and as a whole staff. The next formal review of the policy for mathematics will take place within one year.