George Tomlinson Primary School

Mathematics Policy

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MATHEMATICS POLICY

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1. SUBJECT STATEMENT

Intent

At George Tomlinson, we believe that a firm foundation in mathematics is essential to everyday life and is integral to all aspects of life. It equips children with skills and tools which include logical reasoning, fluency, problem-solving and reasoning skills and the ability to be creative and adaptable thinkers. Therefore, we endeavor to ensure that children develop a positive and enthusiastic attitude towards mathematics that will stay with them and help them in the future. We aim to deliver an engaging curriculum that is fully inclusive and all children are encouraged by the belief that by trying their best, being resilient learners and working hard at maths they can succeed. We aim to plan and deliver high-quality lessons that have been carefully sequenced in order to ensure that lessons build upon one another in order to build children's engagement, enjoyment and curiosity about mathematics and in turn, help them to reach their full academic potential.

We expect our children to:

- develop their fluency skills
- develop a deep conceptual understanding of number
- think critically and clearly communicate their understanding and mathematical thinking
- make links and connections between previous learning or skills
- acquire and grasp mathematical understanding and knowledge using concise mathematical language
- use and apply their mathematical thinking in a range of contexts including real world contexts
- know key facts such as multiplication tables (see times table policy for further information) and addition facts within 10

Implementation

At George Tomlinson we have implemented the 'Mastery' approach using the five big ideas in Teaching for Mastery. As well as using the 2014 National Curriculum Programme of study, we use 'Inspire Maths' as a teaching tool. The programme follows a concrete – pictorial – abstract approach which ensures deep understanding of mathematical concepts during individual lessons and over time and we also utilise the White Rose Mastery scheme alongside the NCTEM online resources. This ensures continuity, progression and high expectations for attainment in mathematics for all children. Therefore, ensuring that lessons are planned and delivered to give children opportunities for maths mastery, which in turn gives them opportunities to acquire a deep, long-term, secure and adaptable understanding of mathematics.

Throughout the school day children engage in various activities to develop, strengthen and extend their mathematical skills. These include:

- daily fluency tasks/activities
- in-depth discussion and opportunities to develop reasoning skills in each lesson
- develop their knowledge and understanding of mathematical concepts whilst enabling them to practice new skills, strategies and methods learnt;
- provide children with opportunities to apply their mathematical skills in a range of contexts across the curriculum to make learning more meaningful and relevant;
- use of partner talk to develop mathematical thinking and develop speaking and listening skills
- opportunities and time to respond to marking
- instant feedback throughout the lesson

- developing their ability to solve problems and provide sound reasoning – both of which are essential in mathematics and everyday life
- developing their understanding of the importance of Mathematics in everyday life situations
- online resources such as SumDog and Times tables Rockstars
- high expectations of outcomes in terms of quality of work/learning as well as non-recorded outcomes
- lessons with a clear purpose that is shared with the children. Learning intentions should be simple and child friendly. Teachers may not want to share an explicit LI at the start of the lesson if the lesson is an exploratory one.
- At the start of a new topic children have an exploratory task or investigation to engage children (e.g. related to real-life, problem-solving question or illustrations –see Inspire Maths examples).

Impact

As a result, we provide children with an engaging mathematics curriculum and high-quality teaching to support and encourage children to become numerate, creative, independent, inquisitive, enquiring and confident mathematicians. As significant time is spent developing deep knowledge of the key ideas, children are able to be adaptable and use and apply their learning in a range of contexts and problem-solving activities. Through making connections and having a deeper understanding, children develop deep learning that can be sustained over time. They develop the skills required to gain more knowledge and understanding of the world around them and build on what they already know. Therefore, children leave our school as successful and confident mathematicians.

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2. TEACHING AND LEARNING

EYFS

Children in Reception follow the Foundation Stage Curriculum for Mathematics. In Reception children learn Maths in a wide range of contexts both indoors and outdoors. Continuous provision allows children the opportunity to follow their interests and explore different aspects of Mathematics independently (see Early Years and Year 1 Maths Policy)

KS1 and KS2

Children are taught through whole-class interactive teaching, where the focus is on all children working together on the same lesson content at the same time. As a result, all children can master concepts before moving to the next part of the curriculum sequence. Mathematics is taught using the Mastery mixed attainment approach. Medium term plans are based on the National Curriculum, Inspire Maths units and White Rose and set out the learning that needs to be delivered. Children also have opportunities to use and apply their mathematics knowledge in other areas of the school curriculum which include Project-based learning. In all years, except for year 6, children will be taught in mixed attainment groups.

There will be opportunities for developing fluency within lessons, including a Daily fluency session as starter three times a week. Children will also complete a weekly times table test (see times table policy). Teachers use long-term planning and progression documents to ensure coverage.

Year 1

In Year 1 pupils are taught through a daily maths interactive whole class session and in small focus groups alongside continuous provision both outdoors and indoors (see Early Years and Year 1 Maths Policy).

Structure of a unit

Lesson 1: New vocabulary should be introduced and explicitly taught. Lesson should focus on children exploring the concept and being introduced to the resources they will be using within that unit. There will be opportunities for exploration using manipulatives, problem-solving and reasoning.

Concrete – Using practical resources children will explore and develop their understanding of the concept or method being taught.

Pictorial – Children will begin to deepen their understanding of the concept and be able to move thinking on towards the abstract. Children will use drawings and jottings to show their thinking and working out.

Abstract – Taught written methods.

Fluency – Mathematical thinking is ongoing and will support children in developing their fluency across the unit.

Once children are secure in the basic skills, variation should be used to deepen children's understanding by providing a variety in the resources used and questions given.

Layout of a lesson

Lesson should begin with a starter activity or warm-up when vocabulary and concepts from previous lessons can be quickly revised at the start of one lesson there will be a times table/ number bonds/ *Fluent in Five* questions –with the fifth question being a problem solving question, where possible, giving the children an opportunity to draw a bar model.
Key vocabulary – recap of the key maths vocabulary and sentence stems being used within the lesson.
The children should follow the think, share, practice model during the shared session.
After the shared session, children will complete their independent learning. There will be next step activities and challenge activities for children who have finished to embed and deepen their learning further. During the week the children will have opportunities to peer/self-mark and also opportunities to reflect on their learning.

Planning

Year groups will plan using the long-term, medium term planning for their year group and use a weekly planning sheet to be placed at the front of their flipchart planning.
Lesson plans and lessons should include:

- Learning Intention and Success Criteria
- Shared learning activities: Think, Share, Practice (following the Inspire Maths and supplemented with White Rose and NCTEM resources).
- Common Misconceptions
- List of the key vocabulary & resources
- Outcomes for all abilities
- Open-ended challenge
- Plenary which could incorporate reflection.

Flipchart plans should include sufficient detail, which include some of the key questions to allow them to be followed by any teacher.
There should be opportunities to practice and develop mental maths strategies. Some ideas for teaching and practising mental maths strategies include: using a number target board, looking at times table strategies, singing songs, making up rhymes and raps, playing games such as snap, pairs, bingo as well as using online materials.

Mathematics across the curriculum

In order to raise standards in mathematics, it is vital that the significance of links to mathematics outside of the maths lesson is made clear. As well as making cross curricular links within mathematic lessons and using real world experiences, key mathematical concepts should be practised, used and applied in a range of contexts and subjects.

Possible cross curricular links include:

Art – Symmetry, properties of 2D and 3D shapes, shapes and patterns, use of paint mixing as a ratio context

English – sequencing events in chronological order, comparison of 2 data sets with a focus on vocabulary

Food technology– mathematics scales, measuring ingredients, recipes as a ratio context,

Geography – representing data, use of Spreadsheets

History – timelines, sequencing events

Computing – representing data; use of Spreadsheets

French – Dates, sequences and counting in other languages

Religious Education – interpretation and comparison of data gathered from secondary sources e.g. of developing and developed world

Physical Education – symmetry, sequences and patterns, measuring time/ distance

Science – sorting using Carroll/ Venn diagrams, measuring time, capacity, mass, length

Design and Technology – scales, measuring using practical equipment, proportion

Target setting

At the start of each topic, children in years 2-6 are given unit cover sheets which contain the unit targets for that topic outlining what they will be learning and they will be referred to throughout the unit. At the end of the week/unit the children will have the opportunity to go back to their target page and reflect on their learning. The target sheet includes boxes next to the targets to allow children to tick whether they think they are 'emerging', 'expected' or have 'mastered'. Teachers will then go back and also tick where they think the child is. In year 2, the class teacher will only do this. Targets are based on the key objectives. These are taken from Inspire Maths planning, National curriculum expectations for mathematics and Target Tracker. The end of term assessments will assess children based on these key objectives.

Maths Environment

Maths working walls should be used as working walls. Working walls should include key vocabulary – introduced at the beginning of the unit, sentence stems and working models. As teachers model to the children how to a specific method they should be adding these modelled examples to the working wall. The working wall should reflect the strand children are currently working on and should be updated as the units changes and progresses. They can also show examples of children's learning.

Resources
During the lesson, the children will have access to a range of manipulatives and resources which include: Cuisenaire rods, counters, place value counters, Numicon, bead strings cubes, dice, coins etc. These will be in maths boxes, wallets or trays.

Parental Support
The support of parents is essential if children are to achieve their full potential in maths. To support this partnership we provide:

- Workshops to equip parents with the skills and knowledge to support their children with maths at home
- Half termly year group newsletters where key areas of learning are shared as well as guidance on suitable websites and effective ways that parents can support their child with their learning at home
- Information on each child's present attainment and what they need to do to make progress.

At George Tomlinson Primary School we know that children make their greatest progress in mathematics when home and school work in partnership. At the 'Meet the Teacher' at the beginning of the year mathematics standards and expectations are explained for the relevant year group. Regular meetings throughout the year also keep parents informed (see Assessment Policy).

We encourage parents to:
- Encourage children to learn and practice their times tables at home
- Attend our parent workshops on mathematics
- Support children with completing their maths homework, which includes an online option (Sumdog)

3. EQUAL OPPORTUNITIES

All children have equal opportunities to reach their full potential across the mathematics curriculum, regardless of their race, gender, cultural background, and ability, or of any physical or sensory disability.

4. INCLUSION

All children are provided with equal access to the mathematics curriculum. We aim to provide suitable learning opportunities regardless of gender, ethnicity or home background. Through the maths mastery approach, each child will follow the same mastery journey and small steps approach to ensure they have mathematical knowledge and lessons will be scaffolded to support learners and opportunities to extend learners through activities and challenges for the more able. However, some children with SEND will require further differentiation and scaffolding. There is an individual section on the weekly overview of the maths flipchart plan which will include an outline of the support and resources that will be used within the lesson.

Where possible, year groups will provide intervention sessions for children who show a need for additional support in Mathematics.

English as an additional language (EAL)

Children who are new to English are assessed and support is put in place to help them with their language acquisition. Where children are identified as needing additional support to meet age-related expectations, the school offers a range of intervention support strategies, including:

- small group teaching
- key vocabulary
- precision teaching

In the classroom flipchart planning will include pictorial representations and concrete apparatus is always on the table. Teachers use strategies such as giving EAL learners thinking time to process, using gestures, scaffolded talk, differentiated questioning to support EAL learners.

There are also sessions and workshops which children and their families can attend that will support with mathematics at home. Please see EAL Policy for more.

SEND

Some children experience learning differences which affects their progress in mathematics. Class teachers inform the SENDCo and Inclusion Manager if they are concerned that a child may have underlying learning differences. The child is observed and assessed, sometimes by outside agencies and support is put in place (see SEND Policy). See above for the list of interventions the school offers.

5. ASSESSMENT

Children are assessed formatively to ensure teachers understand where children are currently in their learning and what their next steps need to be. In addition, regularly timetabled summative assessment opportunities are planned into the academic year to ensure that the progress in knowledge and skills is accurately tracked and measured using Target Tracker steps. This helps teachers to track and monitor progress of individual children through the academic year. Target Tracker formative statements are updated throughout the year and summative steps are updated three times a year to track progress towards end of year expectations (see Assessment Policy).

A range of tools including marking and feedback will be used as formative assessment for pupil progress in maths:
Assessment of pupil progress should be carried out on a daily basis and inform future planning. Assessment for learning should occur throughout the maths lesson, enabling teachers and teaching assistants to adapt their teaching/input to meet the children's needs. The following support effective formative assessment:

- Effective questioning
- Interactive teaching strategies, such as the use of individual whiteboards and the showing of thumbs
- Opportunities to reflect on learning, for example through a mid or end of lesson plenary
- Opportunities for self or peer assessment where the children are encouraged to acknowledge successes and to identify areas for improvement for themselves and others
- Mini plenaries to address misconceptions

Regular verbal and written feedback should be given to children to ensure that they are aware of their targets and ways to reach these. Pupil's work should be marked in line with the Marking Policy. Green highlighter should be used to tick correct equations and questions that have been solved. Pink comments should be used to identify areas for improvement and highlight misconceptions. At times it is appropriate for children to self-mark, or peer-mark as long as feedback is given on any areas of misconception and the children's learning is reviewed by the teacher before the next session.

Children should have regular opportunities to use self-assess/ peer assess against the learning objective and success criteria, giving them a sense of success (see Marking and Feedback Policy). Children should know when they are meeting their targets and should be regularly evaluating these too.

At the end of the half term children in years 2-6 are given a test comprised of questions related to the key objectives covered. This will allow teachers to assess if children are able to meet the targets independently. Teachers will then use this assessment to help them update target tracker.

In years 3-5, children will complete an Inspire Maths/White Rose end of unit test at the end of each term/half term based on the units taught. This will correlate with Target Tracker and results should be used to update the system. At the end of each term children will complete the NFER test and attainment profiles will be updated. Children in Year 6 and 2 are tested using past SATS papers (see Assessment Policy).

Years 1-5 will also explicitly teach times tables and each year group will follow Rainbow Maths (see Times table policy). At the start of the year there will be a baseline test, Spring 2 a 'check' times tables test and at the end of summer 2 an 'end of year' times table test. Year 4 undertake the statutory Multiplication Tables Check (MTC) in the summer term.

6. THE ROLE OF THE SUBJECT LEADER

The role of the subject leader in Mathematics is to coordinate the teaching of mathematics across all phases of the school. This is in order to secure high quality mathematics provision for every child, including outstanding teaching and learning, effective use of resources and the highest standards of achievement for all.

Some key duties that the Mathematics subject leader should undertake over the course of the year include:

- Monitoring of mathematics books
- Learning walks and other lesson observations where necessary
- Planning and organising mathematics enrichment opportunities and competitions
- Helping identify and facilitate the professional development needs of staff
- Liaising with SLT to help implement school improvement priorities
- Liaising with the school SENDCo to best support children with mathematics difficulties
- Organising, maintaining and cataloguing resources
- Keeping abreast of new initiatives in the teaching of mathematics