



Mathematics Policy

Towngate Primary Academy

Subject Leader: Amy Bateman

Introduction

At Towngate Primary Academy, we ensure we follow the aims from the National curriculum for Mathematics 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.

Intent

At Towngate Primary Academy, the intent of our mathematics curriculum is to design a curriculum which is accessible to all, allowing all children to make sense of the world around them by developing their ability to calculate, reason, solve problems and think in abstract ways.

Our curriculum is formed from the objectives set out in the Programmes of Study from the National Curriculum, Development Matters and the 'Maths Hub' schemes in order to structure our curriculum, ensure consistency across the academy and to support staff subject knowledge. In line with the National Curriculum and Development Matters, the Maths Leader has constructed a progression grid to clearly outline the progression of knowledge, skills and vocabulary across the academy. Within the Maths Hub schemes of learning, each National Curriculum objective is broken down into fluency, reasoning and problem solving; our teachers use the learning challenges to teach for mastery. We use a Maths Mastery approach to broaden and deepen mathematical understanding by using concrete apparatus to reveal the structures and by promoting discussion and explanation. Our teaching staff use the Maths Hub scheme of work in conjunction with a range of high quality resources such as NRich and NCETM to support, stretch and challenge all learners within the classroom. Staff subject knowledge is further supported through use of the resources from the National Centre for Excellence in the Teaching of Mathematics (NCETM).

Our Mathematics curriculum intends to maximise the development of every child's ability and academic achievement by delivering daily lessons that are creative and engaging – allowing them to know more and remember more. We want our children to know that Maths is essential to everyday life and, as they progress, have an appreciation of the beauty and power of maths. The expectation is that the majority of pupils will move through the Programmes of Study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils'



understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich mastery and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on

As our pupils progress further in their education, we intend for them to be confident mathematicians who are able to understand the world, have the ability to reason mathematically and have an appreciation of the beauty and power of mathematics – preparing them for a successful working life.

Implementation

At Towngate Primary Academy, our approach to the teaching of mathematics develops children's ability to work both independently and collaboratively. Every class from EYFS to Y6 follows the White Rose scheme of learning which is based on the National Curriculum. Lessons may be personalised to address the individual needs and requirements for a class but coverage is maintained. In order to further develop the children's fluency, reasoning and problem-solving, we use NCETM and NRich which correlate to the White Rose lessons and further develops children's understanding of a concept and the links between maths topics.

In Early Years, Mathematics involves providing children with opportunities to develop and improve their skills in the six key areas of early maths; cardinality and counting, comparison, composition, pattern, shape and space and measures. All areas of the provision have mathematical activities for the children to access as well as daily focused maths sessions.

At Towngate, we recognise that in order for pupils to progress to deeper and more complex problems, children need to be confident and fluent across each yearly objective. To ensure children know more and remember more, all maths lessons begin with a brief, daily review of prior knowledge and offer the time to introduce new subject specific vocabulary.

Maths is a subject specific lesson, which builds upon previously taught knowledge, skills and vocabulary covered in our progression grids. We aim to develop children's enjoyment of maths and provide opportunities for children to build a conceptual understanding of maths before applying their knowledge to everyday problems and challenges. Lessons include times table practice, daily reviews of previously taught skills, knowledge and vocabulary acquisition through guided and independent practice and opportunities to reason and problem solve in a secure learning environment.

Through each maths lesson, new content is taught through small steps to support children in their learning journey. This progresses into supported and independent practice for children to secure their new skills. Through mathematical talk, children develop the ability to articulate and discuss their thinking. We strive to ensure that children are taught to become competent mathematicians by embedding the skills and processes necessary to enable children to use and apply their Maths learning efficiently and in a variety of contexts. In order to advance individual children's maths skills in school and at home, we utilise Times Tables Rock Stars for multiplication practise and teach a weekly arithmetic lesson to increase speed and recall of key mathematical facts.

Teachers use questioning to elicit feedback from all students to expose and address any misconceptions in learning. Where these misconceptions are seen, they are readdressed through



supported practice to enable all children to succeed. Teachers use a range of tools to support children in knowing more and remembering more in maths. These include working walls, knowledge organisers as prompts on tables, vocabulary displays and steps to success. Over the course of the term, children will revisit and recall previous learning to identify gaps in learning which must be planned for.

Through our teaching we continuously monitor pupils' progress against expected attainment for their age, making formative assessment judgements and using these to inform our teaching. Summative assessments are completed at the end of each term; their results form discussions in termly Pupil Progress Meetings and update our summative school tracker. The main purpose of all assessment is to always ensure that we are providing excellent provision for every child.

Impact

Children at Towngate Primary Academy understand and value the importance of Mathematics, this is evident through pupil voice and monitoring which takes place every half term by the curriculum leader. We strive to equip our children with the skills to confidently make rich connections across mathematical ideas as a result of developing fluency, mathematical reasoning and competence in solving increasingly sophisticated, contextual problems during their time at Towngate Primary Academy. Children use their Mathematics skills as a key tool in helping them to learn, and as a result, know more, remember more and understand more.

Pupil voice, gathered by the Maths lead, will show that children talk enthusiastically about their maths lessons and speak about how they love learning about maths. They have a secure understanding of the key strategies, methods, and vocabulary for each key area of the curriculum and can articulate the context in which maths is being taught, relating this to real life purposes. Children show confidence and believe they can learn about a new maths area and apply the knowledge and skills they already have, understanding different representations they have been exposed to. Children have a developed understanding of the methods and skills of mathematicians at an age appropriate level.

Monitoring will show a clear progression of skills and vocabulary in line with the expectations set out in the subject progression grid. Books and lesson observations will show that pupils use acquired vocabulary in maths lessons, they have the skills to use methods independently and show resilience when tackling problems. Pupils, at an age appropriate level, are flexibly and fluently able to move between different contexts and representations. The children have a high level of pride in the presentation of their work and have a quick recall of key mathematical facts and procedures. Children are able to produce work which evidences good progress from their last point of statutory assessment and their starting points.

Through high quality first wave teaching, guidance and effective feedback, children will achieve age-related expectations by the end of each year group and some children will have progressed further to achieve greater depth. Summative assessment takes place at the end of each term and children's progress and attainment is discussed with senior leaders in pupil progress meetings. Attainment and outcomes in mathematics have a prominent focus throughout our academy. By the end of Key Stage Two, children will leave our academy prepared for the next step in their mathematical education equipped with secure, long-term, deep and adaptable understanding of maths which they can apply in different contexts.



Curriculum planning

At Towngate Primary Academy, we use the Programmes of Study set out in the National Curriculum alongside the Maths Hub schemes to help us with the planning and delivering of Mathematics. Our planning is set in two phases:

Long term plans - These plans map out the Maths units that will be covered in each half term for each year group. Teachers follow the Maths Hub schemes to structure their teaching sequences to ensure that all units are covered. The Mathematics curriculum leader is responsible for the expectations set out in the subject progression grid to ensure progression throughout each year group.

Medium term plans- These plans list the specific learning objectives that will be covered in each lesson. These plans are shared with SLT and the Maths Lead lead each half term.

Lesson plans - Lessons follow a clear structure based upon Rosenshines Seven Principles of Instruction. Lessons include vocabulary flash cards, daily reviews of previously taught skills, knowledge and vocabulary acquisition through guided and independent practice.

Guidance and Feedback

The use of guidance and feedback is to ensure that children receive positive and constructive feedback that will move their learning and understanding forwards. See Guidance and Feedback policy.

Learning environment

Teachers promote a stimulating and enriched learning environment where children feel safe to take risks, learn from their mistakes and understand that hard work and effort make a difference. In every classroom, we have a maths working wall which facilitates learning. Vocabulary and modelling of different methods are displayed on there. In order to further promote independence, staff provide resource scaffolds on the working wall so that the children can use them to support their learning. In Foundation Stage, there is a Mathematics area that is set up by the class teacher and the children decide on which resources and tasks they would like to complete.

Mathematics Resources

Each classroom will be resourced with materials to support the delivery of Maths; such items might include number lines, place value counters, dienes, multiplication tables, 100 squares, 2D and 3D shapes, multilink cubes, Numicon, dice and other smaller items. Larger materials such as scales, trundle wheels and measuring cylinders will be held centrally. Children should be encouraged to use whatever resources are available to them in the classroom and which they feel would be beneficial to help them when completing Maths work.

Homework

Early Years: Children will receive weekly homework linked to the current focus, this is in the form of games to be played at home.

KS1 and KS2: Children will be provided with weekly maths homework, which will consolidate key skills previously taught in school. Children will also be expected to practice their times table set by their class teacher each week.

Please see Homework Policy.



Reasonable Adjustments

Towngate Primary Academy recognises the importance of ensuring that children with identified Special Educational Needs and/or Disabilities have access to an ambitious mathematics curriculum. Within the curriculum area of mathematics, SEND children will be provided with reasonable adjustments through their tasks and level of challenge provided. Advice can be sought from the school's SENDCO where applicable.

We develop an inclusive curriculum through:

- **Setting suitable learning challenges:** It is the aim of the school that children should be given achievable learning targets, and be motivated by success. This may involve deepening children's mathematical skills and understanding, so that all children's learning needs are catered for, and pupils achieve as high a standard as possible.
- **Responding to pupils' diverse learning needs:** Mathematics is planned so that all pupils can take part in lessons fully and effectively so that there is an equality of opportunity through teaching approaches and planned so that potential barriers to learning and assessment for individuals and groups of pupils are overcome.

This is achieved through:

- Provision being made where necessary to support individuals or groups of pupils to enable them to participate effectively in mathematics lessons.
- Pupils' understanding being developed through the use of all available senses and experiences.
- Aspects of the Programmes of Study that may present specific difficulties for individuals being identified.
- Support to access texts (e.g. audio or larger print).
- The use of alternative communication methods e.g. ICT or speech.

In assessment, judgements allow for the provision described above.

Assessment

Children will be assessed in maths rigorously throughout the year.

- Foundation Stage make assessments which are ongoing throughout the year, including their Early Years Baseline.
- Upper Foundation Stage complete statutory Early Years Foundation Stage Profiles during Summer 1.
- In KS1 and KS2, pupils will complete maths assessments at the end of each term. These will inform the next steps of learning and allow Target Tracker to be updated at key points against age related expectations;
- Year 2 and Year 6 will complete the statutory maths test in Summer 1, as well as similar assessments throughout the year.
- Year 4 will complete the statutory multiplication check in Spring Term, as well as similar assessments throughout the year.
- Teacher assessment of maths is completed using a range of evidence from maths sessions and summative assessment. Judgements are made and recorded on Target Tracker at key, agreed times.

Teaching Structure

<p>1. Begin a lesson with a short review of previous learning.</p> <p>Reviewing previously learned material strengthen the connections between pieces of knowledge. A review of the previously covered material in maths may include flashcards, terminology, bingo, Flashback 4, If this is the answer, what is the question.</p>
<p>2. Present new material in small steps with student practice after each step.</p> <p>New material is presented in mathematics through a process of small steps and 'thinking out loud': this allows the teacher to model the new learning in smaller chunks before allowing the children to have a go in a 'my turn, your turn' scenario giving time for both guided and independent practice.</p>
<p>3. Ask questions and check answers</p> <p>To learn something, students need to practice it. Every time students answer a question or solve a problem, they retrieve that information, memory for that information becomes stronger and more last-longing. The more variety of question types, the better.</p>
<p>4. Use high quality models</p> <p>Children are exposed to a variety of concrete examples and models throughout their learning process. High quality models are used to set an expectation for pupils to demonstrate the expected standard for the year group. Models are used in whole class and small group teaching to guide mathematical thinking and processes.</p>
<p>5. Guided practice</p> <p>Within mathematics, student practice is guided through a process of 'thinking out loud'; this ensures that pupils are provided a commentary for selecting effective and efficient strategies and use of appropriate resources in order to be successful as independent mathematicians.</p>
<p>6. Check for understanding</p> <p>Check for understanding helps teachers assess learning and understanding. Throughout lessons, teachers ask direct and carefully selected questions to extract learning and successfully identify misconceptions. Staggered starting points are in place to enable children to understand the knowledge taught at the appropriate time. Live guidance and feedback allows all staff to assess understanding during lesson time and identify ways of moving learning forward.</p>
<p>7. Obtain a high success rate</p> <p>This principle relates to making sure all students have mastered the current set of lessons before moving on to the next one. It involves checking for misconceptions and asking questions. Throughout a series of maths lessons, children have time to practise a skill and become competent by progressing through fluency, reasoning and problem solving activities.</p>
<p>8. Provide scaffolds in difficult tasks</p> <p>Through the use of working walls, representations, cue cards, worked examples and models and resources children are provided with opportunities to overcome barriers and independently develop their skills. Staff used within a classroom support pupils in their learning and promote independent practice.</p>
<p>9. Stimulate and monitor independent practice</p> <p>It is our expectation that children become independent in their practice; independent practice should be used after guided practice. That is, when students are becoming competent in a topic, they can practice independently in order to become fluent and retrieve information automatically.</p>
<p>10. Conduct weekly and monthly reviews</p> <p>Frequent reviews of previously taught material helps children to reconsolidate information and create stronger connections. To review learning, teachers use low-stake quizzes and vocabulary reviews.</p>

Staff development

Over the course of the academic year the mathematics subject leader monitors and evaluates:

- The attainment and progress of pupils in Maths
- The pupils response and attitude to Maths
- The quality of Maths teaching in school
- The quality of children's work in Maths

This is achieved through:

- Classroom observation of Maths, including learning walks, with written feedback
- Questioning of children during these observations



- Discussions with pupils
- Carrying out regular scrutiny of work, and feeding this scrutiny back to teachers.
- Keeping all staff informed on changes that effect Maths in school.
- Attending any Maths Subject Leader training from the Maths Hub or NCETM.
- Arranging for staff to attend relevant training through the MAT or Maths Hubs.

Subject development

The Maths leader will:

- Ensure the subject of Maths meets statutory requirements of the National Curriculum.
- Continue to monitor the implementation of the Maths scheme of work and progression grid.
- Continue to monitor staff development in Maths, through classroom observations if appropriate, staff questionnaires, monitoring and feeding back on observation and children's work.
- Attend appropriate courses, if available, to develop personal knowledge and expertise, and to share this in school.
- Complete pupil discussions with pupils from a range of classes, on how Maths is delivered in our school.
- Maintain the Maths section of the school website for all stakeholders.
- Monitor and evaluate the quality of Maths resources in school, and bring in new resources as appropriate.