

Mathematics Policy

Reviewed April 2022



The Stour Academy Trust

Introduction

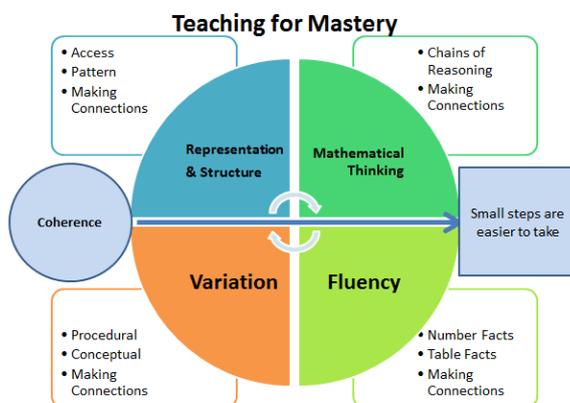
This policy outlines the aims, organisation and management for the teaching and learning of mathematics within The Stour Academy Trust.

Mathematics is a life skill. It is an essential element of communication, widely used in society, both in everyday situations and in the world of work. “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” (*National Curriculum 2014*).

Intent

By the time children leave our Trust, all children will be fluent, be able to reason and problem solve. Our maths curriculum follows elements of Mastery teaching. At the centre of our maths vision is the belief that all children have the potential to succeed, and learning should be accessible to all within an inclusive approach, technology will be used to enhance this. We will begin our maths topics throughout the year with a review of the previous year’s ‘ready to progress’ objectives, we believe that all children, where possible, should have access to the same curriculum content and should deepen their conceptual understanding by tackling challenging and varied problems.

The principles of a Teaching for Mastery Approach are:



Coherence	Representation and Structure	Mathematical Thinking	Fluency
Lessons are broken down into small connected	Representations used in lessons expose the	If taught ideas are to be understood deeply, they	Quick and efficient recall of facts and procedures



steps that gradually unfold the concept, providing access for all children and leading to a generalization of the concept and the ability to apply the concept to a range of contexts.	mathematical structure being taught, the aim being that students can do the maths without recourse to the representation.	must not merely be passively received but must be worked on by the student: thought about, reasoned and discussed with other.	and the flexibility to move between different contexts and representations of mathematics
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Variation

Variation is twofold. It is firstly about how the teacher represents the concept being taught, often in more than one way, to draw attention to critical aspects, and to develop deep and holistic understanding. It is also about the sequencing of the episodes, activities and exercises used within a lesson and follow up practice, paying attention to what is kept the same and what changes, to connect the mathematics and draw attention to mathematical relationships and structure.

Our intent focuses on equipping all pupils with the mathematics they need to master the curriculum for each year group, which requires that all pupils:

- recall key number facts with **speed and accuracy** and use them to calculate and work out unknown facts;
- develop their ability to **apply** mathematical skills with confidence and understanding when **solving problems**.
- apply 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
- express themselves and their ideas using the **language of mathematics** with assurance.
- have sufficient depth of knowledge and understanding to **reason and explain** mathematical concepts and procedures and use them to **solve a variety of problems**.
- develop **positive attitudes** to mathematics, recognising that mathematics can be both useful and enjoyable.
- nurture a fascination and excitement of mathematics
- can **use and apply** the skills in other curricular areas.

Our expectation is that most 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 the pupil's understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those children who are not sufficiently fluent with earlier materials should consolidate their understanding, including through additional practice, before moving on.



Implementation

Organisation

- In EYFS pupils experience mathematics daily, through teacher directed and adult initiated tasks and child-initiated play. Opportunities for mathematics should be developed through daily routines and all areas of learning.
- A daily mathematics lesson is taught in Year 1 and Year 2, through a challenge time approach and in KS2 a daily mathematics lesson is also taught, for some classes at various points in the day. Arithmetic sessions take place in the afternoons.
- Children in KS2 will practice their times tables, often using apps such as Times Table Rock Star outside of the maths lesson at least 3x a week and for homework. They will self-manage when they access TTRS within the school day, as long as this is achieved over the week.
- Problem solving and reasoning activities will take place regularly, enhanced by the use of technology to help remove any communication barriers. Including: immersive reader to make problems accessible to all, Collaboration Space, Flip Grid to pose and respond to questions, White Rose or teacher made video (a demonstration of your knowledge using screen record, manipulatives etc), audio.
- MineCraft can be used in KS2, where appropriate to support children's mathematics learning.
- Pupils are taught within their classrooms and the outside areas. Mathematics Collaboration spaces are available in each classroom, which includes, group whiteboards, manipulatives, flexible seating and technology. This will ensure resources are accessible for all children if they require it and children can independently choose which one are appropriate to use.
- The skills acquired in the maths lesson are applied across the curriculum.

A typical KS2 45- 60-minute lesson may include:

<u>Lesson Phase</u>	Outline/strategies to consider using (not all at once!)
Either prior or at the start of the lesson	Pre-teaching and assigning competence (prior, likely to be during morning work) Support video or screen recording to provide feedback or to consolidate from previous learning or working 1:1/small groups with an adult 'Flashback' activity
Review	At the beginning of each lesson, a review may take place to address any group/ whole class misconceptions from the previous lesson or re-visit prior learning through One Note. Any new vocabulary may be introduced (5 mins) and explored through games or strategies such as a Freyer model. Include a vocab bank in the child's section on class one note, pages



		labelled by units e.g., fractions page. So children can refer to this at any point.
Anchor task	In Focus	<p>A problem or stimulus is presented to pupils through OneNote (this may be personalised for individuals or groups), and they are encouraged to explore it. This may be taken from the 'In Focus' MNP tasks, or a diagnostic question may be used from a variety of resources (such as www.diagnosticquestions.com, Testbase, Deepening Understanding resources, WR questions from the previous year group or lesson).</p> <p>The teaching staff use this time to observe pupils and prompt for further exploration with questioning. Children's responses will be text, handwritten, audio, video etc. Children should be able to use immersive reader if needed.</p>
	Let's Learn and guided practice	<p>The teacher gathers pupil's ideas for solutions within groups or whole class (including the use of technology to support collaboration) and this is discussed. During this time, new concepts are then introduced using a CPA approach as per the CPA calculation policy.</p> <p>Guided examples are provided for reinforcement.</p> <p>The above learning may take place on a mini whiteboard or in KS2 on children's class One Note. Other groups at this point may be working with another adult or be using videos to support their learning.</p>
Independent practice		Pupils work through well-structured exercises which consolidate the concepts, problem solving and reasoning which has taken place in the lesson. Questions are typified by their mathematical variation- they are designed to extend pupil's thinking rather than just being lots of examples presented in the same kind of way.
Challenges		Depending on pupil's own self-assessment, in consultation with the teachers, will be able to choose to challenge themselves. This may also include using manipulatives to justify thinking and using photos, video, text or audio to present this.

Assessment for learning throughout the session to refer to Learning Objectives and/or a co-constructed Success Criteria, address misconceptions, identify progress, to summarise key facts and ideas, clarify what needs to be remembered, to make links in other work and to discuss next steps in learning.

Teaching strategies

In order to provide the children with active and stimulating learning experiences, a variety of teaching and learning opportunities are adopted: -

- Children may work individually on a task, in pairs or in a group, depending on the nature of the activity.
- Wherever possible, practical 'real world' and 'authentic audience' activities are used to introduce concepts and reinforce learning objectives.
- Opportunities to transfer skills learnt, to real situations, are used whenever possible.



- Activities are planned to encourage the full and active participation of all pupils using technology to enhance the learning wherever possible.
- A CPA approach is utilised in all year groups, all classes have access to a range of mathematical manipulatives to support learning and understanding. A CPA calculation policy is followed by all year groups.
- Teachers place a strong emphasis on correct use of mathematical language; this is supported by key vocabulary which is explicitly taught and children revisit when needed. KS1 this would be on working wall and KS2 OneNote.
- Throughout the school, children learn number facts and times tables using exciting videos and songs daily, alongside NumBots and TTRS.
- All children are given the opportunity to apply knowledge of concepts through problem, reasoning and challenge, the use of manipulatives will enable all children to explain their strategies.

Curriculum Planning

Long Term Planning

Teachers will use the Trust's Long-Term planning which is based on the White Rose Maths resources. Mathematical topics will be taught in blocks so that children can master each mathematical concept and apply it across a range of contexts.

Medium Term Planning

Teachers will use the Trust's Medium Term planning outline which uses the National Curriculum to teach sequences that build learning over time (based on the planning produced by the White Rose Maths Hub). The emphasis is to develop a sequence of teaching and learning that encompasses the cycle of assess, plan, teach, practise, apply, and review through every unit. A strong emphasis on Using and Applying including reasoning in mathematics is embedded within the curriculum.

'Ready to progress' objectives from the previous year group will be assessed prior to moving onto the current year group objective. This will be achieved through formative assessment throughout the lesson and possibly the use of White Rose assessments. The DfE document "Teaching Mathematics in Primary Schools"

<https://www.gov.uk/government/publications/teaching-mathematics-in-primary-schools> will support this process, as it identifies priority areas of the primary maths National Curriculum that form the essential building blocks necessary for pupils to progress smoothly from Year 1 to Year 6. For each of these areas, the document also identifies what it calls 'ready-to-progress criteria' which are the concepts children need to master before they progress to the next year group. NCETM progression grids may also be used to support at this stage of planning.

Short term planning

- All teachers will use One Note to produce their weekly modelling/planning
- At the start of the week, these will include an outline for the week with learning objectives in One Note, outline activities for the maths starter, whole class/ group teaching focus, reasoning, problem solving, self-differentiation, key questions, and opportunities for Assessment for Learning and key vocabulary.



- These will be amended and updated based on assessment for learning and the needs of the class
- Teachers will also provide a TA 'assessment for learning/distance marking' planning document in One Note, which will be updated daily based on the assessments
- Teachers will also plan for regular pre-teaching sessions for identified children and how they will assign competence within their maths lesson. White Rose/ teacher-made bespoke videos or screen recordings may be used to support this through One Note.
- The Deepening Understanding website, the Diagnostic Questions website and Test Base may be used to support planning and activities provided for children, including anchor tasks.

Planning maybe monitored by the Headteacher, maths subject leader and senior management team when there are concerns within a lesson or children's outcomes.

Impact

Assessment, recording and reporting (please see Assessment policy)

Assessment takes place at three connected levels: short-term, medium-term and long-term. These assessments are used to inform teaching in a continuous cycle of planning, teaching and assessment.

Day-to-day assessments

Teachers will assess children's understanding, achievement and progress in mathematics using daily assessments, these are based on observations, questioning, quizzes and the marking and evaluation of work.

Teachers will make use of diagnostic questioning at different stages of pupil's learning, including prior to a unit beginning to identify misconceptions, during a unit of work to check these have been addressed and at the end.

Anchor tasks may also be utilised to enable teachers to observe children's responses and to prompt further exploration with questioning.

See **Feedback and Marking** policy for further details on NS marking.

Termly moderation meetings

See assessment policy.

Summative assessments

See assessment policy

Intervention programmes

Before thinking about maths catch up and/or intervention, what we will be taken into account first and foremost is children's mathematical well-being for future learning, including:

- building young children's confidence,
- their willingness to have a go,
- their mathematical self-esteem and enjoyment; and



- establishing firm relationships with the adults in school and with their families

The Leuven scale may be used for any children who we are concerned about.

The school operates a flexible approach to intervention programmes based on weaknesses identified in termly pupil progress meetings and through ongoing data analysis by the senior leadership and maths teams. Teachers use guided groups led by themselves and teaching assistants to tackle children's misconceptions in maths.

Pre-teaching and assigning competence is used with those children who are on the cusp or experiencing a degree of maths anxiety at least 3 times a week.

A structured early maths intervention will be used in EYFS, Years 1 and 2. This is called **1st Class @ Number**. The impact of this intervention will be tracked using the Sandwell assessments.

Number talks are used across the school- either as a maths starter, within the maths lesson or a few times a week outside the maths lesson with a small group of children. This may be used as a maths intervention as well, for example, a group of girls to boost confidence.

Maths games are utilised across the school in order to enable children to investigate and play with numbers, develop their own understanding and resilience without any pressure.

Greater Depth Pupils

Pupils demonstrate high ability in mathematics in a range of ways and at varying points in their development. Pupils who are gifted in mathematics are likely to:

- learn and understand mathematical ideas quickly;
- work systematically and accurately;
- be more analytical;
- think logically and see mathematical relationships;
- make connections between the concepts they have learned;
- find rules and identity and explain patterns easily;
- be able to visualise, imagine and explain properties of shape quickly;
- be able to apply their knowledge to new or unfamiliar contexts;
- communicate their reasoning and justify their methods;
- ask questions that show clear understanding of, and curiosity about, mathematics;
- challenge or question mathematical rules;
- prove/disprove rules/generalisations based on mathematical evidence;
- Create algebraic rules based on sequences and patterns
- take a creative approach to solving mathematical problems;
- sustain their concentration throughout longer tasks and persist in seeking solutions, absorbed in their work;
- be more adept at posing their own questions and perusing lines of enquiry;
- have an ability to work calculations/problems out in their head very quickly;
- Able to relate their understanding of maths to areas such risk and uncertainty;
- verbally articulate their strategies, findings, observations with peers/adults;
- apply mathematics to different contexts and environments;
- apply their mathematics to both routine and non-routine problems easily.



Equal Opportunities

- All pupils will have equal opportunity to reach their full potential across the mathematics curriculum regardless of their race, gender, cultural background, ability or physical disability.

Inclusion

The school's equal opportunities policy applies to the teaching of mathematics as to all other subjects.

Environment

It is important that both the whole school and classroom environment supports both the learning and teaching of mathematics.

The school aims to provide a mathematically stimulating environment:

- using working walls/information on One Note to support learning and teaching in a lesson or series of lessons.
- through interactive displays that promote mathematical thinking and discussion
- through displays of pupils' work that celebrate achievement, including WAGOLs ('What a good one looks like')
- by providing a good range of resources and manipulatives for teacher and pupil use.
- Maths collaborations areas
- AM enabling environment which is mathematics rich in EYFS and KS1

Homework

See **Homework** policy for further details.

