

# Mathematics Policy



Reviewed September 2018

## Introduction

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

It is based on Excellence and Enjoyment and the National Curriculum 2014 (NC) programmes of study (PoS).

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*).

## Aims

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

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

All of these must be age appropriate and within the PoS for their year group.

## Teaching Mathematics

### Organisation

- A daily mathematics lesson of 60 minutes is taught in Year 1 – 6.
- EYFS is being used for children at the foundation stage. At this stage pupils experience mathematics on a daily basis, through 'snacktime maths', teacher directed tasks and child initiated play. This early introduction to mathematics will generally be undertaken orally and often in the context of a class theme, e.g. a particular story. Opportunities for mathematics should be developed through daily routines and all areas of learning.
- Daily, all children will practice their times tables using their Rock Star avatars as part of our new Times Tables Rock Stars challenge alongside watching and joining in with Percy Parker videos, which are songs focused on learning times tables.
- Pupils are taught within their classrooms, the ICT suite and the outside areas.

- The skills acquired in the numeracy lesson are applied across the curriculum.

A typical 60 minute lesson will include:

- Arithmetic and recall of number bonds and times tables  
This will involve whole-class or group work to enable children to become fluent in mental and oral maths skills.
- A main teaching activity  
This will include both teaching input and pupil activities and a balance between whole class, guided group work, paired and individual work according to need. There will be a focus on reasoning and problem-solving.  
Children may work in mixed or ability groups according to the intended learning outcome.
- Mini-plenaries throughout the session which may involve work with the whole class to refer back to Learning Objective and/or 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 small group, depending on the nature of the activity.
- Wherever possible, practical 'real' 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.
- Teachers differentiate tasks throughout the lesson in order to meet the needs of all abilities. Self differentiation is used regularly in order for children to challenge themselves.
- Teachers place a strong emphasis on correct use of mathematical language; this is supported by key vocabulary being displayed.
- All year groups will use manipulatives and children will be encouraged to access these independently when appropriate.
- Teachers value pupils' oral contributions and create an ethos in which all children feel they can contribute.
- Throughout the school, children learn number facts and times tables using exciting videos and songs daily. Whole school displays are used to encourage children to learn and recall rapidly facts which will support their maths learning.
- Reasoning and problem solving skills are taught explicitly by teachers as part of maths lessons in order to model the use of correct mathematical vocabulary and written reasoning.

### **Teaching methods and approaches**

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 small group, depending on the nature of the activity.
- Where possible, children will be sat in mixed ability groupings and a self-differentiation approach will be used.

- A 'Routeway' through calculation has been agreed. The mental and written methods taught are exemplified in the attached 'Calculation Policy'.
- The Singapore Bar Method will be used in all Year groups and is outlined in the attached 'Calculation Policy'.
- Computing is used where appropriate by teachers and pupils to support teaching and learning in Mathematics.

### **Differentiation Strategies:**

It is important to note that differentiation does not mean 'different work' but instead refers to the wide variety of resources, teaching styles, classroom activities and support materials that can be used by teachers to help make the curriculum accessible and allow pupils to progress within their lessons.

The Trust's Policy is that children are not sat in ability groups and work follows the 'Self-differentiation' approach where children select the work they will complete and all children are challenged. It is an important value of the Trust that differentiation not be used to 'straight-jacket' children and hinder them from achieving above what may be expected. See self-differentiation guidance for more information.

### **Curriculum Planning**

#### **Long Term Planning**

Teachers will use the Trust's Long Term planning which is based on the White Rose Maths Hub. All 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.

#### **Short term planning**

- All teachers will use PowerPoint or Notebook to produce their weekly planning
- At the start of the week, these will include an outline for the week with learning objectives, outline activities for the mental and oral, whole class teaching focus, reasoning, problem solving, self-differentiation, use of ICT, key questions, and opportunities for Assessment for Learning through mini-plenaries 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 planning sheet which will be updated daily based on the assessments
- Teachers evaluate their Powerpoint/Notebook files daily, making any necessary changes to provide additional input, challenges etc

*Planning is monitored by the Headteacher, maths subject leader and senior management team.*

### **Assessment, recording and reporting**

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**

As part of the ongoing teaching and learning process, teachers will assess children's understanding, achievement and progress in mathematics using the Distance Marking sheet. Daily annotations, which inform day to day teaching and learning, are based on observation, questioning, informal testing and the marking and evaluation of work. This will also enable appropriate feedback to children and TA planning for the following day.

Green stampers will be used to mark children's work by the teacher and TA. Any children who have not met the learning objective, will be identified on the Distance Marking sheet with a clear idea of how the child's needs will be met either in Catch Up Stay Up or the next lesson and this will be clear.

See **Feedback and Marking** policy for further details.

Learners will also be taught to assess and evaluate their own achievements by recognising successes, learning from their own mistakes and identifying areas for improvement. Class teachers regularly update Target Tracker, assessing every pupil against the objectives from the National Curriculum. At the end of each term, class teachers - for years 1-6 - will input a mathematics level (based on the Target Tracker steps) into Target Tracker. The amount of progress made and percentages of those children on track to reach National Curriculum end of year targets will be analysed and discussed at pupil progress meetings. Progress from Key Stage 1 will also be closely monitored in Key Stage 2 classes. This will also be discussed at 1:1 assessment, Pupil Progress and SLT Strategy meetings.

### **Termly moderation meetings**

The process of moderation is an essential part of a robust assessment system. Teachers are involved in moderation of EYFS, and core subjects in KS1/2 in the following ways:

- With colleagues in school during year group meetings
- With colleagues in school during professional development meetings
- With colleagues from the collaboration (twice termly timetabled sessions)
- Via attendance at statutory LA meetings
- Via LA representatives coming into school for moderation

### **Summative assessments**

Summative assessments are carried out in Year 6 termly (week 2) and in all other year groups at the end of term 2 and 5 in order to assess and review pupils' progress and attainment. This enables attainment to be tracked and will inform provision maps and planning. Gap analysis will be carried out and used to inform planning.



## Intervention programmes

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. When needed, teaching assistants lead short daily intervention programmes outside of the numeracy hour based on the Overcoming Barriers and Closing the Gap materials. 'Making Maths Magic,' 'Numicon', and 'Numbers Count' might be used in Key Stage 1. 'Springboard' may also be used in Key Stage 2. A flexible daily session also takes place informed by needs arising from the morning's teaching with the aim of ensuring that children are making the maximum level of progress and gaps are closed.

## Gifted and Talented

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.

Some pupils who are gifted in mathematics perform at levels that are unusually advanced for their age; however, not all pupils with exceptional mathematical potential will demonstrate it in this way. For example, pupils may have high levels of mathematical reasoning but be unable to communicate their ideas well orally or in writing. Sometimes gifted mathematicians reject obvious methods and answers as too easy, and opt for something more obscure.

Teachers will provide enrichment and extension activities and observe pupil responses to challenging activities.

## **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 the classroom environment supports both the learning and teaching of mathematics.

The school aims to provide a mathematically stimulating environment:

- through the use of working walls 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 WAGOLLs ('What a good one looks like')
- by providing a good range of resources and manipulatives for teacher and pupil use.

In every classroom, resources such as number lines, hundred squares, place value counters, double-sided counters, place value charts and multiplication squares are displayed as appropriate and used for whole class or individual work. Children are encouraged to access these independently.

## **Homework**

We recognise the importance of making links between home and school and encourage parental involvement with the learning of mathematics.

Homework provides opportunities for children

- to practise and consolidate their skills and knowledge of mental arithmetic methods;
- to share their mathematical work with their family;
- to prepare for their future learning.

Children in Years 1-6 receive a short piece of mathematics homework each week. This will be differentiated and every other week will be focused on Times tables and/or number bonds.

See **Homework** policy for further details.