



**EXPLORE DREAM DISCOVER ACHIEVE**

## **MATHS POLICY**

**FEBRUARY 2017**

# Stourport Primary Academy

## Maths Policy

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**Approved by:** Head teacher, Staff and Governors

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## Introduction

The purpose of this policy is to describe our practice in the teaching and learning of mathematics and the principles upon which this is based. This policy reflects the values and philosophy of Stourport Primary Academy in relation to the teaching and learning of Mathematics.

This policy is intended to be used in conjunction with the National Curriculum, Early Years Foundation Stage Guidance and Development Matters which specifies what pupils in different year groups are taught. Additionally, the school's 'Progression in Written Calculation' policy sets out the expectations and progression for teaching and learning written methods across all four operations.

## Purpose of study

At Stourport Primary Academy we fully endorse the following statement from the National Curriculum for Mathematics (2014) which promotes mathematics as a life skill.

*"Mathematics is a creative and highly interconnected 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."* National Curriculum 2014

## Aims

We endorse the aims of the National Curriculum (2014) which are 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.

In order to **foster positive attitudes to mathematics**, we aim for our pupils to

develop:

- an appreciation of the creative aspects of mathematics;
- an ability to think clearly and logically with confidence;
- a sense of achievement, enjoyment and an eagerness to learn more;
- ownership of their learning.

In order to **enhance personal and social skills in mathematics**, we aim for our pupils to develop:

- initiative and an ability to work both independently and in cooperation with others;
- an ability to think for themselves and generate their own questions;
- an ability to communicate mathematics;
- a desire to overcome problems with determination.

In order to **secure facts, skills and concepts in mathematics**, we aim for our pupils to develop:

- an ability to solve problems, to reason, to think logically and to work systematically and accurately;
- an understanding of mathematics through a process of enquiry and experiment;
- an ability to use and apply mathematics across the curriculum and in everyday life.

## **Mathematics in the Early Years Foundation Stage**

All children start Reception class in September with different mathematical experiences. Therefore, teaching includes a wide variety of techniques in order to ensure all children learn at their own level and appropriate pace. Teaching is delivered through purposeful play, with a balance of adult-led and child-initiated activities. During the spring and summer terms, more adult led activities are planned and delivered with continuous provision always at the forefront in order to encourage children to use skills learned in their own purposeful play.

The learning and development requirements from the new EYFS framework state,

*'Mathematics involves providing children with opportunities to develop and improve their skills in counting, understanding and using numbers, calculating simple addition and subtraction problems; and to describe shapes, spaces, and measures.'*

The early learning goals assessed at the end of the school year from the new EYFS framework are:

**Numbers:** children count reliably with numbers from 1 to 20, place them in order and say which number is one more or one less than a given number. Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer. They solve problems, including doubling, halving and sharing.

**Shape, space and measures:** children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems. They recognise, create and describe patterns. They explore characteristics of everyday objects and shapes and use mathematical language to describe them.

The Reception class is organised to promote the social skills and developing mathematical understanding of young children through stories, songs, rhymes, finger games, board games, sand and water, construction on a large and small scale, imaginative play, outdoor play and playground games, cooking, shopping and other role-play, two and three-dimensional creative work with a range of materials, and by observing numbers and patterns in the environment and daily routines.

Our aim is to prepare children, by the end of Reception, for the dedicated Mathematics lesson of that will be part of each day in Year 1.

## **Mathematics at KS1 - National Curriculum Statement**

*The principal focus of mathematics teaching in key stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the 4 operations, including with practical resources [for example, concrete objects and measuring tools].*

*At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.*

*By the end of year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency.*

*Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1.*

## **Mathematics at Lower KS2 – National Curriculum Statement**

*The principal focus of mathematics teaching in lower key stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the 4 operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.*

*At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number.*

*By the end of year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work.*

*Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word-reading knowledge and their knowledge of spelling.*

## **Mathematics at Upper KS2 – National Curriculum Statement**

*The principal focus of mathematics teaching in upper key stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio.*

*At this stage, pupils should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.*

*By the end of year 6, pupils should be fluent in written methods for all 4 operations, including long multiplication and division, and in working with fractions, decimals and percentages.*

*Pupils should read, spell and pronounce mathematical vocabulary correctly.*

## Planning Overview

Each teacher is responsible for the mathematics in their class in consultation with the Mathematics Coordinator. We follow the guidance from the National Curriculum which states that:

*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 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.*

There is no set requirement at Stourport Primary Academy regarding the format of planning, however a separate document, 'Planning Guidance for Mathematics', is available to support teachers in their planning. To ensure a broad and balanced curriculum, teachers implement the plans for the relevant year group, differentiating objectives to meet the needs of all learners in their groups. Copies of the Maths Curriculum document and grids to enable long term planning can be found in 'All Staff' in the Maths Coordinator Folder in the V drive.

Teachers have access to a range of published and online resources, including Hamilton Trust, White Rose Hub and the Collins Maths scheme (in KS2) which support the planning, teaching and assessing of mathematics.

## Class Organisation

Class teachers are responsible for their own class organisation and teaching style in relation to Mathematics, while at the same time ensuring these reflect the overall aims and philosophy of the school. At Stourport Primary Academy we adopt a flexible approach to grouping. Children are taught in mixed ability classes for most of the time but within the class group (or across the two parallel class groups) children will regularly work in different groupings in order to:

- Promote social skills;
- Encourage independence;
- Introduce new topics or activities;
- Allow individuals to develop skills and concepts at their own pace;
- Aid effective learning and understanding.

## Lesson Structure

Each child in Years 1 to 6 will receive a daily mathematics lesson of at least 60 minutes. In addition to this, extra sessions are timetabled to enable pupils to consolidate key facts, develop fluency and practise test papers.

The daily lessons have a flexible structure, often including:

**oral work and mental calculation**

whole class work to rehearse, sharpen and develop mental and oral skills;

**the main teaching activity**

learning objectives are shared,

teaching input and pupil activities,

work as a whole class, in groups, in pairs or as individuals;

**a plenary or mini plenaries**

work with the whole class to sort out misconceptions and identify progress, to summarise key facts and ideas and what to remember, to make links to other work and discuss the next steps and to set work to do at home.

Flexible teaching encourages sequencing learning objectives across several lessons which may result in no formal plenary one day or no mental and oral starter another. Mini-plenaries throughout lessons are effective as a way to check learning during the activity rather than solely at the end.

## Teaching Styles

Our approach to teaching is based on five key principles:

- dedicated mathematics lessons every day;
- direct teaching and interactive oral work with the whole class and groups;
- an emphasis on mental calculation;
- an emphasis on developing independence and depth of learning;
- controlled differentiation, with all pupils engaged in mathematics relating to a common theme.

A separate document, 'Teaching Guidance for Mathematics', is available to support teachers in their planning.

## Marking, Assessment, Recording and Reporting

Pupils' work in mathematics will be marked daily. For more detail on marking, see the school marking policy.

### **In the short term, assessment is carried out by:**

- Teachers identifying misconceptions and using these as a teaching point.
- Making comments on written work which aim to improve children's work and show achievement. Comments are sometimes written in the form of questions and pupils are expected to respond to these questions either by writing a response directly after the comment or by talking to the teacher. Where the question has been answered verbally, a 'V' is recorded in the pupil's book as evidence of this.
- Children taking responsibility for their own learning by using the traffic-light system of self-assessment and sometimes writing a reflective statement about their learning.

### **In the medium term, assessment is carried out by:**

- Teacher's evaluations and assessment informing their planning to move children on and build on learning.
- Identifying children's progress against specific individual targets, including provision maps and tracking into action records so you can give them and their parents feedback and set new targets and devise intervention where necessary.
- Providing information on weekly evaluation sheets to feed into termly and end-of-year assessments.
- Using SPTO to record the progress of each child on a half termly basis to monitor their progression towards age related expectation.
- Tracking progress throughout the year and recording at agreed key intervals.

### **In the long term, assessment is carried out by:**

- Teachers assessing progress at the end of year and making forecasts for the end of their Key Stage. This information is used to inform planning and grouping in the next year.
- Assessing pupils' work at the end of Key Stages 1 and 2 against National Standards;
- Giving supplementary information about individual children's attainment and progress for reporting to parents and the child's next teacher;
- Helping the school set targets for the National Curriculum tests for future years;
- Setting whole school curricular targets;
- Enabling the SIT to brief the governing body, the staff and others on overall progress and attainment in the school as a whole, including progress towards school and National targets.
- Informing parents on progress at annual individual interviews during the Spring term and written reports in the Summer term.

## **Tracking Into Action**

Pupils' progress in Mathematics is tracked every six weeks. Tracking is carried out by teachers within phases and the information is used to identify pupils' needs. Pupils not on track to meet end of year expectations are identified and discussed. Tracking into action sheets are consequently completed, detailing the areas of weakness and any interventions subsequently put in place. These interventions are reviewed half-termly and appropriate action taken.

## **Maths Across The Curriculum**

As a key part of our purpose is enabling pupils to see the value of mathematics as a life skill, we actively seek to promote using and applying areas of mathematics in other areas of the curriculum, for example:

**English**

- Maths vocabulary and technical terms;
- Number stories, rhymes and songs;
- Reading non-fiction in which charts or tables have to be interpreted.

**Science**

- classifying;
- counting;
- measuring;
- calculating;
- estimating.

**Art, Design & Technology**

- measuring, pattern, shape, space.

**ICT**

- data handling
- reading from scales
- Computer models and simulations require the ability to identify patterns and manipulate numbers.

**History, Geography and Religious Education**

- counting
- measuring
- time including time lines, calendars, annual festivals and special days
- map reading and the use of co-ordinates, direction position and angles

**Physical Education and Music**

- counting
- time
- symmetry
- movement, position and direction

## **Provision For Those With Special Educational Needs Including More Able**

Pupils work in mixed ability groups but lessons are planned and structured to ensure all learning is appropriate and challenging for all pupils. Teachers ensure teaching assistants are used effectively to support pupils who require additional support in Maths, though this isn't necessarily children with SEND. Children with SEND learn within the main group, but follow a supported and differentiated curriculum. As part of our policy for inclusion some children will have maths programmes/interventions included in their IEP/provision map. For our most able pupils we emphasise the importance of depth of understanding and mastery and encourage application of skill through challenging problem solving and reasoning.

### **Resources and Practical Maths**

A true understanding of mathematical concepts has its basis in practical exploration and problem solving. As new concepts are introduced, at whatever stage in the school, practical apparatus is positively encouraged as a first medium through which the children can grasp an understanding.

A firm grasp of concepts through practical tasks provides a firm basis for the transition to the theoretical. We aim to be well resourced for this practical work, with each classroom having an adequate supply of frequently used resources. Other, less frequently used, resources such as those for time or shape are kept in the Maths cupboard.

### **Parental Access and Involvement**

Parents are able to discuss mathematics with the class teacher/mathematics teacher and head teacher. Assessment of their child's work will be reviewed termly through meetings and reports. At appropriate times parents will be invited in to attend workshops and/or participate in mathematics lessons with their child.

## **Homework**

Establishing an effective working partnership with parents contributes to children's attainment and therefore, we aim at all times to encourage parents to take part in and give feedback about the homework.

Mathematics homework will usually be set in one of the following formats.

### **Maths to share**

For these activities it is expected that parents and children will work together. These activities will often involve doing some "home maths" and using household objects or money. This type of activity is important because it allows children to talk about their maths and to apply mathematical skills and knowledge to different situations.

### **Homework Exercises**

Here the child works independently on an activity designed to practise or consolidate the learning that has taken place in class. Parental assistance may be needed and parents are encouraged to talk to the child about their work.

### **Practise Tests**

Sometimes, particularly in Year 6, children will bring home examples of the test papers they will be sitting during their SATs. The purpose of this is for parents and children to gain an understanding of the style and format of the tests whilst being able to work on them in a non-test situation.

## **Monitoring Effectiveness**

Monitoring will be in line with and as determined by whole school policy. Examples of monitoring may include:

1. Analysis of results from the previous year/cohort.
2. Self-evaluation and action planning.
3. Lesson observations with an agreed focus.
4. Work scrutiny.
5. Planning Scrutiny.
6. Pupil interviews.

## Equal Opportunities

All teaching and non-teaching staff at Stourport Primary School are responsible for ensuring that all children, irrespective of gender, ability, ethnic origin and social circumstances, have access to the whole curriculum and make the greatest possible progress.

All children have equal access to the maths curriculum, its teaching and learning throughout the year. Day-to-day monitoring of the Maths curriculum is the responsibility of the class teacher. General monitoring is the responsibility of the Head Teacher and Maths Coordinator.

This policy is a working document and subject to regular review. Purple font is used to show amendments or sections needing change.

J. Lane (February 2017)