Maths Curriculum Policy

Lauren Armson

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At Low Road and Windmill Music Federation, we view Mathematics as a tool for everyday life; a network of concepts and relationships which provide a way of viewing and making sense of the world. We equip children to be curious about mathematics, making connections between concepts and reasoning mathematically. We foster analytical minds and confident communicators of information and ideas to tackle a range of practical tasks and real life problems. We therefore believe it is important to ensure all children have the best possible mathematics opportunities, including as a cross curricular learning tool. We have a commitment to high achievement in mathematics by children regardless of gender, race, class or disability.

Aims

We uphold and nurture the following underlying principles for the teaching and learning of mathematics in our school, aiming 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 and procedural 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, e.g. “Convince me that…” or “I know that…so…”
* 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.
* Are taught through the Concrete → Pictorial → Abstract sequence, to ensure that they gain a thorough understanding of the mathematical concepts / skills that they are learning.
* Should be given the opportunity for every relevant subject to develop their mathematical fluency and mathematical skills.

Using the Mathematics programmes of study from the 2014 National Curriculum, we aim to develop:

* A positive attitude towards mathematics and an awareness of the fascination of mathematics
* Competence and confidence in mathematical knowledge, concepts and skills
* An ability to solve problems, to reason, to think logically and to work systematically and accurately.
* Initiative and an ability to work both independently and in cooperation with others
* An ability to communicate mathematics and mathematically
* an ability to use and apply mathematics across the curriculum and in real life
* an understanding of mathematics through a process of enquiry and experiment

Outcomes

At KS1 and KS2, teachers plan their lessons following the statutory guidance and instruction of the Mathematics Curriculum 2014. Through careful planning and preparation we aim to ensure that throughout the school children are given opportunities for:

* Becoming fluent with mathematical knowledge
* Taking on challenges and reasoning mathematically
* Practical activities and mathematical games
* Problem solving
* Individual, group and whole class discussions, activities and decisions
* Open and closed tasks
* A range of methods of calculating
* Working with IPads / chrome books as a mathematical tool
* Embedding maths within other areas of the curriculum, as appropriate.

Scheme of Work

Our school scheme of work is a working document and as such is composed of:

* Long Term Plans, following the White Rose Mathematics Schemes of Learning, exemplifying the breadth of coverage across each year group.
* Medium term plans, following the White Rose Blocks. These plans progressively cover the programmes of study as set out in the Maths Curriculum 2014 for each year group.
* Ongoing plans produced on a week by week basis and reviewed daily as necessary. These are developed from the Medium Term plans, taking into consideration the needs of our pupils. They are based on the small steps objectives as outlined by White Rose Mathematics.
* Teachers in Foundation Stage base their teaching and learning on objectives within the Framework for Foundation Stage; this ensures that they are working towards the ‘Early Learning Goals for Mathematical Development’.

Each class teacher is responsible for the mathematics in their class in consultation with and with guidance from the Federation Maths Lead. The approach to the teaching of mathematics at TMF is based on these key principles:

* At least 4 carefully crafted maths lessons each week focussing on progression of a concept through procedural and conceptual variation, as necessary for mastery in learning
* An emphasis on fluency, reasoning and problem solving
* Readily available manipulatives to support concrete learning
* Exploration of concepts through mathematical discussion to identify children who may need additional support or opportunities to dive deeper
* Greater depth challenges for children who grasp a concept quickly

Teaching and Learning

EYFS

The teaching of maths in EYFS 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 shape, space, and measures. Children will develop their understanding through planned, purposeful play and through a mix of adult-led and child-initiated activity.

Pupils who grasp concepts rapidly will be challenged through having access to a wider variety of problems, whilst those children who are not sufficiently fluent will be given opportunities to further develop their understanding before moving on.

Key Stage One

The principal focus of mathematics teaching in KS1 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 four operations, including use of practical resources (e.g. 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.

Lower Key Stage Two

The principal focus of mathematics teaching in Lower Key Stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four 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.

Upper Key Stage Two

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 four operations, including formal methods of multiplication and division, and in working with fractions, decimals and percentages.

Pupils should read, spell and pronounce mathematical vocabulary correctly.

Lesson Structure

Each lesson is divided into distinct parts:

* A review of something previously learnt, a fluency activity or a problem to introduce the learning for that day that allows the children exploration and discussion time in mixed ability partners
* Guided practice where children are supported through the learning so that they are ready for independent work using an ‘I do, you do’ ping pong style.
* Independent practice where the children complete work in their books to apply the concepts taught that lesson
* Extension / challenge questions which are readily available for early finishers to provide an opportunity for deeper thinking
* A plenary activity where children can apply their knowledge to solve the problem

In addition:

* Weekly arithmetic tests for Years 5 and 6 (to begin once four operations have been taught) to build arithmetic skills to develop automaticity
* ‘Fluent in Five’ daily arithmetic questions (KS2) to build fluency and confidence (2 – 3 times a week)
* Times Table Rock Stars for Y2 – 6 (2 - 3 times a week)

Mathematical Resources

All classrooms have a number of mathematical, age appropriate resources to support teaching using the C-P-A approach. Shared resources are stored in the maths resource cupboard located in the KS2 corridor for staff to access.

Displays

Each classroom has a maths display relating to current work. The maths display should be presented to the pupils as a ‘working wall’ and should be updated regularly to reflect the unit of work currently being taught. Working walls include: key vocabulary, current learning objectives, examples of methods and calculations, challenges, visual maths, examples of children’s work and interactive opportunities.

Differentiation and Support

In a mastery approach, differentiation occurs in the support and intervention provided to different pupils, not in the topics taught. In the main, there is no differentiation in content taught, but the questioning and scaffolding individual pupils receive in class as they work through problems will differ; higher attaining pupils are challenged through more demanding problems which deepen their knowledge of the same content. Pupils’ misconceptions are identified through immediate formative assessment and addressed with rapid intervention – ideally through individual or small group support later the same day or the following morning.

Pupils with specific educational needs attend a maths SEND group. All children have their individual needs met through differentiated work in conjunction with targets.

Marking

Marking is supportive, encouraging and motivational thus informing future learning. See Marking Policy.

Teachers focus on:

* Accurate modelling to correct misconceptions
* Teacher / pupil verbal dialogues to overcome misunderstandings
* Children have time each day to reflect on and respond to the teacher’s marking of the previous day’s learning – ‘red pen’ time. The children themselves also engage in self-marking as part of their learning; they are taught and encouraged to check their own work. This fosters independence in the children, who can seek help if they are unable to locate and correct their errors

Assessment

* Formative assessment takes places daily throughout each lesson as an ongoing, diagnostic tool
* Teachers are expected to make regular assessment of each child’s progress and to record these systematically on Arbor
* Half termly end of block assessments (White Rose Y1 - 5, SATs papers Y6)
* Termly formal assessments (White Rose Y1 - 5, SATs papers Y6)
* Pupil Progress Meetings at the end of term’s 2, 4 and 6 focus on Teacher Assessments and target children in need of extra support or intervention

Parental Involvement

At TMF we encourage parents to be involved by:

* Informing them about the units of work that their child is studying through regular newsletters
* Inviting them to twice yearly parent consultation evenings to discuss the progress of their child
* Providing weekly homework to consolidate classroom learning

Monitoring

The Federation Maths Lead, alongside SLT, are responsible for monitoring and evaluating curriculum progress. This is done through book scrutiny, planning scrutiny, lesson observations, pupil interviews, staff discussions and audit of resources.

Review

The mathematics policy will be reflected in our daily practice. It will be reviewed every two years, or as and when it is necessary due to changes in the curriculum or implementation of government initiatives.

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