



Mathematics Policy (Teaching for Mastery)

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INTENT

Mathematics equips children with a uniquely powerful set of tools to understand and change the world. These tools include logical reasoning, problem solving skills and the ability to think in abstract ways.

The national curriculum for mathematics aims 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.

Mathematics is integral to all aspects of everyday life and with this in mind we endeavour to ensure that our children develop a healthy and enthusiastic attitude towards Mathematics that will stay with them. Mathematics makes a significant contribution to modern society:

- the basic skills of Mathematics are vital for the life opportunities of our children;
- Mathematics develops the mind and those highly valued cognitive skills.

By adopting a 'growth mindset' approach at Swallowfield Lower School our children are encouraged to believe they are all capable of learning and doing Mathematics. We believe that by nurturing this attitude we not only enable our children to progress through their education, but also lay the foundations for successful lives after school.

We aim to provide children with a Mathematics curriculum which will produce individuals who are numerate, creative, independent, inquisitive, enquiring and confident. Swallowfield Lower School has adopted the principles and features of a mastery approach to address the three aims of the National Curriculum – Fluency – Reasoning – Problem Solving. We recognise that

children need to learn basic number facts and acquire fluency in procedures, alongside developing conceptual understanding if they are to be able to solve increasingly complex problems in lessons and later in life. The mastery approach to the teaching of Mathematics adopted at Swallowfield Lower School means that we have high expectations of all our children. We endeavour to make the Mathematics curriculum accessible to all children; moving them through the programme of study at broadly the same pace. We believe all children need a deep understanding of the Mathematics they are learning to ensure future learning is built upon firm foundations. We also aim to provide a stimulating environment with a broad range of resources so that every child can develop their mathematical skills to their full potential.

To achieve our aims these aspects of Mathematics teaching will be seen in every classroom at Swallowfield Lower School:

- Adults displaying positive attitudes towards Mathematics and a sense of excitement about the subject
- Carefully planned lessons which ensure small coherent steps through the learning journey
- Children exploring maths through a Concrete, Pictorial, Abstract approach (CPA). This will involve children learning through active enquiry using concrete materials, seeing pictorial representations and exploring abstract forms of maths
- Children will experience and learn a range of representations and structures
- Children will be exposed to carefully selected variation to help dispel misconceptions
- Clear communication with precise mathematical language and stem sentences used
- Answers expected and given in full sentences
- Opportunities for fluency and flexibility of thought in every lesson
- Adults using skillful questioning to reveal, probe and address misconceptions
- Adults using carefully selected key questions to support learners and deepen understanding
- Children provided with opportunities to practice what they have learnt and independence encouraged
- Children who grasp concepts rapidly challenged to provide depth and breadth of study
- Scaffolding being provided for children when required
- Skillful assessment identifying children who are struggling to grasp concepts leading to same day intervention, in addition to the daily Mathematics lesson, so that everyone is ready for the next step.
- Mathematical skills being practised and applied across the curriculum
- Mathematically rich environments to support learning including Working Walls

IMPLEMENTATION

Early Years

In the Early Years Foundation Stage (EYFS), we relate mathematical aspects of the children's work to the expectations set out in the EYFS (2021) profile document. A mastery approach is adopted to mirror practice used across the whole school and elements of teaching for mastery are embedded into Early Years Maths planning. We aim to ensure that all children develop firm mathematical foundations in a way that is engaging, and appropriate for their age. We use resources linked to the Number blocks programmes to achieve this, and supporting materials enable staff to draw out and build upon the maths embedded within each episode. Mathematics development in Early Years includes Cardinality and Counting (the value of a numbers represents a quantity), Comparison (knowing what numbers are worth in order to

compare), Composition (understanding that one number can be made from two or more smaller numbers), Pattern, Shape and Measure.

Key Stage One and Two

In Key stage One and Two, planning materials delivered by a mixture of Maths No Problem and White Rose provide a framework for implementing the statutory requirements of the National Curriculum programme of study for Mathematics 2014. All planning is monitored by the Mathematics Subject Leaders and Key Stage Leaders. Short-term plans provide specific learning objectives for each lesson and outline how lessons are to be taught including the small steps, the deployment of adults, the resources needed, key questions to be asked, any anticipated misconceptions to consider, precise mathematical vocabulary to be used and the steps to success. Teachers in each year group plan together with individual teachers tailoring plans, resources and adult deployment to their specific class.

Key Stage One (Year 1 and Year 2)

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 four 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.

Lower Key Stage 2 – Years 3 and 4

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.

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.

Lesson Design

Mathematics is taught for one hour per day split between two sessions. Dividing the daily session in this way affords the optimum time to sustain children's concentration. At Swallowfield Lower School the teaching of Mathematics follows a consistent lesson structure:

- Exploration– all Mathematics lessons begin with children being encouraged to explore a problem themselves through the use of an ‘anchor task’. Lesson objectives are not always

shared with children at the beginning of the lesson because we wish the children to reason for themselves. At some point from the middle or even at the end of the lesson, the children may be asked to reflect on what they've been learning that day. Exploration is the time for using concrete manipulatives and talking and listening as children work through the presented problem. Children use a maths jotter to record their ideas and workings.

- Structuring- the teacher will organise the findings of the exploration, comparing and contrasting strategies to guide toward the most efficient strategy or the one being focused on that day.
- Develop reasoning and deep understanding (Reflect)– problems are usually set in real life contexts, carefully chosen representations uncover the structure of the maths (manipulatives and images) and are used by all to explore concepts.
- Practising (Independent Learning) - not drill and practice, but Intelligent Practice characterised by variation. The children work through questions which enable them to practise their current learning. The use of maths journals gives children additional opportunities to reflect on their learning and allows further Mathematics problems to be explored alongside strategies and reasoning.
- Key Questions to challenge thinking. Teachers use questioning throughout every lesson to check understanding – a variety of questions are used to foster different levels of thinking e.g. How do you know? Can you prove it? Are you sure? Is that right? What's the same/different about? Can you explain that? What does your partner think? Do you agree? Can you imagine? Can you convince me? Questions are also used to further challenge children who have grasped the concept. Children have opportunities to talk to their partners and explain or clarify their thinking throughout every lesson.

Swallowfield Lower School is a 'Mastery Specialist School and supports 12 other schools to develop their Maths teaching and learning. The Maths Leader (G McGill) is an accredited PD Lead and hosts Teacher Research Group Meetings (TRGs) every half term. During these meetings the group observe lessons at the host school using the 'Big Ideas' and feedback upon the features of teaching for mastery. In addition to this, every term the Maths Leader visits the Workgroup School to support them in delivering effective Maths sessions that demonstrate the features of teaching for mastery.

Resources

Each classroom has a wide range of concrete resources available and the Maths Subject Leaders consult teachers annually to evaluate the use and provision of resources. Every classroom has a Maths working wall which is interactive, clearly visible and provides the children with information about their current learning, key vocabulary and a range of appropriate strategies to choose from. It is expected that each classroom will have Mathematics on display to promote the subject for example number lines, number squares, fraction walls, decimal numbers, time, shapes, months of the year and days of the week.

IMPACT

All pupils are entitled to take part in continuous assessment, which is integral to the teaching process. This section details the various assessment methods and practices used in Swallowfield through which we ensure that children are making appropriate progress and that the activities they take part in are suitably matched to their ability and level of development.

Assessment is an integral and continuous part of the teaching and learning process at Swallowfield and much of it is done informally as part of each teacher's day to day work. Teachers integrate the use of formative assessment strategies such as: effective scaffolded questioning, clear learning objectives, effective feedback and response in their teaching and marking and observing children participating in activities. Findings from these types of assessment are used to inform future planning.

Children's progress, achievements and attainment are reported at parents' consultations during the autumn and spring terms and also twice a year through a written report. SATs results are available to parents at the end of Key Stage 1 and are used to inform assessment. Outcomes at the end of KS1 are assessed against the Interim Teacher Assessment Framework and are reported nationally and to the Local Authority. Outcomes at the end of Year 4 are also reported to the Local Authority.

Summative Assessment – (evaluating children's learning)

More formal methods are used to determine the levels of achievement of children at various times during the school year. We use termly assessments as a way of recording children's progress in objectives covered across that specific term. We use 'Rising Stars as an assessment tool. This information is then updated onto the child's maths assessment sheet and targets are updated.

A pupil really understands a mathematical concept if they can:

- Describe it in his or her own words;
- Represent it in a variety of ways (the CPA approach);
- Explain it to someone else;
- Make up his or her own examples;
- See connections between it and other facts or ideas;
- Recognise it in new situations.

Teachers produce reports to parents once a year and there are opportunities for parents to discuss work at the two parents' evenings or open classrooms. At the end of the academic year parents will receive a report on how well their child is doing in Maths. They will also receive their child's attainment level based upon the new curriculum, either 1 (emerging), 2 (expected) or 3 (exceeding).

ASSESSMENT

Assessment is regarded as an integral part of teaching and learning and is a continuous process. Assessments are used to inform planning and complete the evaluation cycle. It is the responsibility of the class teacher to assess all children in their class. Lessons are structured with opportunities for Assessment for Learning throughout. This enables teachers to evaluate what has been learned, review success criteria and address misconceptions. Opportunities for peer/self-assessment are also included so children understand what they have attained and what their next steps are. Formative assessment is undertaken on a daily basis and assessment information is gathered in a variety of ways, through: discussion, questioning, observation and the marking of children's work. Learning in books is presented and marked in accordance with Swallowfield Lower School Marking Policy. Teachers and Learning Support Assistants (LSAs) endeavour to mark work with children in the moment so that immediate feedback can be given. Planning is annotated to reflect which children have met the learning objectives and

which children require additional support. Assessment grids are highlighted throughout the year to inform and secure the judgement of every child's progress.

REPORTING

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MONITORING AND EVALUATION

Monitoring of the Mathematics curriculum, standards of children's work and the quality of planning is the responsibility of the Mathematics Subject Leader. Planning scrutinies, discussions with children and book-looks are conducted over the course of an academic year. The Senior Leadership Team are responsible for monitoring the teaching of Mathematics through teacher observations. The Mathematics Subject Leaders support the teaching of Mathematics throughout the school, inform colleagues of current developments and provide continued professional development opportunities through staff meetings and INSET training. The Mathematics policy is regularly reviewed by the Subject Leader. Any changes are presented to the Governing Body and Head Teacher for approval before being shared with teaching staff. The Mathematics Subject Leaders ensure that new members of staff are made aware of our approach to Learning and Teaching in Mathematics.

ADDITIONAL NEEDS

We aim to provide a rich mathematical education, which will develop the potential of all children. Any child who is assessed to have special education needs in Mathematics will have a Mathematics target on their provision map. Additional support and same day intervention, as well as additional interventions will be offered as required. Children who regularly grasp concepts rapidly and have been assessed as having mastered objectives from their year group may be identified by their class teacher as More Able. Planning for these children will focus on enrichment and the development of mathematical thinking rather than acceleration and covering content more quickly. Learning opportunities for both of these groups of children is clearly detailed on short term planning.