Robert Miles
Infant School

Maths Curriculum Intent

1. **Ensure children are fluent in Early Reading and Maths and are exposed to a rich vocabulary.**

We embrace the Mastery approach to teaching mathematics. We explicitly model, systematically teach and expect pupils to use a rich, varied and specialist mathematical vocabulary. Maths provides opportunities for pupils to practise and apply reading skills. We recognise the critical importance of children's earliest mathematical experiences and ensure fluency in those aspects of maths that correspond with later success in maths (for example pattern).

2. **Develop confident, caring children with positive attitudes to learning**

Our five attitudes to learning are embedded in maths teaching. Pupils are actively taught how to apply self-motivation, determination, resilience, willingness to learn and reflection to problem solving and reasoning challenges

3. **Offer a balance of knowledge and skills that ensure fast-paced progression across and between each year.**

Our curriculum is broken down and we present new learning in a series of simple small steps. We only proceed when those are mastered. Pupils who grasp concepts rapidly are challenged through being offered rich and sophisticated problems before any acceleration through new content. Conceptual understanding is fundamental and our emphasis on practise is part of achieving that understanding. Our curriculum is designed to maximize the likelihood that children will remember and connect the steps that they have been taught previously. We encourage pupils to see the connections. We develop progression as pupils move through the school, with increasingly complex problems over time. Teachers are aware of the previous and next steps in pupils' learning. We use *Rosenshine's 10 principles* to inform our classroom practice and limit cognitive overload to ensure pupils are storing learning in their long-term memory.

4. **Ensure that children are offered opportunities to develop fluency, problem solving and reasoning to ensure that knowledge is transferred to long-term memory.**

We strive to give pupils the understanding and the ability to recall and apply knowledge rapidly and accurately (Fluency) through varied and frequent practice. We teach and expect pupils to move fluently between CPA representations of mathematical ideas *(Bruner's constructivist theory)*. We present problems where there is not a standard procedure to follow. We expect pupils to appreciate the patterns of maths and reason mathematically. They develop an argument or justification and prove it using mathematical language, concrete, pictorial or abstract resources. We use variations in a sequence of questions to lead pupils to make generalisations about the structure of maths. Pupils apply the language and models of reasoning to other subjects, for example historical enquiry.

5. **Be creative and flexible, responding to children's interests and needs, including first-hand, meaningful experiences that engage them in their learning.**

We want our pupils to understand maths as a creative subject. Decisions about when to progress will always be based on the security of pupils' understanding and their readiness to progress to the next stage. Teachers are creative and flexible in how they plan, deliver and adapt maths teaching. We use concrete and pictorial resources in every lessons. We address misconceptions rapidly. We want to give pupils the foundation for understanding the world.

6. **Be accessible for all children regardless of their background, needs or abilities.**

We embrace the Mastery approach to teaching mathematics. We set very high expectations and expose pupils to the same curriculum. The expectation is that the majority of pupils will move through our maths scheme of learning at broadly the same pace as research *(EEF 2018 & Zwitzerlood 2015)* shows that pupils experiencing setting make less progress than pupils taught in mixed attainment classes. It is an adventure that the whole class are on together. We strive to develop a great sense of curiosity and enjoyment in maths from all our pupils. We provide adaptations that are different from and additional to general provision, to ensure the majority of maths lessons are accessible for all children. We use specialist assessments to identify potential causes of lack of progress or attainment in maths.

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Maths Curriculum Implementation

(What might an observer typically see in maths lessons?)

To ensure consistent coverage across the school, we use White Rose schemes of Learning. Our teaching staff use this document in conjunction with a range of high quality resources such as NRich and NCETM to support, stretch and challenge all learners within the classroom, with a focus on developing fluency of mathematical concepts for all pupils. We implement our approach through high quality teaching delivering a highly-structured small-steps approach for all pupils.

Teachers model strategies using our calculations policy. Teachers expect pupils to read and solve problems. They use sentence stems to model reading, saying and writing mathematical sentences. Pupils are taught to show their workings in a concrete fashion, before establishing ways of pictorially and formally representing their understanding. Pupils have open access to a wide range of mathematical resources in classrooms, including Numicon, Dienes and counters. Pupils are required to explore maths in depth and through variation, using mathematical vocabulary to reason and explain their workings. We dedicate the practice time necessary and build in time to rephrase, elaborate on and summarise new material to store it in pupils' long term memories. We also provide opportunities for overlearning – independent practice. Teachers continually check understanding through varied and deep questioning.

We provide adaptations that are different from and additional to general provision, to ensure the majority of maths lessons are accessible for all children. We expect pupils to access the same objective and content through personalisation and adaptations (e.g. reducing the level of reading required, concrete resources, scaffolding, differently evidenced learning). We provide pre-learning and post-learning to give some pupils extra processing time and to consolidate understanding.

We recognise that in order for pupils to progress to deeper and more complex problems, children need to be confident and fluent across each yearly objective. In addition to daily maths lessons all classes also have daily fluency lessons where they are given the opportunity to practise and embed the key skills for their year group *(Key skills to be agreed)*. This daily review or spaced learning helps strengthen connections and develop automatic recall to free up pupils' working memory for problem solving.

In lessons teachers will be limiting the cognitive load *(Rosenshine's 10 principles)* placed on pupils, simplifying the process of learning and using a range of set routines familiar and consistent across the school. We avoid split attention and do not simultaneously present verbal and written information using a range of strategies including silent modelling, pictorial representations. Our classrooms should only contain resources/displays that are likely to prove useful.

During a lesson we would see the gradual release of responsibility from Teacher to pupils. Research *(Graves and Fitzgerald 2003)* shows that pupils become independent learners by gradually assuming more and more responsibility for their learning.

We encourage resilience and acceptance that struggle is often a necessary step in learning. We use quizzes as an exercise to strengthen pupils' brains as research (EEF) shows that pupils are more likely to store learning in their long term memory if they have to think hard and struggle. We would expect to see an optimal success rate of around 80% as this shows learning and challenge (EEF)

We are part of the Trust network of maths leaders and the NCETM Maths Hub – Teaching for Mastery and we strive to develop our practice in line with theirs. We also take part in training opportunities and regional networking events.

EYFS

Key Stage One

Teaching throughout Key Stage One ensures that children are confident to manipulate numbers up to 100 by the time they leave our school. The Key Stage One curriculum provides opportunities for children to develop their competency in place value and the four operations. A high focus is placed on concrete, pictorial and abstract strategies (CPA) to equip children with a readiness for more abstract concepts to be introduced in Key Stage Two.

Key Stage Two

We work closely with our partner Junior school to ensure that we build solid foundations. From Year 3 they are introduced to formal calculation methods. We have worked together on a joint calculations policy and we regularly observe classroom practice in our partner school.

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Maths Curriculum Impact

(How are we measuring the curriculum's effectiveness?)

Summative assessment takes place at the end of each term and children's progress and attainment is discussed with senior leaders in pupil progress meetings. Formative assessment takes place daily 'in action' and teachers adjust planning accordingly. All teachers plan and teach flexibly in response to their class's needs. Teachers identify misconceptions and intervene swiftly to help pupils having difficulties to keep up. They achieve this while simultaneously deepening the learning of others in several forms: providing scaffolds (modelling, Talk out Loud, checklists, concrete models); provide fluency, reasoning or problem solving practice whilst working with those needing support; same day catch-up intervention; pre-teaching targeted pupils.

We use both summative and formative assessments to identify gaps and improve pupils' mathematical knowledge

Attainment and outcomes in mathematics have a prominent focus throughout our school. The teaching of mathematics is monitored frequently by leaders through lesson observations, book scrutinies and pupil interviews.

We will measure the impact of our curriculum through assessment procedures which allow us to measure maths outcomes against all schools nationally using:

- EYFS % of pupils achieving a 'Good level of development' (GLD) and the Maths ELG

- End of KS1 % of children working towards or at the expected standard and at Greater depth in maths as well as achieving EXS in all areas.

But the impact of our curriculum will not only be measured in this way. It will also be measured by how effectively it helps our pupils develop into individuals who embody our learning attitudes, particularly a self-confidence in and positive attitude to maths. We want our pupils to be given key skills in fluency and the knowledge that maths is creative and pattern seeking as ultimately we teach maths so they can use maths in everyday life.