Mathematics Policy

To ensure all children **enjoy** their learning and attending school.
To provide opportunities for children to **embrace** learning through real life, hands on experiences.
To prepare children to **evolve** into the next stage of their schooling.

INTENT

At Delph Side we believe that all children are able to succeed mathematically, and that one of our primary tasks as maths teachers is to find ways of presenting, scaffolding, and teaching concepts in such a way that everyone will achieve.

Mathematics 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.

We understand that our learners come from a wide variety of backgrounds with varying exposure to mathematical concepts and practical experience. As a result, they require robust and clear progression through mathematical concepts and support with learning. The goal of our Maths teaching is to deliver the core aims of the National Curriculum - both in the mathematics lessons and across the curriculum as a whole. Our children will be taught to be confident, successful and proficient mathematicians who can apply their Maths to other contexts and situations. We want our children to leave Primary school 'Secondary ready', with excellent foundations for future learning.

The national curriculum for mathematics aims to ensure that all pupils:

- become fluent in the fundamentals of mathematics;
- reason mathematically;
- can solve problems by applying their mathematics.

(National Curriculum 2014)

IMPLEMENTATION

At Delph Side, we use White Rose Maths schemes of learning, and their resources in order to provide a comprehensive and expertly designed journey though the world of Mathematics.

White Rose is based on a small steps approach that keeps all learners together. By using the resources across the school we can ensure consistency of the mathematical elements and comprehensive coverage of the curriculum. We believe that this approach will facilitate consistent delivery of Mathematics across the school and across the inevitable ability range within year groups. It is also designed to support mathematicians who require more time and visual representation to grasp fundamental concepts and those who require challenging further to achieve Greater Depth.

White Rose Resources support us to provide:

- CPA (Concrete / Pictoral / Abstract) representations.

- Variation (Procedural / Conceptual).
- Logical and effective small steps.
- Vocabulary.
- Manipulative usage.

White Rose resources support:

- All learners through a whole class learning approach.
- EYFS stage learning.
- Visual representation designed to show concepts clearly.
- Re-visiting of concepts.
- Bar models and PPW models for problem solving.
- Clear progression of calculation.
- Fluency of calculation and concept with 'Flashback 4' questions

Manipulatives are:

- Used purposefully and appropriately.
- They are available for appropriate lessons – this builds a mental picture of a mathematical concept.
- Manipulative use develops through concepts as the learner moves from EYFS to Y6 White Rose uses the Teaching for Mastery model as illustrated below. This has been developed by the NCETM 'Teaching for mastery'

Pupil support and differentiation

Taking a mastery approach, differentiation occurs in the support and intervention provided to different pupils, not in the topics taught, particularly at earlier stages. The National Curriculum states:

> *'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 little differentiation in the content taught but the questioning and scaffolding individual pupils receive in class as they work through problems will differ, with rapid graspers challenged through more demanding problems which deepen their knowledge of the same content. Pupils' difficulties and misconceptions are identified through immediate formative assessment and addressed with rapid intervention – commonly through individual or small group support during assembly time or later the same day.

'The Five Big Ideas' that underpin Mastery teaching are:

Coherence

Lessons are broken down into small connected steps that gradually unfold the concept, providing access for all children and leading to a generalisation of the concept and the ability to apply the concept to a range of contexts.

Representation and Structure

Representations used in lessons expose the mathematical structure being taught, the aim being that students can do the maths without recourse to the representation

Mathematical Thinking

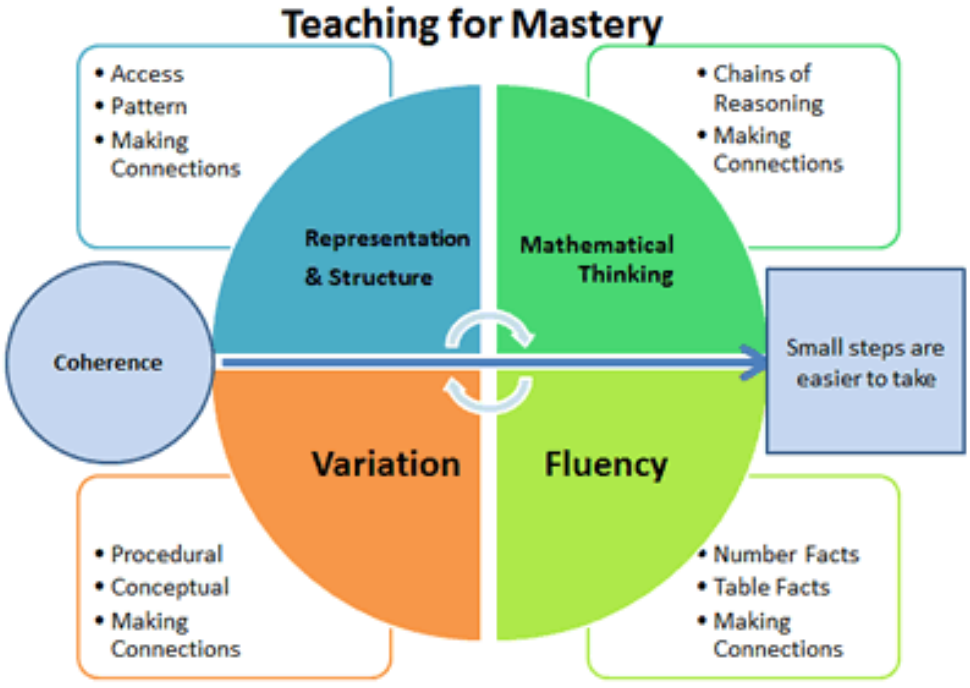
If taught ideas are to be understood deeply, they must not merely be passively received but must be worked on by the student: thought about, reasoned with and discussed with others

Fluency

Quick and efficient recall of facts and procedures and the flexibility to move between different contexts and representations of mathematics

Variation

Variation is twofold. It is firstly about how the teacher represents the concept being taught, often in more than one way, to draw attention to critical aspects, and to develop deep and holistic understanding. It is also about the sequencing of the episodes, activities and exercises used within a lesson and follow up practice, paying attention to what is kept the same and what changes, to connect the mathematics and draw attention to mathematical relationships and structure.



The Five Big Ideas were first published by the NCETM in 2017.

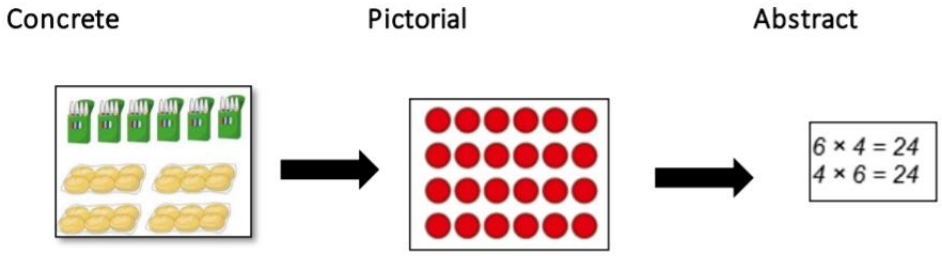
Concrete – Pictorial – Abstract teaching strategy

Children are encouraged to solve problems each day through the use of concrete resources, pictorial representations and abstract thinking.

Concrete is the 'doing' stage, using concrete objects to solve problems. It brings concepts to life as children have the opportunity to be hands on and use physical objects to aid them in developing their understanding.

Pictorial is the 'seeing' stage, where representations of the objects are used to support learning. This stage encourages children to make a mental connection between the physical object and abstract levels of understanding, by drawing or looking at pictures, circles, diagrams or models which represent the objects in the problem.

Abstract is the 'symbolic' stage, where children are able to use abstract symbols to model and solve Maths problems.



Area of Learning	Format/Structure
Fluency	• Flashback 4 (these are provided for each lesson) – use as early morning work/separate to the main lesson. • TT Rockstars used and monitored to support fluency facts learning
Vocabulary	• Vocabulary slide at the beginning of the lesson to discuss and reinforce key vocabulary. • New vocabulary is indicated in red. • Teachers model vocabulary throughout the lessons and expect to hear it in children's answers. • Children repeat new vocabulary then discuss/explain. • When revising vocabulary, give children the opportunities to explain or revoice meanings to a partner or the class
True / False	True/False – lesson opener completed on whiteboards and then discussed. Modelled answers and re-voicing is important.

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Core Maths learning **White Rose Maths booklets** **Maths Journals**	• Lesson progression is guided primarily by White Rose (WR) structure and small steps. • White Rose Booklets to be used to record learning. • All lessons to be planned to use the WR Teaching slides as a basis. • Video should be used to support teacher's understanding of the lesson content and model tasks and descriptive methods – not as the lesson. • Learning objective and key vocabulary for the lesson on the first slide. • Initial 'warm up' questions on WR slides to be completed in Maths recording books. • Key questions on slides in yellow. Children should answer in full sentences (using key vocabulary where appropriate). • Stem sentences should be highlighted in blue – children can chant/ pair repeat these. • Stems should be repeated on subsequent slides for use answering questions. • Children should be encouraged to use stems to explain concepts and ideas. • Challenging questions can be including on teaching slides as required. • Children to be provided with challenge questions when they have completed learning. • These should be available to access as required during lessons. • Children should be provided with opportunities to explain their understanding. • Challenge tasks should be completed in Maths recording books. • All Maths planning to be saved in a Planning Folder in Teachers on Teams. • Manipulative based lessons where there are less written outcomes can be recorded with photographs and a comment relevant to the individual child – what was the outcome for them – did they understand the small step? • Teachers / TAs can use post it notes to capture the child's understanding 'live'.
Feedback	• Live Marking can be used alongside teacher 'live' feedback • Self/Peer-marking can be completed in lessons in green pen • TAs should be writing in workbooks to show where a child has been supported with follow on questioning or a note to indicate intervention • Aspiring to resolve misconceptions through short intervention before next lesson
Assessments	• White Rose Maths - End of unit assessments

	• NTS assessments termly • Statutory testing – KS1/KS2 - Y2 and Y6. • Year 4 Times table check.
Personalised Curriculum	• Identified pupils may access White Rose maths lessons from a previous year group if they are not ready to progress • Maths Whizz online intervention and tutoring • Precision teaching • IEP targets

EYFS

EYFS follow the White Rose schemes of learning – principally securing the representations of numbers up to 10 and recognising number to 20. Children are encouraged to spot patterns and identify differences through variation. EYFS children begin their fluency journey by noticing and recalling numbers up to 20. EYFS practise is predicated on exploration and discovery with songs and repetition to secure foundational knowledge.

- There are opportunities for children to encounter Maths throughout the EYFS (both inside and outside) – through both planned activities and self-selection of easily accessible quality maths resources
- Towards the end of Reception teachers aim to draw the elements of a daily mathematics lesson together so that by the time children move into Year 1 they are familiar with a structured lesson / activity.

Parental Involvement

We encourage parents / carers to be involved by:

- Meeting with child's class teacher during the autumn and spring terms to discuss the progress of their child.
- Providing them with a yearly report about their child which includes attainment in mathematics.
- Adopting an open door policy for parents / carers to speak to their child's teacher at any point during the year, either informally or by making a specific appointment.

IMPACT

- Through the White Rose learning journey and the clear small steps approach, the teachers, support staff and the pupils assess their learning continuously throughout the lesson.
- At the end of the unit, block assessment tasks are completed, where children have the opportunity to reflect on their knowledge and understanding.
- Three formal assessments take place in a year using NTS assessments
- We are developing our assessment systems to enable teachers to make informed judgements about the depth of learning and the progress learners have made over time.

Monitoring and Evaluation

The following elements will be monitored

- Planning (Powerpoint of each lesson and sequence)
- Children's books
- Pupil conferencing and classroom practice visits through Learning Walks.

This monitoring will be fed back to staff and governors.

Learning Walks will be used to monitor classroom practice - including:

- Learning walls
- Pupil voice
- Delivery of learning
- STEM sentence use
- TA provision including intervention

The content and principles underpinning the 2014 mathematics curriculum and the maths curriculum at Delph Side Community Primary School reflect those found in high-performing education systems internationally, particularly those of east and south-east Asian countries such as Singapore, Japan, South Korea and China. The OECD suggests that by age 15 students from these countries are on average up to three years ahead in maths compared to 15 years in England. We learn from their education systems by adopting a 'mastery approach' to teaching commonly followed in these countries. These principles and features characterise our approach:

- Teachers reinforce an expectation that all pupils are capable of achieving high standards in mathematics;
- The large majority of pupils progress through the curriculum content at the same pace. Differentiation is achieved by emphasising deep knowledge and through individual support and intervention.
- Teaching is underpinned by methodical curriculum design and supported by carefully crafted lessons and resources to foster deep conceptual and procedural knowledge;
- Practice and consolidation play a central role. Carefully designed variation within this builds fluency and understanding of underlying mathematical concepts;
- Teachers use precise questioning in class to test conceptual and procedural knowledge, and assess pupils regularly to identify those requiring intervention so that all pupils keep up.

The intention of these approaches is to provide all children with full access to the curriculum, enabling them to achieve confidence and competence – 'mastery' – in mathematics.

Additional Related Documents:

- WRM Calculations Policies – Addition and Subtraction, Multiplication and Division
- Visual Representation Document

- Appendix 1: Guidelines for Pupils and Teachers
- Appendix 2: Mastery Approach Document for Visitors