



MATHS POLICY

To be reviewed annually by the Maths Lead

Date of last Review	Signature
02/10/2019	Hard copy on file

Vision Statement

Mathematics is a creative and highly inter-connected discipline that has been developed into centuries providing solutions 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 and appreciation of the beauty and power of mathematics and a sense of enjoyment and curiosity about the subject.

National Curriculum 2014

Here at Alford Primary School, we encourage children to have a 'Mastery' approach to mathematics, by being resilient, co-operative, creative, and most importantly, by having a positive attitude to making mistakes and being determined to seeking solutions. We encourage all children to develop their own mathematical understanding through arithmetical proficiency, reasoning and problem-solving skills. We strive for our pupils to be confident mathematicians who understand the relevance of the subject in their everyday lives.

Aims

We aim to develop lively, enquiring minds, encouraging pupils to become self-motivated, confident and capable in solving problems. 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 have conceptual understanding, and are able to recall and apply their 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.

Teaching for Mastery

In September 2018, Alford Primary School transitioned towards a Mastery approach to the teaching and learning of mathematics. We understand that this will be a gradual process and take several years to embed. The rationale behind changing our approach to teaching mathematics lay within the NCETM Maths Hub Programme, as well as the 2014 National Curriculum, which states:

- the expectation is that most pupils will move through the programmes of study at broadly the same pace;
- 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.

5 Big Ideas of Mastery

Our teaching for mastery is underpinned by the NCETM's 5 Big Ideas: coherence, representation and structure, mathematical thinking, fluency and variation.

Coherence

Lessons are broken down into small connected steps that gradually unfold the concept, providing access for all children and leading to a generalisation 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 needing the visual representation.

Mathematical Thinking

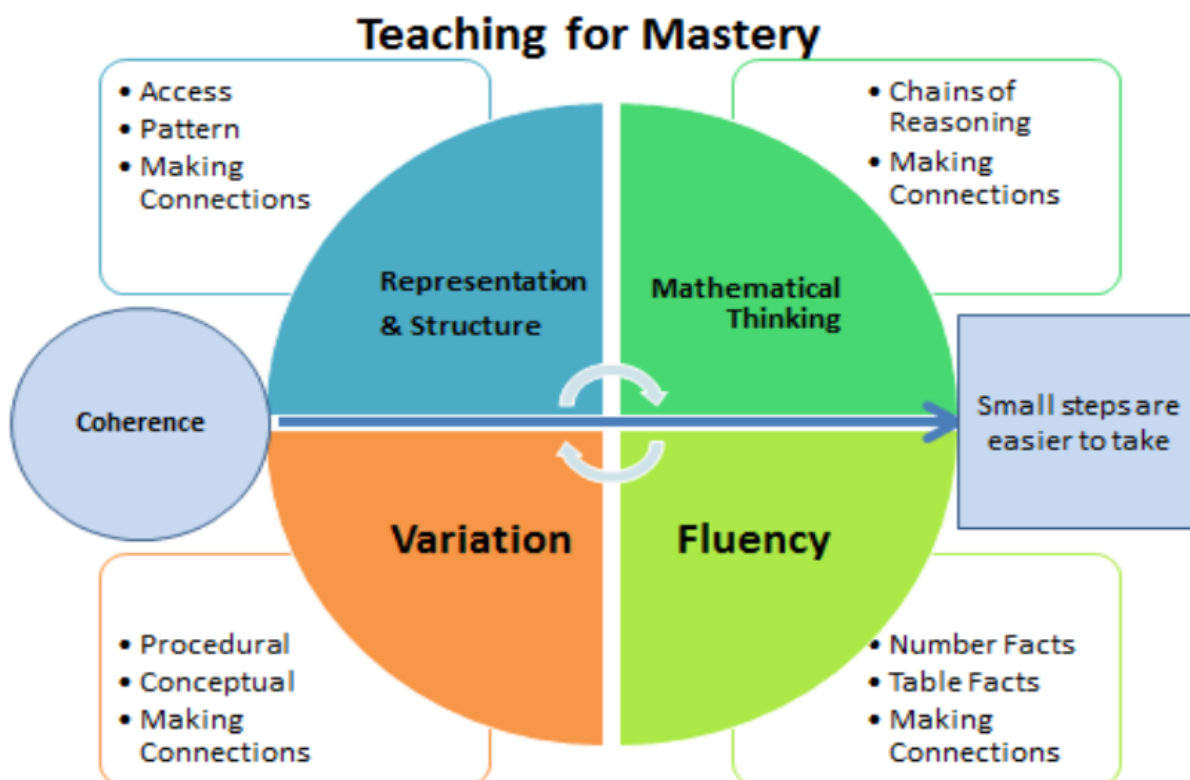
If taught ideas are to be understood deeply, they must not merely be passively received but must be worked on by the student: thought about, reasoned with and discussed with others.

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 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



Curriculum Design

To ensure consistency and progression across school, in September 2019 we decided to use the DfE approved Power Maths scheme for Years 1 to 6. The scheme fully supports a mastery approach and rejects the notion that some people simply 'can't do maths'. Instead, it develops growth mindsets and encourages hard work, practice, collaboration and a willingness to see mistakes as learning tools.

To develop Mastery in maths, children need to acquire a deep understanding of maths concepts, structures and procedures, step by step. Complex mathematical concepts are built on simpler components and when children understand every step in the learning sequence, maths becomes transparent and makes sense. Interactive lessons establish deep understanding in small steps, as well as fluency in key facts, such as times tables and number bonds. The whole class works on the same content and no child is left behind. The Power Maths approach fully supports these beliefs, and at the heart is a clearly structured teaching and learning process that ensures every child masters each maths concept securely and deeply. For each year group, the curriculum is broken down into core concepts, taught in units. A unit divides into smaller learning steps – lessons. Step by step, strong foundations of cumulative knowledge and understanding are built.

Lesson Structure

Each Power Maths lesson follows the same sequence and is designed to empower children to understand core concepts and grow in confidence.

- **Discover** – each lesson begins with a problem to solve, often a real-life example, sometimes a puzzle or a game. These are engaging and fun, and designed to get all children thinking and generate curiosity. Children may use manipulatives (practical apparatus) to help them understand the maths and explain their method.
- **Share** – the class shares their ideas and compares different ways to solve the problem, explaining their reasoning with hands-on resources and drawings to make their ideas clear. Children are able to develop their understanding of the concept with input from the teacher.
- **Think together** – the next part of the lesson is a journey through the concept, digging deeper and deeper so that each child builds on secure foundations, while being challenged to apply their understanding in different ways and with increasing independence.
- **Practice** – now children practise individually or in small groups, rehearsing and developing their skills to build fluency, understanding of the concept and confidence.
- **Reflect** – finally, children are prompted to reflect on and record their learning from each session and show how they have grasped the concept explored in the lesson.

Early Years Foundation Stage

We use the Early Years Foundation Stage (EYFS) Development Matters guidance to support children's mathematical learning and development. By the end of the Reception year children are expected to reach the Early Learning Goals (ELG) as outlined in the EYFS Statutory Framework (2017)

ELG 12 Numbers

- Children can 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 2 single-digit numbers and count on or back to find the answer.
- They solve problems, including doubling, halving and sharing.

ELG 13 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.

Children in EYFS explore mathematical concepts through active exploration and their everyday play-based learning. Children are taught key concepts and develop number sense using a multi-sensory approach, where children can physically learn and touch objects in their maths' play. EYFS practitioners provide opportunities for children to manipulate a variety of objects, which supports their understanding of quantity and number.

We use the Numberblocks materials, enabling children to explore the 'story' of numbers to twenty, and the development of models and images for numbers as a solid foundation for further progress. The CPA (concrete, pictorial, abstract) approach is used when teaching children key mathematical skills. Practitioners allow children time for exploration, and the use of concrete objects helps to support children's mathematical understanding. Mathematics in the early years provides children with a solid foundation that will enable them to develop skills as they progress through their schooling, and ensures children are ready for the National Curriculum.

Cross-curricular

Throughout the whole curriculum, opportunities to extend and promote Mathematics should be sought. Nevertheless, the prime focus should be on ensuring mathematical progress delivered discretely or otherwise.

Calculation Policies

Our calculation policies show the Power Maths progression in calculation (addition, subtraction, multiplication and division) and how this works in line with the National Curriculum. Each policy shows how the consistent use of the CPA (concrete, pictorial, abstract) approach helps children develop mastery in both written and mental methods across all the operations in an efficient and reliable way.

Fluency

In KS1, children complete and rehearse a daily set of number facts. This is based on the facts set out with the 'Progression in Teaching Addition Facts Addition'.

In KS2, children complete a daily set of arithmetic practice questions (Fluent in Five), designed to help develop and maintain fluency in both written and mental calculations. The structure of these sessions are also designed to help children distinguish between written and mental calculations. We recognise that regular practice of mental and written arithmetic skills is important in order to keep calculation skills fresh.

Resources

Every classroom has a set of essential concrete equipment to support daily learning. Resources that are not used or required regularly are stored centrally and accessed by teachers at the beginning of a topic.

Working Walls / Washing Lines

All classrooms have a Maths Working Wall / Washing Line which reflects the current Power Maths unit and is built up over time with the children. On display may be relevant key vocabulary, concrete, pictorial and abstract methods and STEM sentences.

Assessment

- Children in the Foundation Stage are assessed in accordance with the EYFS curriculum.
- Statutory Assessment takes place in the Summer Term in Years 2 and 6.
- The statutory Multiplication Tables Check takes place in the Summer Term in Year 4.
- In all year groups, Teacher Assessments will inform end of year predictions as to each child's attainment in Maths; these will be made in December, March and June, supported by formal testing every short term.

Marking and Presentation

Please refer to the Marking and Feedback Policy

Homework

In KS1, pupils may be expected to practise and learn the set of fluency facts they are focusing on in class. KS2 pupils are expected to complete times table practice at home to help develop their rapid recall of multiplication facts up to 12 x 12. To support this, children have access to the programme Times Tables Rockstars. In addition, pupils in Upper Key Stage 2 receive additional homework to reinforce learning in the classroom and help prepare them for transition to secondary school.

Monitoring and Evaluation

The Curriculum leader, alongside SLT, are responsible for monitoring and evaluating curriculum progress. This is done through book scrutiny, planning scrutiny, lesson observations, learning walks, pupil interviews, staff discussions, regular audit of resources and attendance of relevant teacher professional development.

Review

The mathematics policy will be reflected in our practice. The policy will be reviewed annually.

Agreement Date of Policy

This policy was developed by the Maths curriculum leader in September 2019.