

Maths Statement: Intent, Implementation and Impact Template: Part 1

Maths Intent (the What) and Implementation (the How):

How we ensure an ambitious Maths curriculum – a mastery curriculum:

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

1. 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.
2. **Reason** mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.
3. 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 an interconnected subject in which pupils need to be able to move fluently between different representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. Our maths curriculum is underpinned by the belief that all children need **a deep understanding of the mathematics they are learning**. This is what we mean by **Mastery**. There is one set of Mathematical concepts for all. We ensure all pupils have access to these concepts and the rich connections between them. Mastery is, therefore, the aim for all children, hence we have an **ambitious Maths curriculum for all**. We believe mastery is only going to be achieved when **more time is spent on key concepts** that are revisited and reviewed. This allows for the development of depth and sufficient practice to embed learning. Devoting time to key concepts enables us to:

- Represent concepts in lots of different ways (multiple representations).
- Teach the processes, then allow the children to apply their knowledge, increasingly rapidly and accurately. (Following a process / procedure won't enable mastery; applying a process will!)
- Commit key facts to children's long term memory.

To achieve this, we follow the **White Rose maths scheme**. We have chosen this as White Rose provides an ambitious, connected curriculum which is accessible to all pupils from YR to Y6 and embraces the aims of the National Curriculum. The scheme is well-structured and sequenced coherently which helps us to develop our children into mathematical thinkers. Within the curriculum, a wide range of mathematical resources are used and pupils are taught to show their workings/thinking in a concrete, pictorial and abstract form wherever suitable. This CPA approach is embedded; it helps children to understand the maths and make connections between different representations i.e the abstract mathematics. The scheme also puts great emphasis on mathematical language and questioning, to help secure and deepen children's understanding. They are taught to explain their choice of methods and develop their mathematical reasoning skills. We encourage resilience, adaptability and acceptance that struggle is often a necessary step in learning.

How we ensure challenge

We ensure that the vast majority of pupils, including those who are disadvantaged or have SEND will move through the curriculum at broadly the same pace. When teaching mathematics, we intend to provide a

curriculum which caters for the needs of all individuals and sets them up with the necessary skills and knowledge. Based on good AfL, our teachers make decisions about when to progress children, based on the security of pupils' understanding and their readiness to progress to the next stage. This does not mean that 'we hold children back' and that all children access the same questions and same activities all of the time. Pupils who grasp concepts rapidly are challenged by 'going deeper', being offered rich and more sophisticated problems before any acceleration through new content. Differentiation still takes place although it will often be through the same concept, posing different questions and problems for 'rapid graspers' to extend their thinking. Mastery strategies such as 'Prove it; Compare; True or False' are used. Those who are not sufficiently fluent with earlier material, consolidate their understanding, including through additional practice (e.g. pre and post teaching), before moving on. A ceiling is not put on children's learning and flexible grouping is adopted based on pre-assessments and AfL within each lesson.

How we ensure a well sequenced, progressive curriculum

Because we teach the 2014 National Curriculum, pupils gain understanding of the mathematics relevant to their year group so that it is built upon in subsequent years.

- To learn maths effectively, some things have to be learned before others. Our **high level long term map** for Maths outlines in year groups / phases when mathematical knowledge, in units of work, will be taught and revisited. This is the basis for our well sequenced and progressive curriculum. We ensure an emphasis on number skills and this content is carefully sequenced.
- Within each unit of work, content is also carefully selected into a series of small steps. These steps are deliberately sequenced. Each small step builds carefully from the previous step, building on children's prior knowledge to develop new knowledge and skills, building their mathematical understanding.
- Our Progression documents provide an overview of the development of concepts across the primary years. These allow subject leaders to have an overview of the progression of concepts over time and allow class teachers to know what children have learnt previously and how the learning continues subsequently.
- Our **Calculation policies** outline in more detail which concepts and procedures / strategies will be introduced and then developed and are based on the CPA approach.
- Our **weekly planning** is based on White Rose Maths which is tailored to the needs of our children. The progression of 'small steps' structure each unit of work being taught. We use many concrete resources throughout the school to ensure children are exposed to multiple representations of a concept. This is part of our CPA (Concrete, Pictorial and Abstract) approach.

Whilst we teach Maths in progressive distinct domains (units of work) we recognise that Maths is an interconnected subject. Therefore, we encourage children to make connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. Children also apply their mathematical knowledge across the curriculum, and particularly in Science, where relevant.

How we help children remember what they have been taught:

The curriculum sequence ensures pupils revisit and practise skills already learned. For example, when children have secure addition & subtraction knowledge, they will revisit these to calculate totals and change in money, calculating length and perimeter and within mass and capacity. These are also built upon in the next year group.

We also use Flashback 4 from White Rose at the start of each lesson. They help ensure essential knowledge is regularly revisited to strengthen retention. They are a series of quick questions to revisit something from the previous lesson, last week, last month and term.

In addition to the daily maths lesson, we have daily 'Maths meetings' to ensure daily review of key concepts. These retrieval sessions ensure mathematical declarative and procedural knowledge is secure in the long term memory. These daily sessions also focus on the recall of identified key facts (KIRFS). These progressive, specific facts are non-negotiables that every child should know by the end of each term in each year group.

We make time to teach Maths:

Children in EYFS have a daily mathematical focus.

Children in KS1 and 2 have a daily Maths session lasting for 50 mins / 1 hour.

If children are not reaching the expectations outlined below we intervene quickly by giving extra support. We give catch up support by 1:1 / group interventions / pre-teach, post teach. The content of these sessions is determined by on-going gap analyses and our in-depth knowledge of each child. These sessions are additional to our daily Maths sessions and are carefully planned to ensure children still access the broad and balanced curriculum.

We build a skilled team who can teach Maths:

We continuously strive to better ourselves and frequently share ideas and things that have been particularly effective. We take part in a range of training opportunities. The Trust provide support and training which has helped us build a team of skilled teachers. Some training has focused specifically on maths, for example subject knowledge, planning for maths in mixed-age classes. Our Maths Subject Leader has also accessed PDET CPD this academic year.

Most recent training has been on pedagogy – how to teach. This is transferrable across all subjects of the curriculum and has helped ensure we teach maths effectively. This training has focused on Rosenshine's Principles of Instruction.

Modelling is a central feature in our maths teaching where teachers model the steps that need to be taken to be successful, with explicit narration of the thought process when explaining how to complete a small step. Teachers narrate the decisions and choices they make such as where to begin. We then model again, scaffolding this for children step by step through the success criteria so that they can attempt the learning with support. Children then have an independent try and if any children are finding the learning difficult, extra modelling or extra support will be provided.

We have also carried out in house CPD sessions based on the aforementioned training and have carried out 1:1 coaching for identified staff. We also have a Maths specialist (MAST) who is a member of a Maths Hub.

Leaders in our academy prioritise the teaching of Maths. Maths is identified as a key priority on our Academy Improvement Plan. Leaders monitor the provision of Maths through, for example, learning walks in Maths sessions, monitoring books and the impact of this provision through the analysis of (i) end of year cohort data (end of KS1 and 2 Maths) and (ii) individual pupil attainment and progress throughout the year (on going assessments).

Early Years:

We value the importance of early experiences of maths and the 2021 Early Years Framework is the foundation for our teaching and learning. To ensure we teach the expectations for maths as set out in the framework and ensuring we provide our youngest children with a broad, ambitious maths curriculum, we have also implemented White Rose in Reception. This scheme places a significant emphasis on developing a strong grounding in number, enabling children to count confidently and identify relationships and patterns in numbers to ten.

From the beginning of EYFS (third week) we prioritise the **five principles of counting**:

- (i) The one-to-one principle: A child knows that we only count each item once.
- (ii) The stable order principle: A child knows that the order of the number names always stays the same. We always count by saying one, two, three, four, five....in that order.
- (iii) The cardinal principle: A child knows that the number they attach to the last object they count gives the answer to the question how many....?
- (iv) The abstraction principle: A child knows that we can count anything – they do not all need to be the same type of object.
- (v) The order irrelevance principle: A child knows that we count a group of objects in any order and in any arrangement and we will still get the same number.

We also prioritise:

- **Subitising**: the ability to recognise how many there are in a small group of objects without counting them. This allows children to see that numbers can be represented in different ways.
- **Unitising**: one object can have a value of more than one (equivalence). e.g. using Base 10 equipment, Numicon, coins.

White Rose is based on the characteristics of effective learning and teachers provide creative and engaging opportunities for children to ignite their curiosity and enthusiasm for maths. Children have a focused teaching input daily and this is supported in the continuous provision with a range of activities and experiences, to allow children to build on and apply their understanding, making progress through their play. Concrete manipulatives are a key part of the provision, as is the use of pictorial representation such as tens frames and part/whole model. Children are actively encouraged to use the correct mathematical vocabulary to aid their vocabulary development. The White Rose scheme supports the delivery of a maths curriculum that embeds mathematical thinking and talk.

Curriculum content is also built into a sequence of phases. Each phase builds on what has come before. Within each phase, there is a focus on number and on measure, shape & spatial thinking to ensure end of year expectations are met.

EYFS Impact

By the end of EYFS, we expect the vast majority of our children to achieve the ELGs in Number and Numerical Patterns:

Number ELG: Children at the expected level of development will:

Have a deep understanding of number to 10, including the composition of each number; Subitise (recognise quantities without counting) up to 5;

Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.

Numerical Patterns ELG: Children at the expected level of development will:

Verbally count beyond 20, recognising the pattern of the counting system;

Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity;

Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

KS1 (Implementation and Impact):

In KS1 our main priority is to ensure children are developing an appropriate, deep understanding and fluency of **place value and the four operations**.

We focus on:

- Using the CPA approach (Concrete, Pictorial and Abstract) as a way to introduce children to a range of representations. Each year group / class has a toolkit of concrete resources.
- Practice to aid fluency at this early stage.
- Partitioning in different ways.
- Early Addition and Subtraction strategies
- Early multiplication and division strategies (See detailed progression in our Calculation policies.)

In addition, we aim for children to:

- Develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary.
- Use a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.

We develop visualisation by:

- Using equipment
- Seeing equipment but not using it
- Visualising using a jotting.
- Introducing such methods as bar modelling to visualise mathematical concepts and solve problems.

We build in opportunities for verbalisation of thinking in younger years leading to written explanations of thinking / reasoning by Year 5/6. Children encouraged to answer in 'full sentence answers' by the use of sentence stems.

KS1 Impact

By the end of KS1 we expect the vast majority of our children to have developed confidence and mental fluency with whole numbers, counting and place value including working with numerals, words and the four operations with numbers up to 100.

Lower KS2 (Implementation and Impact)

In Lower KS2 our main priority is to ensure children **are becoming increasingly fluent with the four operations (including efficient methods), number facts and place value (including simple fractions and decimals) and are able to problem solve.**

We focus on:

- Continuing to use the CPA approach (Concrete, Pictorial and Abstract) as a way to develop children's conceptual understanding.
- Developing fluency for times table recall.
- Encouraging the most efficient strategies for calculation. Children are taught a range of strategies; they are taught to look at the calculation as a whole to encourage thinking about what the numbers mean rather than just the digits and using one strategy.
- Progressing understanding of multiplication by looking for linked / connected calculations.
- Progressing understanding of division.

In addition, we aim for children to:

- Draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them.
- Use measuring instruments with accuracy and make connections between measure and number.

LKS2 Impact

By the end of Year 4 we expect the vast majority of our children to have:

- Become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value.
- Developed efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.
- Developed their ability to solve a range of problems, including with simple fractions and decimal place value.
- Demonstrate quick recall of multiplication facts up to 12 x 12.

Upper Key Stage 2 (Implementation and Impact)

In Upper KS2 our main priority is to ensure that children are:

- Extending their understanding of the **number system and place value** to include larger integers.
- Developing connections between multiplication and division with **fractions, decimals, percentages and ratio.**
- Developing 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.

- Introduced to the language of **algebra** as a means for solving a variety of problems.

Calculators are introduced near the end of KS2 to support pupils' conceptual understanding and exploration of more complex number problems, if written and mental arithmetic are secure.

In addition, we aim for children to:

- to consolidate and extend their knowledge developed in number in geometry and measures.
- Classify shapes with increasingly complex geometric properties and learn the vocabulary they need to describe them.

UKS2 Impact

By the end of Year 6, we expect the vast majority of our children to:

- Be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages.
- Have deep conceptual understanding and the ability to recall and apply mathematical knowledge rapidly and accurately.
- Reason mathematically by following a line of enquiry, using their knowledge of relationships and generalisations, and justify using mathematical language
- Solve problems by applying their mathematics to a variety of problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.
- Demonstrate quick recall of facts and procedures.
- Have the confidence to move between different contexts and representations of maths.