



Maths Statement: Intent, Implementation and Impact at WPS

The aim at Woolton Primary School is to ensure children reach their full potential, leave the school being numerate and having a love for number, tackling maths with confidence as it is a skill for life.

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

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

Our maths teaching 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.

Mastery is a continuum. 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 will not enable mastery; applying a process will!).
- Commit key facts to children's long-term memory.

Therefore, at an age appropriate level, we expect the vast majority of our children to be able to:

- Use mathematical concepts, facts and procedures appropriately, flexibly and fluently
- Have a sufficient depth of knowledge and understanding to reason and explain mathematical concepts and procedures and use them to solve a variety of problems.
- Recall key number facts e.g. number bonds and times tables with speed and accuracy and use them to calculate and work out unknown facts.

How we ensure challenge

We ensure that the majority of pupils will move through the curriculum at broadly the same pace. However, 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; Always, Sometimes, Never are used. 'Deepening' through scaffolding is important in all year

groups but of paramount importance in our mixed age classes. Those who are not sufficiently fluent with earlier material, consolidate their understanding, including through additional practice, before moving on. A ceiling is not put on children's learning and flexible grouping is adopted based on pre-assessments.

How we ensure a well sequenced, progressive curriculum

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

- Our high-level long-term map for maths outlines in year groups when mathematical knowledge, in units of work, will be taught and revisited. This is the basis for our well sequenced and progressive curriculum.
- Our Progression documents provide an overview of the development of concepts across the primary years. NCETM progression documents are being used alongside White Rose. 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. (We are presently developing these detailed documents in other areas of the maths curriculum to supplement our maths planning.)
- Our weekly planning is based on NCETM Curriculum Prioritisation materials supplemented and supported by 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.

We regard talk in maths as important and introduce mathematical vocabulary in an age appropriate way. We encourage children to verbalise their thinking; our teachers ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.

We make time to teach Maths:

Children in EYFS have a daily mathematical focus and use continuous provision to embed key concepts in six main areas that underpin children's early mathematical learning, and which provide the firm foundations for the maths that children will encounter as they go up the years in primary school which are: Cardinality and Counting; Comparison; Composition; Pattern; Shape and Space; and Measures.

Children in KS1 and 2 have a daily maths session lasting for 1 hour or 5 hours over the week.

If children are not reaching the expectations outlined below we intervene quickly by giving extra support. We give catch up support by 1:1 adult support, small group interventions, as well as pre-teaching and post-teaching as necessary. 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.

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 rules of number.

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.
 - Early Addition and Subtraction strategies which include:
 - (i) Addition and Subtraction facts to 10
 - (ii) Recording when appropriate, using the word 'and' progressing to =.
 - (iii) Including putting the 'answer' at the front e.g. $10 = 4 + 6$ and including missing numbers $4 + _ = 10$
 - (iv) Exploring commutative $4 + 6 = 6 + 4$
 - (v) Exploring balanced sides e.g. $4 + 6 = 3 + 7$
- Progressing to:
- (vi) Subtraction and addition facts to 20
 - (vii) Recording of balanced sides e.g. $8 + 5 = 10 + 3$
 - (viii) Including missing numbers e.g. $8 + _ = 10 + 4$; $9 + _ = 10 + _$
 - (ix) Structured progression to addition of larger numbers:
 - e.g. How does making 10 help to solve
 - 2 digit and 1 digit (with a 1 in the tens column, bridging ten) e.g. $14 + 7 = 10 + 10 + 1$
 - 2 digit and 2 digit (with a 1 in both the ten columns) e.g. $14 + 17 = 20 + 10 + 1$
 - 2 digit and 2 digit e.g. $27 + 18 = 30 + 10 + 5$

- Partitioning in different ways
- Early multiplication and division strategies which include:
 - (i) Repeated addition
 - (ii) Counting in multiples
 - (iii) Arrays
 - (iv) Progressing from division as sharing to grouping. (Division as sharing becomes an inefficient strategy as soon as numbers become larger. Division as grouping also enables the connection to be made between \times and \div).

(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 which are on display in classrooms.

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.

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.
- 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 by e.g.:
 - (i) By halving to make the calculation easier
 - (ii) By dividing the dividend and the divisor by any number to make the calculation easier

Divide by partitioning in different ways (See detailed progression in our Calculation policies.) In

(iii) 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.
- Memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work.

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:

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

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- 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.