



Mathematics Overview

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Statement of Intent

Our intent in maths is for all pupils to become confident, competent and resilient mathematicians who relish the challenge of maths, and have a sense of enjoyment and curiosity about the subject. We aim to design a curriculum that is accessible for all, will maximise the development of every child's ability and provide the opportunity for all children to fulfil their potential in maths. It is our aim to prepare children to recognise structures within maths helping to develop their fluency and knowledge of 'how the maths works.'

We aim to promote a love of maths in all children by ensuring that all pupils:

- become fluent in the fundamentals of maths through varied and frequent practice so pupils develop conceptual understanding and the ability to recall knowledge rapidly and accurately
- develop an understanding of their own metacognition through a focus on providing opportunities for them to plan what they are going to do when faced with a maths problem, monitor how well they are doing as they try to solve and evaluate how well they did once they have solved it or not
- use their understanding to reason mathematically including explaining, justifying or providing evidence using mathematical language
- make the relevant links to how maths can be applied in everyday life.

Maths is taught across the school in daily maths lessons and through cross-curricular links within our topics. We use the National Curriculum aims to ensure all pupils become fluent in the fundamentals of mathematics, reason mathematically and can solve problems by applying their mathematics to a variety of problems. When solving problems, we want our children to:

- make links to the fluency as this is highly connected and is how children develop their conceptual and procedural fluency
- use and compare different approaching and strategies
- interrogate and use their existing knowledge

At Woodfield Primary, we believe it is very important for every child to establish a secure foundation in mental calculation and to be able recall number facts. To promote the importance of this, all children participate in regular retrieval through activities designed

to help children by revisiting previous learning and embedding their understanding. In the teaching of maths in our school, we seek to consider not only the importance of understanding the content being delivered but also the ways in which we teach it, the common misconceptions and the most appropriate models. In our teaching of the subject, we consider a 'learning journey' that can focus on one objective over one lesson or a series of lessons. The learning journey enables all children to make progress using concrete, visual and abstract approaches including application and reasoning opportunities for all children at the level at which they are working. Through this journey, we not only value the importance of understanding the content being delivered but also the ways in which to teach it, the common misconceptions and the most appropriate models.

We endeavour to ensure that our maths curriculum provides children with an opportunity to see the value of the subject and its role in everyday life, and give them the confidence and motivation to further develop their skills into the next stage of their education, life experiences and career selections.

Implementation within the subject

At Woodfield Primary, we organise our curriculum in a way that ensures progression. We suggest a programme that teachers follow to help to ensure that all objectives are covered allowing children to build upon what they already know, and to revisit certain parts of the curriculum across the academic year so that it helps our children to store this knowledge and understanding in their long-term memory. As many mathematical objectives are revisited and developed in most year groups, teachers consider the learning that has already taken place and how what they are learning now can help children as they move forward in their primary and secondary maths learning. In maths sessions, children are made aware of what they are learning and why enabling them to become aware of the journey that they are on in the subject and how what they are currently doing fits in with their development in maths.

During our maths learning, children will:

- be able to use a variety of approaches to their learning including concrete, visual and abstract as shown in our calculation policy
- be supported through live marking allowing immediate feedback from an adult in order to support, consolidate or extend the learning of the child
- be supported through modelling and scaffolding at various times within the lesson
- be encouraged to 'have a go' as early as possible within the lesson in order to maximise the potential for progress
- be taught by teachers with secure subject knowledge who consider potential misconceptions and how these can be addressed
- have discussions and dialogue with the adults in the classroom so that they understand key concepts

Opportunities are provided across the week for children to recall the previous learning by completing a low stakes assessment in the form of a weekly quiz. The quiz is designed to check whether

children can recall something that they have learned last week, last term and finally a conundrum to challenge the thinking of the child. Furthermore, children complete a weekly arithmetic activity to help them to use mathematical strategies and methods regularly. At Woodfield, we understand the importance of being able to calculate mentally where possible, or using an efficient written method with confidence and provide opportunities for these to be given the importance within the learning of the children.

Impact in maths

Children at Woodfield Primary will develop their long-term memory of the mathematical concepts by regularly recalling their previous learning and applying this in a variety of ways. More children will use their fluency skills in problem solving and reasoning when working against mathematical concepts allowing them to deepen and broaden their understanding. By being provided with more complex tasks and using higher-level skills, children will show a deeper level of understanding within the subject. More children will have the opportunity to work at a greater depth level within the subject, which will impact upon end of year assessment and end of key stage outcomes. They will confidently express what they have learnt in maths identifying how their current learning builds upon what they have previously studied.

All teachers will be able to articulate how their own provision in the subject links to the 'bigger picture' explaining why they are learning what they are at this current time, and how this links to prior and future learning. Teachers will have an increased understanding of how they can challenge all children especially the more gifted children in the subject. Teachers will have a better awareness of the level that children are working at in maths and identify where the children will move to next to continue the development of their learning within the subject.

Planning Progression Document (see separate resource)

Our planning document is designed to support when structuring objectives across the year. It identifies how topics should be revisited each term in all year groups and how it is essential that key concepts are revisited regularly to embed in long-term memory. Within this, key concepts have been identified by subject leaders across the MAT and are highlighted in bold; these are essential building blocks for the next steps in learning. These objectives must be embedded across the year so that children are fluent.

We always consider the opportunities for reasoning, problem solving and fluency that we are presenting to our children. These can be taught in any order and are not hierarchical. Some of our children can often reason mathematically before they are able to solve the same problem using calculations or can answer the question easily but struggle to break down the problem.

Number fluency is key to our children having a secure understanding of mathematics so opportunities are built into our school day to recap on number bonds, times tables and fluency with operations in addition to your daily maths lessons.

Our teaching is based on our assessment of the prior knowledge of the children in our class and will build on that from lesson to lesson. Planning is adapted in response to the feedback from the children and will be different from year to year and class to class.

Year 1 example:

Year 1

Autumn	Spring	Summer
Number and Place Value	Number and Place Value	Number and Place Value
Addition and Subtraction	Addition and Subtraction	Addition and Subtraction
Fractions	Multiplication and Division	Multiplication and Division
Measures <ul style="list-style-type: none"> ○ Time ○ Length/Capacity ○ Money 	Measures <ul style="list-style-type: none"> ○ Time ○ Length/Capacity ○ Mass/Weight 	Measurement <ul style="list-style-type: none"> ○ Time ○ Length/Capacity ○ Mass/Weight
Geometry – properties of shapes	2d and 3d Shapes	2d and 3d Shapes
	Fractions	Fractions
		Position and direction

Year 1 Objectives


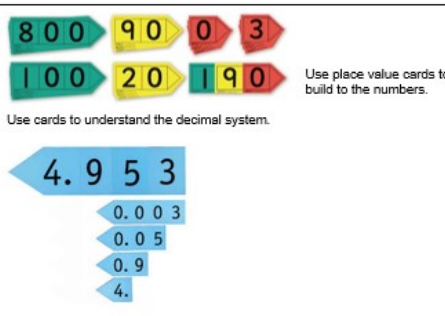
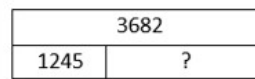
Number – number and place value
<ul style="list-style-type: none"> ▪ count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number ▪ count, read and write numbers to 100 in numerals; ▪ count in multiples of twos, fives and tens ▪ given a number, identify one more and one less (under 100) ▪ identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least ▪ read and write numbers from 1 to 20 in numerals and words.
Number – addition and subtraction
<ul style="list-style-type: none"> ▪ read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs ▪ represent and use number bonds and related subtraction facts within 20 ▪ add and subtract one-digit and two-digit numbers to 20, including zero ▪ <u>solve</u> one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = \square - 9$.
Number – multiplication and division
<ul style="list-style-type: none"> ▪ <u>solve</u> one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.
Number Fractions
<ul style="list-style-type: none"> ▪ recognise, find and name a half as one of two equal parts of an object, shape or quantity ▪ recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.
Measurement

Progression in Calculations (see separate resource)

Our calculation guidelines focus on a variation of methods that might be used across KS1 and KS2 in the four operations. The document is designed to show how some of our children, regardless of age, may still need to access concrete or pictorial resources in order to work towards the learning objective identified in the ARE for their year group.

The policy identifies how our children can work against the same learning objective at a variety of levels. Progression is evident through the suggested methods that our children can use dependent upon their level of competence for example, concrete resources, pictorial resources before moving to the abstract.

Year 4 example:

Year 4			
Layers of vocabulary  Beck's Tiers of Vocabulary	Basic to subject specific (Beck's Tiers): subtract, subtraction, take (away), minus, decrease, leave, how many are left/left over? difference between, half, halve, how many more/fewer is... than...? how much more/less is...? equals, sign, is the same as, tens boundary, hundreds boundary, inverse, exchange, carried digits Instructional vocabulary: calculate, work out, solve, investigate, question, answer, check		
Objective and Strategies	Concrete	Pictorial	Abstract This will lead to an understanding of subtracting any number including decimals.
Column method without exchange. Column method with exchange. 4 digit subtract 4 digit. Apply method in the context of measures, including decimals. Continue the concept of zero as a place holder, e.g. 5026 has 6 units/ones and 50 hundreds which is the same as five thousand.	 <p>Use place value cards to build to the numbers.</p> <p>Use cards to understand the decimal system.</p> <p>Use place counters for those who have not yet understand the exchange concept.</p>	Bar modelling. 	Compact method: $\begin{array}{r} 6467 - 2684 \\ 5131 \\ \underline{8467} \\ 3783 \end{array}$ $\begin{array}{r} 3249 - 725 \\ 1181 \\ \underline{3249} \\ 31765 \end{array}$ <p>Look at the accurate exchanging with more than one zero:</p> $\begin{array}{r} 6003 \\ - 2786 \\ \hline \end{array}$

Aims and Expectations

Maths is taught across our school in daily maths lessons and through cross-curricular links within our topics. The 2014 National Curriculum aims to ensure all pupils become fluent in the fundamentals of mathematics, reason mathematically and can solve problems by applying their mathematics to a variety of problems.

At Woodfield Primary, we aim to use a variety of teaching and learning styles in mathematics lessons. Our principal aim is to develop children's knowledge, skills and understanding in mathematics. We do this through a daily lesson that has a proportion of whole-class and group-direct teaching. During these lessons, we encourage children to ask as well as answer mathematical questions. The children have the opportunity to use a wide range of manipulatives and resources across the year groups so that children can have concrete experiences that enable them to create visual images. Our children are encouraged to articulate their learning, to become pattern spotters and be resilient when problem solving. We recognise that maths should be taught in a practical and meaningful way.

We try to provide opportunities for children to develop into confident mathematicians who are able to use mathematics as a tool in a wide range of activities both in and out of school.

Our expectations at Woodfield Primary:

- all teachers demonstrate high expectations of all children
- most children should be working towards ARE for their year groups
- we provide challenge for all through a range of application and reasoning opportunities that are suited to the ability of the child

Planning and Resourcing

Learning Objectives

At Woodfield Primary, we use learning objectives as a tool to share with the children exactly what they are working upon in each maths session.

Learning objectives are identified in the National Curriculum or in the ARE assessment criteria for each year group.

Objectives should be specific (identifying exactly what the children are working towards) and measurable (something that can be achieved within one lesson or across a series of lessons).

Learning objectives should be recorded for an individual session or at the beginning of a series of lessons where the children develop their knowledge and understanding of the same concept.

Learning objectives will be shared and discussed with the children at the beginning of each session, so that they are aware of what they are learning and be able to explain/articulate this.

Success Criteria

At Woodfield Primary, we use success criteria to help to identify the skills and understanding that children must have or demonstrate within a lesson or across a series of lessons in order to achieve the learning objective.

The success criteria is required when a new mathematical concept or skill is being introduced either within a single session or across a series of lessons.

Success criteria can be differentiated if appropriate to suit the needs of a specific child or group.

Like learning objectives, success criteria will be explained and discussed with children so they become aware of what they need to do in order to achieve the learning objective.

Tasks – fluency, application and reasoning

We aim to provide children with tasks that are challenging, motivating and encourage the pupils to think about how they learn or discuss what they have been learning. To enable these opportunities, children work in many different ways across their maths lessons including independent work, paired work, group work, whole class teaching and 1:1 or small group support.

Tasks are designed to suit the needs of the children and enable an opportunity to achieve the learning objective, whilst also allowing each child to progress at their own pace throughout the lesson. Teachers are encouraged to provide opportunities for children to complete questions that allow them to evidence their fluency, application and reasoning skills. These types of questions will allow some children to practice the skill or method developing their understanding of what is being taught whilst allowing others to progress onto applying their knowledge in a variety of ways to show how well they understand the concept being covered. Every task is designed to follow this process and children move along at their own pace dependent upon their achievements within the lesson. This approach allows the opportunity for all children to progress within a lesson or across a series of lessons. Teachers use AfL to assess the starting point within a task for a specific child or group of children and to move the children on through the task appropriately.

Feedback/live marking

At Woodfield Primary, we encourage the use of live marking within maths sessions as this offers immediate feedback for both the teacher and learner.

This type of marking and feedback allows teachers to consolidate the learning of a child within the lesson through the use of

questioning, modelling, scaffolding and prompts. It also allows teachers to assess the depth of a child's understanding and provides the opportunity to move their learning on.

Teachers also provide feedback to children at the end of the lesson where appropriate. This can be used a resource to consolidate the learning by identifying and rectifying mistakes or checking the understanding of a child, or to extend and challenge their understanding further.

Mental arithmetic

At Woodfield primary, we recognise the importance of a child being able to identify when it is more efficient for a calculation to be completed mentally rather than the use of a written method. It is very important that children should feel confident selecting an appropriate method when solving a question or problem.

We believe it is important for every child to establish a secure foundation in mental calculation and recall of number facts before standard written methods are introduced.

To help develop the children's confidence identifying when a mental strategy is more appropriate and to build up a bank of strategies that can be used with speed and accuracy, teachers provide weekly opportunities for a mental arithmetic activity. This is included in one of the five daily lessons where children complete a short activity and the work is discussed with the teacher.

Within this activity, teachers are encouraged to consider the skills and objectives that are identified in the ARE that could be used and practiced within this time. The focus could be upon one skill or a number of skills.

Quizzing

We recognise that our children can sometimes struggle to recall their previous learning from term to term, and from year to year. We therefore provide opportunities for our children to practice this by offering a weekly quiz within maths sessions to enable the children to recall their previous learning.

Once a week, teachers plan a weekly quiz into one of their daily maths sessions. During this, children are given sufficient time to answer the questions provided which are discussed accordingly with the class teacher.

Our quizzes are designed using a 'Last week, Last term, Conundrum' format to allow children to recall their short and long term memory, and then to deepen their level of thinking further. All of the questions within the quizzes should be pitched at ARE unless a child is working significantly below their year group. Teachers can use the feedback gained from the quizzes to inform their planning based upon the success of the children in these activities.

Online resources

As a school we recognise the importance of offering online learning opportunities for our children to help with their learning as this is how some will learn best.

Across the whole school, children are provided with access to TTRS which can be used both in and out of school to develop the rapid recall of multiplication and division facts with speed and accuracy.

In year 6, children are provided with a unique username and password to access Mathletics. This resource provides opportunities for children to practice the skills they have learned across KS2. Tasks can be set by the class teacher linked to the learning taking place within maths lessons and children also have an opportunity to play against each other and other from around the world in Live Mathletics.

Assessment and Recording

Children's work is assessed and recorded in mathematics in a range of ways including formative and summative assessments. The age related expectations for each year group as identified in the National Curriculum 2014, are used to identify whether each child has achieved each objective across the academic year. Evidence to support this can be work in the daily lessons, formative discussions, intervention and support groups, and end of term assessments.

Formative assessment

Teachers integrate the use of formative assessment strategies such as effective questioning, clear learning objectives, the use of success criteria and effective feedback and response in their teaching.

Summative Assessment

Using termly assessments and the work completed in daily lessons, pupils are assessed against the age related expectations for their year group.

Each pupil is identified as working below the standard (BLW), working towards the standard (WTS), work at the expected standard (EXS) and working above the standard/greater depth (GDS).

This assessment is recorded and updated termly on the school's tracking system showing progress for individual children, groups,

classes and year groups.

This is also recorded on our Assessment Criteria document used for a specific group of children in each class. This group will include children deemed GD, EXS, WTS and any children with SEND requirements.

An example of this document can be seen below:

Number, place value, approximation and rounding

Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
1N1a Count to and across 100, forward and backwards, beginning with 0 or 1, or from any given number	2N1 Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward	3N1 Count from 0 in multiples of 4, 8, 50 and 100.	4N1 Count in multiples of 6, 9, 25 and 1000	5N1 Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000	
1N1b Count in multiples of twos, fives and tens					
1N2a Count, read and write numbers to 100 in numerals	2N2a Read and write numbers to at least 100 in numerals and in words	3N2a Compare and order numbers up to 1000 Read and write numbers to 1000 in numerals and words	4N2 Order and compare numbers beyond 1000	5N2 Read, write, order and compare numbers to at least 1 000 000	6N2 Read, write, order and compare numbers to at least 10 000 000
1N2b Given a number, identify one more and one less	2N2b Compare and order numbers from 0 up to 100; use <, > and = signs	3N2b Find 10 or 100 more or less than a given number	4N2b Find 1000 more or less than a given number		
1N2c Read and write numbers from 1 to 20 in numerals and words					
	2N3 Recognise the place value of each digit in a two-digit number (tens, ones)	3N3 Recognise the place value of each digit in a three-digit number (hundreds, tens, ones)	4N3a Recognise the place value of each digit in a four digit number (thousands, hundreds, tens and ones)	5N3a Determine the place value of each digit in numbers up to 1 000 000	6N3 Determine the place value of each digit in numbers up to 10 000 000

National Curriculum tests are used at the end of KS1 and 2; teachers use past and sample papers to inform their assessments as they prepare pupils for these assessments.