

Hurworth Primary School

Mathematics Strategy

Maths at Hurworth

Our main aim is for all children to develop a positive 'can do' attitude towards mathematics and experience success and enjoyment in this subject. We believe all children are capable of succeeding irrespective of their needs, abilities or backgrounds. Our intent is for all children to be secure in key age related content and reach the expected standards in EYFS, Key Stages 1 and 2, and exceed them where they can.

We believe it is important for all children to develop a deep understanding, confidence and competence within mathematics as well as the ability to apply their knowledge across other areas of the National Curriculum. Our intent is for all children to be fluent mathematicians, be able to talk confidently and reason about mathematics and follow their own curiosity to make connections, explore patterns and ask questions.

We want our children to relish the challenge that maths offers. Our intent is for children to become resilient learners and learn without being worried about getting things wrong. We want our children to be 'brave mathematicians' and explore the many ways a problem can be solved.

Maths Teaching

We follow a mastery approach to teaching mathematics. Our long term plans are based on the White Rose scheme of learning. Our plans are carefully designed to ensure children become fluent in their learning before moving on; topics are taught in blocks to encourage deeper understanding and each unit builds progressively through teaching in small steps so that knowledge and skills can be embedded, reviewed and revisited.

- Our children are taught maths daily through whole-class interactive teaching, where the focus is on all children working together on the same lesson content at the same time. This ensures that all children have the opportunity to master concepts before moving on to the next learning step.
- We feel all children having the same starting point in lessons helps to build confidence and avoids children feeling like they cannot do 'the harder work'. There is a natural progression through activities and questions set; we always start with fluency, moving onto varied fluency and then giving the children chance to apply their knowledge to reasoning and problem solving style questions.
- We believe children learn a lot through talking and discussing their learning and we therefore have an expectation that children work in mixed ability groups to enable effective discussions. Sometimes teachers may work with focus groups of children to scaffold or develop learning further.
- If a child does not grasp a concept within a lesson, this is identified quickly and support is put in place to enable them to move forward with the whole class in the next lesson. This support may be in the form of pre-teaching prior to the next lesson or through additional catch up sessions to ensure key knowledge and concepts are secured.
- We feel it is important to 'over-teach' key concept, in the core areas of: number and place value, the four operations, times tables and division facts.

- From Year 1, at the start of each lesson, we always start with a 'Flashback 4' activity – this is a series of four questions which aim to revisit prior knowledge from the previous lesson, previous unit and previous year group. This helps us to make sure that important facts, knowledge and key concepts are being remembered and it also provides a firm foundation for each unit and lesson.
- Teachers are expected to use a variety of resources to plan their daily lessons to ensure learning is tailored to individual classes and pupils, ensuring that each child's needs are catered for.
- Across all year groups, we recognise the importance of the CPA approach to mathematical learning (concrete – pictorial – abstract). Children start by being able to understand and relate to the questions using a 'concrete' method (using manipulatives such as numicon, base 10 or cubes). As their understanding progresses, the context is then represented in a 'pictorial' state (actual pictures of objects at first, and then later moving onto more abstract representations such as bar models). The final stage, 'abstract' refers to more formal methods of calculations (written methods such as column method or the bus stop method). We understand that children learn in different ways and the use of varied representations and structures helps to develop a deeper understanding and to strengthen a 'sense' of number.
- Challenge is very important to us and we make sure to embed challenge within every lesson for all children. Children are challenged in a variety of ways including through targeted questioning, and deepening challenges. Children will always work within the lesson content and will never go beyond year group expectations. Instead, we aim to deepen knowledge by asking children to apply their knowledge in different ways. We believe it is more important for children to be able to tackle problems and find several solutions rather than completing the same style of question several times.

Mathematics Planning

- White Rose Yearly overview and our long term planning. Separate documents for each year group will be added to our website soon.
- Early Years trust ready maths curriculum for Reception and Lingfield Trust's 25 key objectives for Years 1-6
- Weekly planning including; Flashback 4, key vocabulary, key questions and challenge
- Weekly arithmetic tests in Year 6 to practise taught concepts, identify misconceptions and address gaps in learning

Multiplication Tables Teaching and Expectations

We understand that the quick recall of multiplication and division facts is an essential skill for our children. We want our children to be able to confidently recall facts up to 12 x 12 by the end of Year 4 and then have the ability to apply their knowledge in Year 5 and 6 and beyond. We know that the ability to instantly recall these facts enables children to answer relative questions with ease. Therefore, we feel it is important to approach the teaching and testing of times tables in a consistent and progressive format from Reception through to Year 6. We have therefore carefully designed our yearly overview to ensure children learn times table knowledge progressively and opportunities are planned to review and check knowledge.

End of year expectations:

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|-----------|---|
| Reception | There is no specific statement for Reception, however we feel it is important that children are exposed to counting in twos, fives and tens in readiness for Year 1. |
| Year 1 | <ul style="list-style-type: none"> Count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens |
| Year 2 | <ul style="list-style-type: none"> Count in steps of 2, 3, and 5 from 0, and in tens from any number, forwards and backwards Recall and use multiplication facts and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers |
| Year 3 | <ul style="list-style-type: none"> Count from 0 in multiples of 3, 4, 8, 50 and 100 Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables |
| Year 4 | <ul style="list-style-type: none"> Count in multiples of 6, 7, 9, 25 and 1000 Recall multiplication and division facts for multiplication tables up to 12x12 |
| Year 5 | ➤ Multiply and divide numbers mentally drawing upon known facts |
| Year 6 | ➤ Perform mental calculations, including with mixed operations and large numbers |

Our Yearly Structure:



Times Tables Yearly Overview



| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|-----------|---|--|----------------------------------|---|---|--|
| Reception | In Reception, children will explore counting in twos, fives and tens through songs, nursery rhymes and books. | | | | | |
| Year 1 | | | | Counting in twos (skip counting, repeated addition and lots of) | Counting in tens (skip counting, repeated addition and lots of) | Counting in fives (skip counting, repeated addition and lots of) |
| Year 2 | | 2 x (3 weeks) 2 ÷ (3 weeks) | 10 x (3 weeks) 10 ÷ (3 weeks) | 5 x (3 weeks) 5 ÷ (3 weeks) | Counting in threes (skip counting, repeated addition and lots of) | Consolidate 2x, 10x, 5x (including division facts) |
| Year 3 | Mixed 2, 10 and 5 assessment 3 x (3 weeks) 3 ÷ (3 weeks) | 4 x (3 weeks) 4 ÷ (3 weeks) | 8 x (3 weeks) 8 ÷ (3 weeks) | 6 x (3 weeks) 6 ÷ (3 weeks) | 7 x (3 weeks) 7 ÷ (3 weeks) | Consolidate 3x, 4x, 8x (including division facts) |
| Year 4 | Mixed 3, 4 and 8 assessment Consolidate 6x and 7x (including division facts) | 9 x (3 weeks) 9 ÷ (3 weeks) | 11 x (3 weeks) 11 ÷ (3 weeks) | 12 x (3 weeks) 12 ÷ (3 weeks) | Consolidate all times tables up to 12 x 12 (including division facts) | |
| Year 5 | Mixed times tables up to 12x12 assessment | Keep up sessions for children who need it. | | | | |
| Year 6 | Mixed times tables up to 12x12 assessment | Keep up sessions for children who need it. | | | | |

In Years 1-4, children will be taught specific strategies and methods to help them learn their multiplication and division facts where the main focus is on children linking their knowledge and using facts they already know to work out facts they do not know.

Two 10 minute sessions a week are taught focussing on such facts and following the teaching, the children are then given a test weekly to check their understanding and automaticity of the learnt facts. The test contains 10 questions for Year 1 and 25 questions for Years 2-4.

Our structure for times tables focusses on all children being taught the same content at the same time. However, we do ensure that children are being challenged from week to week.

In Year 1, children start off learning to count in multiples and then will be challenged with counting backwards, repeated addition, 'lots of' sentences and then tackling multiplication facts if they are ready.

In Years 2-6, when learning multiplication facts children start with learning multiplication facts, moving onto commutative facts and then applying their knowledge to missing numbers. When learning division facts, children start with learning division facts, moving onto mixed multiplication and division and then applying their knowledge to missing numbers.

All children also receive a weekly homework sheet to help them practise the facts that they are learning in class and they also have access to Maths Shed (in Year 2) and Times Table Rock Stars (in Years 3-6). We also encourage our children to practise using White Rose's 1-Minute Maths App.

If children do not pass after 3 weeks, they will then receive keep up sessions to enable them to continue learning the relevant facts whilst also addressing any gaps in knowledge.

Number Facts

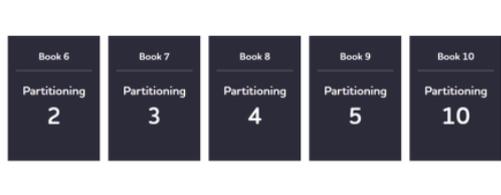
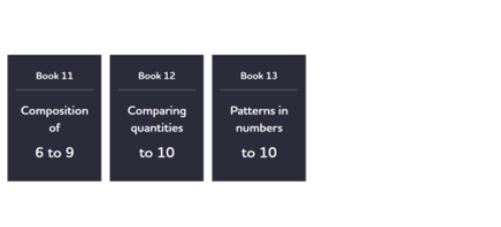
We feel that making sense of number and being fluent in number facts from an early stage is hugely important in providing a solid base for future mathematical learning. We therefore follow the Number Sense program which aims to stop children being reliant on counting on their fingers to calculate and enable children to develop both a deep understanding of number and number relationships, and fluency in addition and subtraction facts.

In Reception, children are exposed to Number Sense content embedded in daily maths lessons. In Year 1, Year 2 and Year 3, at least three sessions are taught weekly in addition to daily maths lessons. All sessions are no longer than 15 minutes and have a strong focus on talk and verbal reasoning.

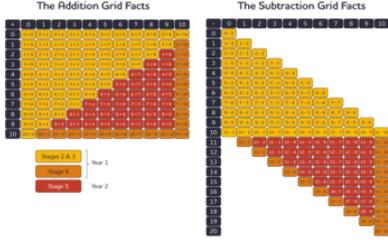
By the end of the Number Sense program, all children should understand how to use the key strategies to recall addition and subtraction facts fluently and have the ability to apply these strategies when solving more complex calculations and problems. The strategies covered are:

- One More, One Less
- Two More, Two Less: Think Odds and Evens
- Number 10 Fact Families
- Five and A Bit
- Know About 0
- Doubles and Near Doubles
- Number Neighbours: Spot the Difference
- 7 Tree 9 Square
- Ten and A Bit
- Make 10 and Then

Reception Number Sense Overview

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|---|--|
|  | <p>Books 1 – 5 focus on subitising. The word subitising comes from the root word 'subitus' meaning suddenly, and is the ability to quickly recognise how many items are in sets of up to 4 or 5 without counting. We are born with the ability to subitise, so starting with a focus on subitising is something that is accessible to all children, regardless of prior experience.</p> <p>The programme books sequentially introduce quantities to five, and provide guidance on how to support children to subitise these quantities. As we can only subitise up to 4 or 5 randomly arranged items, quantities above this amount need to be organised into a recognisable structure for us to subitise them, for example the six dice pattern. For this reason, Book 4 and 5 introduce and develop the use of structured mathematical models and arrangements, such as the five frame and ten frame.</p> |
|  | <p>These books continue to develop children's subitising skills, but rather than focusing just on the whole quantities in the way books 1 – 5 do, they start to focus on splitting up quantities into parts.</p> <p>The Early Learning Goal states that children should automatically recall number bonds up to five and some number bonds to 10. These books support children to do just that. The provide lots of contexts and prompts for partitioning sets, and building strong visual models of each quantity which support children to know the bonds within each number.</p> |
|  | <p>Books on partitioning 6 – 9 are not provided in the previous section as children are not expected to know number bonds for these. However Book 11 supports children to understand more about the composition of these numbers, and to develop a deep understanding of them.</p> <p>By the time children get to Book 12, they will already have a deep understanding of numbers to 10, and have had lots of discussions which involve comparing them. This book pulls together that learning to provide focused resources on comparison.</p> <p>Book 13, patterns in numbers to 10, supports children to learn more about the structure of odd and even numbers, and of doubles, including supporting the recall of some doubles facts as required by the Early Learning Goal</p> |

Number Facts Fluency Program Overview for Years 1 to 3

| Stage | Year | Focus of stage | Mapping to the grid facts |
|---|-----------------------|---|---|
| Stage 1 Visual Number Foundations | Year 1 | <ul style="list-style-type: none"> Building a deep and visual understanding of numbers 1-10 Subitising quantities 1 – 5, and subitising structured arrangements for quantities 6-10 Recognising quantities 1-10 twos-wise and fives-wise on tens frames <p>ASSESSMENT CHECK POINT – NUMBERS 1-10</p> | Preparation for meeting the grid facts |
| Stage 2 Make and Break Numbers to 10 | | <ul style="list-style-type: none"> Exploring the different ways that every number to 10 can be broken into parts and put back together Starting to remember some facts Introducing addition and subtraction equations | |
| Stage 3 Facts and Strategies within 10 | | <ul style="list-style-type: none"> Learning calculation strategies for adding and subtracting within 10 Learning to use what you know to work out what you don't yet know Achieving fluency in addition and subtraction facts within 10 <p>ASSESSMENT CHECK POINT – FACTS WITHIN 10</p> | |
| Stage 4 Ten and A Bit | Year 2 | <ul style="list-style-type: none"> Building a deep and visual understanding of the numbers and quantities 11 to 20 Understanding the concept of place value Learning the Ten and A Bit calculation strategy <p>ASSESSMENT CHECK POINT – TEN AND A BIT FACTS</p> | <p>Achieving fluency in the grid facts</p>  |
| Stage 5 Facts and Strategies across 10 | | <ul style="list-style-type: none"> Learning the remaining calculation strategies Practicing strategy selection to promote efficient and flexible thinking Achieving fluency in addition and subtraction facts across 10 <p>ASSESSMENT CHECK POINT – FACTS ACROSS 10</p> | |
| Stage 6 Extending Facts and Strategies | | <ul style="list-style-type: none"> Learning to extend and apply the within and across 10 facts to addition and subtraction calculations involving 2-digit numbers | |
| Consolidation | Year 3 Autumn Term | <ul style="list-style-type: none"> Reviewing and consolidating Stage 5 and 6 to secure fluency in facts across 10 and in mental 2 digit calculation | Extending the grid facts to other calculations |

Progression in Mathematics

We have designed a progression document to ensure that mathematics is progressive across our curriculum, from Early Learning Goals in Reception to Year 6 National Curriculum expectations.

From Year 1 to 6, individual strands of the National Curriculum are mapped across the year groups. This clearly shows prior learning and future learning beyond the current year group within different strands of mathematics.

For Reception, you will see Early Learning Goals and statements taken from our Trust Ready document linked to the strands in the National Curriculum for KS1 and KS2.

You will find the full document (Mathematics Progression) on our website.

Early Mathematics

We aim to develop a positive 'can do' attitude towards mathematics from the very start. In Reception, we aim to nurture positive attitudes towards maths and help children to build confidence.

We aim to deliver a curriculum that embeds mathematical thinking and talk and allows key mathematical concepts to be revisited and developed further across the year. We always build upon what children already know and can do and as young children learn best when they are interested, we aim to teach maths through stories, songs, rhymes and engaging practical activities where possible. We feel it is important for children to be using the correct mathematical vocabulary right from the start of their mathematics journey and therefore teachers will ensure vocabulary forms a key part of discussions within daily lessons.

We want our children to achieve a mastery level, in relation to recognising and understanding numbers, quantity and patterns. Further, we want them to develop a really strong sense of number. This is important to ensure children have the confidence and strong understanding of basic numbers in preparation for Key Stage One.

Children with SEND

Our mastery approach to mathematics is designed to give all learners, particularly the most disadvantaged and those with special educational needs and/or disabilities (SEND), the knowledge they need to succeed in life. We believe that everyone, no matter what their starting point is, can learn and improve at maths. We consider each child as an individual and we aim to provide the appropriate support and resources to ensure that every child has the opportunity to make progress and reach their full potential. If a child is working below their current year group, they will receive additional support to address gaps in learning whilst also have exposure to their current year group's content.

Mathematics Across the Curriculum

Children will be given the opportunity to use and apply mathematical skills in other areas of the curriculum across all year groups. This will enable them to see how maths is used in the real world. Teachers are expected to carefully identify where mathematical learning can be practised in other curriculum areas for example, data handling in science.

Vocabulary Expectations

Vocabulary is at the heart of our mathematics curriculum. We believe that the understanding and use of mathematical vocabulary is the key to success. The vocabulary that children are expected to understand and use is progressive throughout year groups. New vocabulary is detailed on our year group long term plans and teachers also include it on their daily planning.

Homework Expectations

The main focus of our maths homework from Year 1 to Year 4 is for children to practise their arithmetic skills. Maths homework is linked to our times tables structure. Children receive a practise sheet weekly to help them practise the skills and facts they are learning in class.

In upper Key Stage Two, children receive a weekly homework task linking with current learning in class. The aim of this homework is to allow children additional practise to secure knowledge and skills learnt.

In Reception, children do not receive weekly maths homework. Instead, when relevant you will find information about current mathematical learning on our weekly newsletters.

Assessing Mathematics

We use the Lingfield Education Trust's 25 objectives to assess children termly and at the end of each year. Within the 25 objectives there are 5 KPIs (Key Performance Indicators) which the children must meet. The KPIs in each year group are focused on the key concepts in the core areas of: number and place value, the four operations, times tables and division facts. At the end of each unit, teachers use appropriate assessments to assess the children's understanding of content taught as well as using evidence from work the children have completed in their books during the unit of work. In Reception, teachers use the Early Learning Goals and also follow the Trust Ready Document to assess children termly and at the end of the year. Evidence will be taken from observations in daily lessons and discussions with the children.