

## Mathematics at Exwick Heights Primary School

### **Overview**

At Exwick Heights, we have an aspirational mathematics curriculum where skills are embedded and developed consistently over time. We are committed to ensuring that children are able to recognise the importance of maths in the wider world and can use their mathematical skills and knowledge confidently in a range of different contexts. We want all children to enjoy mathematics and to experience success in the subject. We are committed to developing children's curiosity about the subject, as well as an appreciation of the beauty and power of mathematics.

The content and principles underpinning the Mathematics curriculum at Exwick Heights reflect those found in high-performing education systems internationally, particularly those of East and Southeast Asian countries such as Singapore, Japan, South Korea and China. These principles and features characterise this approach and convey how our curriculum is implemented:

- Teachers reinforce an expectation that all children are capable of achieving high standards in mathematics.
- The large majority of children progress through the curriculum content at the same pace. This is achieved by emphasising deep knowledge, through scaffolding, pre-teach, individual keep-up support and bespoke interventions.
- Teaching is underpinned by methodical curriculum design and supported by resources to foster deep conceptual and procedural knowledge.
- Practice, regular review and consolidation play a central role in children's progress. Carefully implemented variation within this builds an understanding of underlying mathematical concepts.
- Teachers use precise questioning to check conceptual and procedural knowledge; they use formative and summative assessment to identify those requiring intervention so that all children keep up.

To ensure whole school consistency and progression, the school uses the White Rose scheme in Years 1-6. In EYFS, we opted to follow the Mastering Number Program from October 2022 as it is fully funded and supported by the NCETM and Maths Hubs. In KS1, we are supplementing our daily maths lessons with the NCETM Mastering Number Program used in 20-minute discrete daily sessions.

School leaders, subject leads, year group leads and teachers work together. The school has developed its on going mastery approach for many years, completing the Mastery Workgroup for Years 1-6 (2019-2021 - Jurassic Maths Hub), the Early Years Mastery Workgroup for Foundation and Year 1 (2020-2022 - CODE Maths Hub) and the Mastering Number Program in EYFS and KS1 (2022-2023 Jurassic Maths Hub). In the academic year 2023-24 we are taking part in Sustaining Mastery Maths provided by the Jurassic Maths Hub.

Problem solving promotes an awareness of maths in relatable real-life contexts. Using the Concrete, Pictorial, Abstract approach, manipulatives and concrete materials are used throughout the school. Teachers use careful questions to draw out discussion and reasoning.

The class teacher then leads children through strategies for solving the problem, including those already discussed. Work set through the small step approach provides the means for all children to develop their fluency further, before progressing to more complex related problems. Mathematical topics are taught in blocks, to enable the achievement of 'mastery' over time. Each lesson provides the means to achieve greater depth, with higher attainers being offered rich and sophisticated problems, as well as exploratory, investigative tasks, within the lesson as appropriate.

## **Curriculum Principles**

### **By the end of their primary education, a pupil of Exwick Heights Primary School will:**

- 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.
- Reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- 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.

### **By the end of Early Years, pupils can...**

Count confidently and develop a deep understanding of the numbers to 10, recognise the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.

### **By the end of KS1, pupils can...**

The principal focus of mathematics teaching in key stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources [for example, concrete objects and measuring tools]. At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money. By the end of year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency.

### **By the end of KS2, pupils can...**

The principal focus of mathematics teaching in lower key stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value.

This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers. At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number. By the end of year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work.

**In order to achieve a true understanding of Maths, topics are sequenced based on the following rationale:**

- At Exwick, we follow the schemes of learning developed by White Rose and the NCETM (Mastering Number).
- Mathematics is an interconnected subject in which pupils need to be able to move fluently between 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. They should also apply their mathematical knowledge to science and other subjects.
- The expectation is that the majority of pupils will move through the programmes of study at the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should have learning deepened by undertaking rich and sophisticated problems. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

**The Maths curriculum will address social disadvantage by addressing gaps in students' knowledge and skills:**

- At Exwick, we provide relevant CPD to ensure that all staff are able to give the students the best quality first teaching (and interventions when appropriate).
- Teachers regularly assess children using elicitation and application tasks, termly NFER standardised tests and ongoing assessment for learning to ensure that misconceptions are addressed and intervention are put in place to support pupils who are not meeting their full potential.
- Through flexible grouping- enabling teachers to focus upon supporting children with similar needs.
- Children need to be discretely taught relevant lesson vocabulary.
- Children are supported using a range of scaffolds such as concrete and pictorial representations to expose the structure of maths and support their understanding of number.
- Our curriculum is sequenced using small steps so that learners are able to make links and move forward with their learning.
- Children, who are significantly behind their peers, follow an alternative curriculum to ensure they have full exposure to an appropriate maths education.
- At Exwick, we encourage all children to have a positive attitude to maths and have a can-do, resilient, attitude.

**We fully believe Maths can contribute to the personal development of students at Exwick Heights:**

- At Exwick, we believe learning early math will help a child think critically and problem solve effectively.
- Children will learn life skills such as how to tell the time recognise and use money in real-life contexts.
- Pupils will develop resilience when faced with a range of problems in a lesson. They will learn how to tackle sophisticated problems and break them down in to methodical steps.
- Children will learn how to develop their social competence within the class. Learn how to work with others, articulate ideas to justify and explain their answers.

**In each phase of learning, our belief is that homework should be a revision of powerful knowledge previously modelled and taught in lessons. This knowledge is recalled and applied through a range of quizzing and practice.**

## Curriculum Overview including Enrichment Opportunities

Year	Autumn	Spring	Summer
<b>Nursery</b>	In Nursery and Reception, children will learn to count confidently, develop a deep understanding of numbers to 10 and explore the relationships and patterns between those numbers. They will also develop spatial reasoning skills (shape, space, measure).		
<b>Reception</b>			
<b>Year 1</b>	Place Value (within 10) Addition and Subtraction (within 10) <b>Shape</b>	Place Value (within 20) Addition and Subtraction (within 20) Place Value (within 50) <b>Length and Height</b> <b>Mass and Volume</b>	Multiplication and Division Fractions <b>Position and Direction</b> Place value (within 100) <b>Money and Time</b>
<b>Year 2</b>	Place Value Addition and Subtraction <b>Shape</b>	<b>Money</b> Multiplication and Division <b>Length and Height</b> <b>Mass, capacity and temperature</b>	<b>Statistics</b> Fractions <b>Position and Direction</b> <b>Time</b>
<b>Year 3/4</b>	Place Value Addition and Subtraction Multiplication and Division	Multiplication and Division <b>Length, Perimeter and Area</b> Fractions <b>Y3: Mass and Capacity Y4: Decimals</b>	<b>Decimals (money)</b> <b>Time</b> <b>Statistics</b> <b>Properties of Shape (including Position and Direction)</b>
<b>Year 5</b>	Place Value Addition and Subtraction Multiplication and Division A Fractions A	Multiplication and Division Fractions B Decimals and Percentages <b>Perimeter and Area</b> <b>Statistics</b>	<b>Shape including Position and Direction</b> Decimals Negative Numbers <b>Converting Units</b> <b>Volume</b>
<b>Year 6</b>	Place Value Four Operations Fractions, Decimals and Percentages	Ratio and Proportion Algebra <b>Statistics</b> <b>Converting Units, Area, Perimeter, Volume</b> <b>Shape (including Position and Direction)</b>	Consolidation of Maths Skills and Deepening Understanding

Key: **Number**

**Measurement**

**Geometry**

**Statistics**

## **Our Spiral Curriculum**

All children are entitled to a curriculum and to the powerful knowledge, which will open doors and maximise their life chances. Below is a high-level overview of the critical knowledge children will learn in Maths at each stage of their primary education, from Nursery through to Year 6. The curriculum is planned vertically and horizontally giving thought to the optimum knowledge sequence for building secure schema. This curriculum overview shows the knowledge, skills and understanding at each stage of a child's Maths journey at Exwick Heights.

### **Nursery**

White Rose maths (as followed by the school) has not yet produced a scheme of learning for Nursery (3&4-year olds); therefore, we use Development Matters guidance to shape teaching and learning in this area for Nursery (learning intentions are highlighted in green below). Progression through the year has been modelled on the White Rose scheme of learning for Reception; this will be adapted as necessary throughout the year to ensure it meets the needs of the children.

AUTUMN	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
<b>Phase</b>	<b>Getting to know you</b>			<b>Just like me!</b>			<b>It is me 1, 2, 3!</b>			<b>Light &amp; dark</b>		
Number focus	Opportunities for settling in, introducing areas of EYFS provision and getting to know the children			<b>Match &amp; sort</b> <ul style="list-style-type: none"> <li>Compare amounts</li> <li>Compare quantities using language: 'more than', 'fewer than'.</li> </ul>			<b>Representing 1,2 &amp; 3</b> <ul style="list-style-type: none"> <li>Comparing 1,2 &amp; 3</li> <li>Composition of 1,2 &amp; 3</li> <li>Fast recognition of up to 3 objects, without having to count them individually ('subitising').</li> <li>Say one number for each item in order: 1, 2, 3.</li> <li>Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle').</li> <li>Show 'finger numbers' up to 3.</li> <li>Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 3.</li> <li>Experiment with their own symbols and marks as well as numerals.</li> <li>Solve real world mathematical problems with numbers up to 3.</li> </ul>			<b>Representing numbers to 5</b> <ul style="list-style-type: none"> <li>One more and less</li> <li>Fast recognition of up to 3 objects, without having to count them individually ('subitising').</li> <li>Say one number for each item in order: 1, 2,3,4,5.</li> <li>Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle').</li> <li>Show 'finger numbers' to 5.</li> <li>Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5.</li> <li>Experiment with their own symbols and marks as well as numerals.</li> <li>Solve real world mathematical problems with numbers up to 5.</li> <li>Recite numbers past 5.</li> </ul>		

Measure, shape and spatial thinking	Key times of the day and class routines. Exploring the provision inside and out. Identifying where things belong. Positional language.			<b>Compare size, mass &amp; capacity</b> Make comparisons between objects relating to size, length, weight and capacity.  <b>Exploring pattern</b> Talk about and identifies the patterns around them. For example: stripes on clothes, designs on rugs and wallpaper. Use informal language like 'pointy', 'spotty', 'blobs' etc.			<b>Circles and triangles</b> Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language: 'sides', 'corners'; 'straight', 'flat', 'round'.  <b>Positional Language</b> Understand position through words alone – for example, "The bag is under the table," –with no pointing.			<b>Shapes with 4 sides</b> Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language: 'sides', 'corners'; 'straight', 'flat', 'round'.  <b>Time</b> Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then...'.		
	SPRING	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9		
Phase	<b>Alive in 5!</b>			<b>Growing 6,7,8</b>			<b>Building 9 &amp; 10</b>					
Number focus	<b>Introducing zero</b> <b>Comparing number to 5</b> <b>Composition of 4 &amp; 5</b> <ul style="list-style-type: none"> <li>Fast recognition of up to 3 objects, without having to count them individually ('subitising').</li> <li>Say one number for each item in order: 1, 2,3,4,5.</li> <li>Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle').</li> <li>Show 'finger numbers' up to 5.</li> <li>Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5.</li> <li>Experiment with their own symbols and marks as well as numerals.</li> <li>Solve real world mathematical problems with numbers up to 5.</li> <li>Recite numbers past 5.</li> </ul>			<b>6,7, 8</b> <b>Making pairs</b> <b>Combining 2 groups</b> <ul style="list-style-type: none"> <li>Fast recognition of up to 3 objects, without having to count them individually ('subitising').</li> <li>Say one number for each item in order: 1, 2,3,4,5.</li> <li>Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle').</li> <li>Show 'finger numbers' up to 5.</li> <li>Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5.</li> <li>Experiment with their own symbols and marks as well as numerals.</li> <li>Solve real world mathematical problems with numbers up to 5.</li> <li>Recite numbers past 5.</li> </ul>			<b>9 &amp; 10</b> <b>Comparing numbers to 10</b> <b>Bonds to 10</b> <ul style="list-style-type: none"> <li>Fast recognition of up to 3 objects, without having to count them individually ('subitising').</li> <li>Say one number for each item in order: 1, 2,3,4,5.</li> <li>Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle').</li> <li>Show 'finger numbers' up to 5.</li> <li>Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5.</li> <li>Experiment with their own symbols and marks as well as numerals.</li> <li>Solve real world mathematical problems with numbers up to 5.</li> <li>Recite numbers past 5.</li> </ul>					



Measure, shape and spatial thinking	<b>Compare mass (2)</b> <b>Compare capacity (2)</b> <i>Make comparisons between objects relating to size, length, weight and capacity.</i>			<b>Length &amp; Height</b> <i>Make comparisons between objects relating to size, length, weight and capacity.</i>			<b>3D shape</b> Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language: 'sides', 'corners'; 'straight', 'flat', 'round'.					
	<b>Time</b> Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then'			<b>Pattern (2)</b> Extend and create ABAB patterns – stick, leaf, stick, leaf. Notice and correct an error in a repeating pattern.								
SUMMER	<b>Week 1</b>	<b>Week 2</b>	<b>Week 3</b>	<b>Week 4</b>	<b>Week 5</b>	<b>Week 6</b>	<b>Week 7</b>	<b>Week 8</b>	<b>Week 9</b>	<b>Week 10</b>	<b>Week 11</b>	<b>Week 12</b>
<b>Phase</b>	<b>To 20 and beyond</b>			<b>First, Then, Now</b>			<b>Find my pattern</b>			<b>On the move</b>		
Number focus	Building number beyond 10 Counting patterns beyond 10 <i>(Consolidation of number work)</i>			Adding more Taking away <i>(Consolidation of number work)</i>			Doubling Sharing & grouping Even & odd <i>(Consolidation of number work)</i>			Deepening understanding Patterns & relationships <i>(Consolidation of number work)</i>		
Measure, shape and spatial thinking	<b>Spatial reasoning (1)</b> <b>Match, rotate, manipulate</b> Select shapes appropriately: flat surfaces for building, a triangular prism for a roof etc. Combine shapes to make new ones - an arch, a bigger triangle etc.			<b>Spatial reasoning (2)</b> <b>Compose and decompose</b> <i>Select shapes appropriately: flat surfaces for building, a triangular prism for a roof etc. Combine shapes to make new ones - an arch, a bigger triangle etc.</i>			<b>Spatial reasoning (3)</b> <i>Select shapes appropriately: flat surfaces for building, a triangular prism for a roof etc. Combine shapes to make new ones - an arch, a bigger triangle etc.</i>			<b>Spatial reasoning (4)</b> <b>Mapping</b> Describe a familiar route. Discuss routes and locations, using words like 'in front of' and 'behind'.		

## Reception

In Reception, we follow the Mastering Number Program (as of October 2022) developed by the NCETM and Maths Hubs to support our children to build deep foundations in number. The scheme aims to secure firm foundations in the development of good number sense for all children from Reception through to Year 1 and Year 2. The aim over time is that children will leave KS1 with fluency in calculation and a confidence and flexibility with number. Attention will be given to key knowledge and understanding needed in Reception classes, and progression through KS1 to support success in the future.

		Autumn	Spring	Summer
Phase		Getting to know you	Just like me!	It is me 1, 2, 3!
		<p>Pupils will build on previous experiences of number from their home and nursery environments, and further develop their subitising and counting skills. They will explore the composition of numbers within 5. They will begin to compare sets of objects and use the language of comparison.</p> <p><b>Pupils will:</b></p> <ul style="list-style-type: none"> <li>Identify when a set can be subitised and when counting is needed</li> <li>Subitise different arrangements, both unstructured and structured, including using the Hungarian number frame</li> <li>Make different arrangements of numbers within 5 and talk about what they can see, to develop their conceptual subitising skills</li> <li>Spot smaller numbers 'hiding' inside larger numbers</li> <li>Connect quantities and numbers to finger patterns and explore different ways of representing numbers on their fingers</li> </ul>	<p>Pupils will continue to develop their subitising and counting skills and explore the composition of numbers within and beyond 5. They will begin to identify when two sets are equal or unequal and connect two equal groups to doubles. They will begin to connect quantities to numerals.</p> <p><b>Pupils will:</b></p> <ul style="list-style-type: none"> <li>Continue to develop their subitising skills for numbers within and beyond 5, and increasingly connect quantities to numerals</li> <li>Begin to identify missing parts for numbers within 5</li> <li>Explore the structure of the numbers 6 and 7 as '5 and a bit' and connect this to finger patterns and the Hungarian number frame</li> <li>Focus on equal and unequal groups when comparing numbers.</li> <li>understand that two equal groups can be called a 'double' and connect this to finger patterns</li> </ul>	<ul style="list-style-type: none"> <li>Pupils will consolidate their counting skills, counting to larger numbers and developing a wider range of counting strategies. They will secure knowledge of number facts through varied practice.</li> </ul> <p><b>Pupils will:</b></p> <ul style="list-style-type: none"> <li>Continue to develop their counting skills, counting larger sets as well as counting actions and sounds</li> <li>Explore a range of representations of numbers, including the 10-frame, and see how doubles can be arranged in a 10-frame</li> <li>Compare quantities and numbers, including sets of objects which have different attributes</li> <li>Continue to develop a sense of magnitude, e.g. knowing that 8 is quite a lot more than 2, but 4 is only a little bit more than 2.</li> <li>Begin to generalise about 'one more than' and 'one less than' numbers within 10</li> </ul>

		<ul style="list-style-type: none"> <li>• Hear and join in with the counting sequence, and connect this to the 'staircase' pattern of the counting numbers, seeing that each number is made of one more than the previous number</li> <li>• Develop counting skills and knowledge, including: that the last number in the count tells us 'how many' (cardinality); to be accurate in counting, each thing must be counted once and once only and in any order; the need for 1:1 correspondence; understanding that anything can be counted, including actions and sounds</li> <li>• Compare sets of objects by matching</li> <li>• Begin to develop the language of 'whole' when talking about objects which have parts.</li> </ul>	<ul style="list-style-type: none"> <li>• Sort odd and even numbers according to their 'shape'</li> <li>• Continue to develop their understanding of the counting sequence and link cardinality and ordinality through the 'staircase' pattern</li> <li>• Order numbers and play track games</li> <li>• Join in with verbal counts beyond 20, hearing the repeated pattern within the counting numbers.</li> </ul>	<ul style="list-style-type: none"> <li>• Continue to identify when sets can be subitised and when counting is necessary</li> <li>• Develop conceptual subitising skills including when using a rekenrek.</li> </ul>
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## Year 1

We use the White Rose programme to shape teaching and learning - **a mastery approach**. In KS1, we also have daily 20-minute mastering number sessions to ensure development of good number sense for all children.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number <b>Place value (within 10)</b>					Number <b>Addition and subtraction (within 10)</b>					Geometry <b>Shape</b>	Consolidation
Spring	Number <b>Place value (within 20)</b>			Number <b>Addition and subtraction (within 20)</b>			Number <b>Place value (within 50)</b>		Measurement <b>Length and height</b>		Measurement <b>Mass and volume</b>	
Summer	Number <b>Multiplication and division</b>			Number <b>Fractions</b>		Geometry <b>Position and direction</b>	Number <b>Place value (within 100)</b>		Measurement <b>Money</b>	Measurement <b>Time</b>		Consolidation

		Autumn	Spring	Summer
Year 1	Knowledge introduced	<p><b>Numbers to 10</b></p> <ul style="list-style-type: none"> <li>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.</li> <li>Identify one more and one less of a given number.</li> <li>Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number.</li> <li>Count, read and write numbers to 100 in numerals; count in multiples of 2, 5 and 10.</li> <li>Read and write numbers from 1 to 20 in numerals and words.</li> <li>Represent and use number bonds and related subtraction facts within 10.</li> <li>Read and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs.</li> </ul> <p><b>Addition and subtraction within 10</b></p> <ul style="list-style-type: none"> <li>Represent and use number bonds and related subtraction facts within 20.</li> <li>Read and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs. Solve one -step problems that involve addition, subtraction and missing numbers using concrete objects and pictorial representations.</li> </ul>	<p><b>Numbers to 20</b></p> <ul style="list-style-type: none"> <li>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.</li> <li>Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number.</li> <li>Identify one more and one less of a given number.</li> <li>Recognise the place value of each digit in a two -digit number (tens, ones).</li> <li>Compare and order numbers from 0 up to 100; use and = signs.</li> </ul> <p><b>Addition within 20</b></p> <ul style="list-style-type: none"> <li>Add and subtract one digit and two-digit numbers to 20, including zero.</li> <li>Represent and use number bonds and related subtraction facts within 20.</li> <li>Solve one-step problems that involve addition, subtraction and missing numbers using concrete objects and pictorial representations.</li> </ul> <p><b>Subtraction within 20</b></p> <ul style="list-style-type: none"> <li>Add and subtract one digit and two-digit numbers to 20, including zero.</li> <li>Represent and use number bonds and related subtraction facts within 20.</li> </ul>	<p><b>Multiplication</b></p> <ul style="list-style-type: none"> <li>Count, read and write numbers to 100 in numerals; count in multiples of 2, 5, 10.</li> <li>Solve one-step problems involving multiplication by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.</li> </ul> <p><b>Division</b></p> <ul style="list-style-type: none"> <li>Solve one-step problems involving division by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.</li> <li>Recognise, find and name a half as one of two equal parts of an object, shape or quantity.</li> <li>Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.</li> </ul> <p><b>Position and direction</b></p> <ul style="list-style-type: none"> <li>Describe position, direction and movement, including whole, half, quarter and three-quarter turns.</li> </ul> <p><b>Numbers to 100</b></p> <ul style="list-style-type: none"> <li>Count, read and write numbers to 100 in numerals; count in multiples of 2, 5, 10.</li> </ul>

	<ul style="list-style-type: none"> <li>• Represent and use number bonds and related subtraction facts within 20. Solve one-step problems that involve addition, subtraction and missing numbers using concrete objects and pictorial representations.</li> <li>• Read and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs.</li> </ul> <p><b>2D and 3D shapes</b></p> <ul style="list-style-type: none"> <li>• Recognise and name common 2-D shapes e.g. rectangles (including squares), circles and triangles.</li> <li>• Recognise and name common 3-D shapes e.g. cuboids (including cubes), pyramids and spheres.</li> <li>• Recognise and create repeating patterns with objects and with shapes.</li> </ul>	<ul style="list-style-type: none"> <li>• Solve one-step problems that involve addition, subtraction and missing numbers using concrete objects and pictorial representations.</li> <li>• Read and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs.</li> </ul> <p><b>Numbers to 50</b></p> <ul style="list-style-type: none"> <li>• Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number.</li> <li>• 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.</li> <li>• Recognise the place value of each digit in a two -digit number (tens, ones).</li> <li>• Identify one more and one less of a given number.</li> <li>• Solve one -step problems that involve addition, subtraction and missing numbers using concrete objects and pictorial representations.</li> <li>• Count, read and write numbers to 100 in numerals; count in multiples of 2, 5 and 10.</li> <li>• Compare and order numbers from 0 up to 100; use and = signs.</li> </ul> <p><b>Introducing length and height</b></p> <ul style="list-style-type: none"> <li>• Compare, describe and solve practical problems for lengths and heights e.g. long/short, longer/shorter, tall/short, double/half.</li> <li>• Measure and begin to record length/height.</li> </ul>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number.</li> <li>• Identify one more and one less of a given number.</li> <li>• Recognise the place value of each digit in a two-digit number (tens, ones).</li> <li>• Represent and use number bonds and related subtraction facts within 20.</li> </ul> <p><b>Time</b></p> <ul style="list-style-type: none"> <li>• Sequence events in chronological order using language e.g. before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening.</li> <li>• Compare, describe and solve practical problems for time e.g. quicker, slower, earlier, later.</li> <li>• Measure and begin to record time (hours, minutes, seconds).</li> <li>• Recognise and use language relating to dates, including days of the week, weeks, months and years.</li> <li>• Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.</li> <li>• Solve one -step problems that involve addition, subtraction and missing numbers using concrete objects and pictorial representations.</li> </ul>
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	<p><b>Knowledge revisited</b></p>	<p>All teaching embeds and builds upon prior learning from EYFS.</p>		

## Year 2

We use the White Rose programme to shape teaching and learning - **a mastery approach**. In KS1, we also have daily 20-minute mastering number sessions to ensure development of good number sense for all children.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number <b>Place value</b>				Number <b>Addition and subtraction</b>					Geometry <b>Shape</b>		
Spring	Measurement <b>Money</b>	Number <b>Multiplication and division</b>					Measurement <b>Length and height</b>		Measurement <b>Mass, capacity and temperature</b>			
Summer	Statistics		Number <b>Fractions</b>		Geometry <b>Position and direction</b>		Problem solving		Measurement <b>Time</b>			



		Autumn	Spring	Summer
Year 2	Knowledge introduced	<p><b>Place Value to 100</b></p> <ul style="list-style-type: none"> <li>Count, read and write numbers to 100 in numerals; count in multiples of 2, 5 and 10.</li> <li>Recognise the place value of each digit in a two-digit number (tens, ones).</li> <li>Compare and order numbers from 0 up to 100; use and = signs.</li> <li>Identify, represent and estimate numbers using different representations, including the number line.</li> <li>Count in steps of 2, 3 and 5 from 0 and in 10s from any number, forward and backward</li> </ul> <p><b>Addition and Subtraction</b></p> <ul style="list-style-type: none"> <li>Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100.</li> <li>Solve problems with addition and subtraction using concrete objects and pictorial representations, including those involving numbers, quantities and measures.</li> <li>Add and subtract numbers where no regrouping is required, using concrete objects, pictorial representations, and mentally, including a two-digit number and ones.</li> <li>Count in steps of 2, 3 and 5 from 0 and in 10s from any number, forward and backward</li> </ul>	<p><b>Money</b></p> <ul style="list-style-type: none"> <li>Recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value.</li> <li>Recognise and know the value of different denominations of coins and notes. (Y1)</li> <li>Find different combinations of coins that equal the same amounts of money. Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change.</li> </ul> <p><b>Multiplication and Division</b></p> <ul style="list-style-type: none"> <li>Solve one-step problems involving multiplication by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher. (Y1)</li> <li>Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (<math>\times</math>), division (<math>\div</math>) and equals (=) signs.</li> <li>Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers.</li> </ul>	<p><b>Statistics</b></p> <ul style="list-style-type: none"> <li>Interpret and construct simple pictograms, tally charts, block diagrams and simple tables.</li> <li>Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity.</li> <li>Ask and answer questions about totalling and comparing categorical data.</li> </ul> <p><b>Fractions</b></p> <ul style="list-style-type: none"> <li>Recognise, find and name a half as one of two equal parts of an object, shape or quantity. (Y1)</li> <li>Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity. (Y1)</li> <li>Recognise, find, name and write fractions <math>\frac{1}{3}</math>, <math>\frac{1}{4}</math>, <math>\frac{2}{4}</math> and <math>\frac{3}{4}</math> of a length, shape, set of objects or quantity and demonstrate understanding that all parts must be equal parts of the whole.</li> <li>Write simple fractions for example, <math>\frac{1}{2}</math> of <math>6 = 3</math> and recognise the equivalence of <math>\frac{2}{4}</math> and <math>\frac{1}{2}</math>.</li> </ul>

	<ul style="list-style-type: none"> <li>• Add and subtract numbers using concrete objects, pictorial representations, and mentally, including a two-digit number and tens.</li> <li>• Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.</li> <li>• Show that addition of two numbers can be done in any order (commutative law) and subtraction of one number from another cannot.</li> <li>• Solve problems with addition and subtraction: applying their increasing knowledge of mental and written methods.</li> <li>• Add and subtract numbers using concrete objects, pictorial representations, and mentally, including two two-digit numbers. Solve problems with addition and subtraction: applying their increasing knowledge of mental and written methods.</li> <li>• Add and subtract numbers using concrete objects, pictorial representations, and mentally, adding three 1-digit numbers. Solve problems with addition and subtraction using concrete objects and pictorial representations, including those involving numbers, quantities and measures.</li> </ul> <p><b>Properties of shapes</b></p> <ul style="list-style-type: none"> <li>• Identify and describe properties of 2-D shapes (number of sides &amp; line symmetry)</li> <li>• Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces.</li> <li>• Compare and sort common 2D and 3D shapes and everyday objects.</li> </ul>	<ul style="list-style-type: none"> <li>• Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods and multiplication and division facts, including problems in context.</li> <li>• Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (<math>\times</math>), division (<math>\div</math>) and equals (=) signs.</li> <li>• Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers.</li> <li>• Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods and multiplication and division facts, including problems in context.</li> </ul> <p><b>Length and height</b></p> <ul style="list-style-type: none"> <li>• Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (<math>^{\circ}\text{C}</math>); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels.</li> <li>• Compare and order lengths, mass, volume/capacity and record the results using <math>&gt;</math>, <math>&lt;</math> and <math>=</math>.</li> <li>• Solve problems with addition and subtraction using concrete objects and pictorial representations, including those involving numbers, quantities and measures.</li> </ul>	<p><b>Position and direction</b></p> <ul style="list-style-type: none"> <li>• Use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anticlockwise).</li> <li>• Order and arrange combinations of mathematical objects in patterns and sequences</li> </ul> <p><b>Time</b></p> <ul style="list-style-type: none"> <li>• Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times. (Y1)</li> <li>• Compare and sequence intervals of time Tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times.</li> <li>• Tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times.</li> <li>• Remember the number of minutes in an hour and the number of hours in a day Read the time on a clock to the nearest 15 minutes.</li> </ul>
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	<ul style="list-style-type: none"> <li>Order and arrange combinations of mathematical objects in patterns and sequences.</li> </ul>	<p><b>Weight, volume and temperature</b></p> <ul style="list-style-type: none"> <li>Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels.</li> <li>Compare and order lengths, mass, volume/capacity and record the results using &gt;, &lt; and =.</li> </ul>	
<p><b>Knowledge revisited</b></p>	<p>All teaching embeds and builds upon prior learning from EYFS and Year 1.</p>		

### Year 3

We use the White Rose programme to shape teaching and learning - **a mastery approach.**

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number <b>Place value</b>			Number <b>Addition and subtraction</b>				Number <b>Multiplication and division A</b>				
Spring	Number <b>Multiplication and division B</b>			Measurement <b>Length and perimeter</b>			Number <b>Fractions A</b>		Measurement <b>Mass and capacity</b>			
Summer	Number <b>Fractions B</b>		Measurement <b>Money</b>	Measurement <b>Time</b>			Geometry <b>Shape</b>		Statistics		Consolidation	

		Autumn	Spring	Summer
<b>Year 3</b>	<b>Knowledge introduced</b>	<p><b>Place Value within 1,000</b></p> <ul style="list-style-type: none"> <li>Recognise the place value of each digit in a three-digit number (hundreds, tens, ones). Read and write numbers up to 1000 in numerals.</li> <li>Read and write numbers up to 1000 in words.</li> <li>Identify, represent and estimate numbers using different representations.</li> <li>Compare and order numbers up to 1,000.</li> <li>Count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number.</li> <li>Solve number problems and practical problems involving these ideas.</li> </ul> <p><b>Addition and subtraction</b></p> <ul style="list-style-type: none"> <li>Add and subtract numbers mentally, including a three-digit number and ones</li> <li>Add and subtract numbers mentally, including a three-digit number and tens.</li> <li>Add and subtract numbers mentally, including a three-digit number and hundreds.</li> <li>Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.</li> <li>Add and subtract numbers with up to three digits, using the formal method of columnar addition and subtraction.</li> </ul>	<p><b>Length</b></p> <ul style="list-style-type: none"> <li>Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml).</li> <li>Measure the perimeter of simple 2-D shapes.</li> </ul> <p><b>Fractions</b></p> <ul style="list-style-type: none"> <li>Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10.</li> <li>Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators.</li> <li>Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.</li> <li>Compare and order unit fractions, and fractions with the same denominators.</li> </ul> <p><b>Mass and Capacity</b></p> <ul style="list-style-type: none"> <li>Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml).</li> <li>Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml).</li> </ul>	<p><b>Money</b></p> <ul style="list-style-type: none"> <li>Add and subtract amounts of money to give change, using both £ and p in practical contexts.</li> </ul> <p><b>Time</b></p> <ul style="list-style-type: none"> <li>Tell the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks.</li> <li>Write the time using an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks.</li> <li>Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight.</li> <li>Know the number of seconds in a minute and the number of days in each month, year and leap year.</li> <li>Compare durations of events e.g. to calculate the time taken by particular events or tasks.</li> </ul> <p><b>Statistics</b></p> <ul style="list-style-type: none"> <li>Interpret and present data using bar charts, pictograms and tables. Solve one-step and twostep questions e.g. 'How many more?' and 'How many fewer?' using information presented in scaled bar charts and pictograms and tables.</li> </ul>

- Add and subtract numbers mentally, including a three-digit number and ones
- Add and subtract numbers mentally, including a three-digit number and tens.
- Add and subtract numbers mentally, including a three-digit number and hundreds.
- Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.
- Add and subtract numbers with up to three digits, using the formal method of columnar addition and subtraction.
- Estimate the answer to a calculation and use inverse operations to check answers

**Multiplication and division**

- Write and calculate mathematical statements for multiplication and division using the multiplication tables that he/she knows, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods.
- Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables.
- Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.

**Angles and properties of shape**

- Recognise angles as a property of shape or a description of a turn.
- Identify right angles and identify whether other angles are greater or less than a right angle.
- Recognise that two right angles make a half turn, three make three quarters of a turn and four a complete turn Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them.
- Identify horizontal and vertical lines and pairs of perpendicular and parallel lines

	<p><b>Multiplication and division</b></p> <ul style="list-style-type: none"> <li>• Write and calculate mathematical statements for multiplication and division using the multiplication tables that he/she knows, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods.</li> <li>• Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables.</li> <li>• Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which objects are connected to m objects.</li> </ul>		
<p><b>Knowledge revisited</b></p>	<p>All teaching embeds and builds upon prior learning from EYFS, Year 1 and Year 2</p>		

## Year 4

We use the White Rose programme to shape teaching and learning - **a mastery approach.**

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number <b>Place value</b>				Number <b>Addition and subtraction</b>			Measurement <b>Area</b>	Number <b>Multiplication and division A</b>			Consolidation
Spring	Number <b>Multiplication and division B</b>			Measurement <b>Length and perimeter</b>		Number <b>Fractions</b>				Number <b>Decimals A</b>		
Summer	Number <b>Decimals B</b>	Measurement <b>Money</b>		Measurement <b>Time</b>		Consolidation	Geometry <b>Shape</b>		Statistics	Geometry <b>Position and direction</b>		



		Autumn	Spring	Summer
<b>Year 4</b>	<b>Knowledge introduced</b>	<p><b>Place value – 4-digit numbers</b></p> <ul style="list-style-type: none"> <li>Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones).</li> <li>Round any number to the nearest 10, 100 or 1000.</li> <li>Count in multiples of 6, 7, 9, 25 and 1000.</li> <li>Identify, represent and estimate numbers using different representations including measures.</li> <li>Order and compare numbers beyond 1000.</li> <li>Read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value.</li> <li>Find 1000 more or less than a given number.</li> <li>Identify, represent and estimate numbers using different representations including measures.</li> <li>Order and compare numbers beyond 1000.</li> <li>Count in multiples of 6, 7, 9, 25 and 1000.</li> <li>Round any number to the nearest 10, 100 or 1000.</li> <li>Solve number and practical problems that involve all of the above and with increasingly large positive numbers.</li> <li>Count backwards through zero to include negative numbers.</li> </ul>	<p><b>Measure – Perimeter and Area</b></p> <ul style="list-style-type: none"> <li>Convert between different units of measure e.g. kilometre to metre; hour to minute</li> <li>Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres.</li> <li>Find the area of rectilinear shapes by counting squares.</li> <li>Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.</li> <li>Estimate, compare and calculate different measures, including money in pounds and pence.</li> </ul> <p><b>Fractions</b></p> <ul style="list-style-type: none"> <li>Recognise and show, using diagrams, families of common equivalent fractions.</li> <li>Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number.</li> <li>Add and subtract fractions with the same denominator.</li> <li>Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number.</li> </ul>	<p><b>Money</b></p> <ul style="list-style-type: none"> <li>Solve simple measure and money problems involving fractions and decimals to two decimal places.</li> <li>Estimate, compare and calculate different measures, including money in pounds and pence.</li> </ul> <p><b>Time</b></p> <ul style="list-style-type: none"> <li>Convert between different units of measure e.g. kilometre to metre; hour to minute.</li> </ul> <p><b>Statistics</b></p> <ul style="list-style-type: none"> <li>Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.</li> <li>Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.</li> </ul> <p><b>Geometry – angles and 2D shapes</b></p> <ul style="list-style-type: none"> <li>Identify acute and obtuse angles and compare and order angles up to two right angles by size.</li> </ul>

	<ul style="list-style-type: none"> <li>Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero.</li> </ul> <p><b>Addition and subtraction</b></p> <ul style="list-style-type: none"> <li>Add numbers with up to four digits using the formal method of columnar addition.</li> <li>Subtract numbers with up to four digits using the formal method of columnar subtraction.</li> <li>Solve number and practical problems that involve all of the above and with increasingly large positive numbers.</li> <li>Round any number to the nearest 10, 100 or 1000.</li> <li>Estimate and use inverse operations to check answers to a calculation.</li> <li>Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.</li> </ul> <p><b>Multiplication and division</b></p> <ul style="list-style-type: none"> <li>Recall multiplication and division facts for multiplication tables up to <math>12 \times 12</math>.</li> <li>Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers.</li> <li>Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days</li> <li>Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.</li> </ul>	<p><b>Decimals</b></p> <ul style="list-style-type: none"> <li>Recognise and write decimal equivalents of any number of tenths or hundredths.</li> <li>Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths.</li> <li>Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.</li> <li>Solve simple measure and money problems involving fractions and decimals to two decimal places.</li> <li>Recognise and write decimal equivalents of any number of tenths or hundredths.</li> <li>Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths.</li> <li>Add and subtract fractions with the same denominator.</li> <li>Compare numbers with the same number of decimal places up to two decimal places.</li> <li>Round decimals with one decimal place to the nearest whole number.</li> <li>Recognise and write decimal equivalents to <math>\frac{1}{4}</math>, <math>\frac{1}{2}</math>, <math>\frac{3}{4}</math>.</li> <li>Solve simple measure and money problems involving fractions and decimals to two decimal places.</li> </ul>	<ul style="list-style-type: none"> <li>Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes. Identify lines of symmetry in 2-D shapes presented in different orientations.</li> <li>Complete a simple symmetric figure with respect to a specific line of symmetry.</li> </ul> <p><b>Geometry – position and direction</b></p> <ul style="list-style-type: none"> <li>Describe positions on a 2-D grid as coordinates in the first quadrant.</li> <li>Describe movements between positions as translations of a given unit to the left/right and up/down.</li> <li>Plot specified points and draw sides to complete a given polygon.</li> </ul>
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	<b>Knowledge revisited</b>	All teaching embeds and builds upon prior learning from EYFS, Year 1, Year 2 and Year 3.		

## Year 5

We use the White Rose programme to shape teaching and learning - **a mastery approach.**

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number <b>Place value</b>			Number <b>Addition and subtraction</b>		Number <b>Multiplication and division A</b>			Number <b>Fractions A</b>			
Spring	Number <b>Multiplication and division B</b>			Number <b>Fractions B</b>		Number <b>Decimals and percentages</b>			Measurement <b>Perimeter and area</b>		Statistics	
Summer	Geometry <b>Shape</b>			Geometry <b>Position and direction</b>		Number <b>Decimals</b>			Number <b>Negative numbers</b>	Measurement <b>Converting units</b>		Measurement <b>Volume</b>

		Autumn	Spring	Summer
Year 5	Knowledge introduced	<p><b>Place value within 100,000</b></p> <ul style="list-style-type: none"> <li>Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit.</li> <li>Round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 10, 000.</li> <li>Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000.</li> <li>Solve number and practical problems.</li> <li>Read Roman numerals to 1000 (M) and recognise years written in Roman numerals.</li> </ul>	<p><b>Multiplication and Division B</b></p> <ul style="list-style-type: none"> <li>Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers.</li> <li>Multiply and divide numbers mentally drawing upon known facts.</li> <li>Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context.</li> </ul>	<p><b>Geometry – properties of shapes</b></p> <ul style="list-style-type: none"> <li>Identify angles at a point and one whole turn (total 360°).</li> <li>Identify angles at a point on a straight line and 1/2 a turn (total 180°).</li> <li>Identify other multiples of 90°.</li> <li>Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles.</li> <li>Draw given angles, and measure them in degrees (°).</li> <li>Use the properties of rectangles to deduce related facts and find missing lengths and angles.</li> </ul>
		<p><b>Place value within 1,000,000</b></p> <ul style="list-style-type: none"> <li>Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit.</li> <li>Round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 10, 000.</li> <li>Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000.</li> <li>Solve number and practical problems. Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero.</li> </ul>	<p><b>Fractions</b></p> <ul style="list-style-type: none"> <li>Identify and name equivalent fractions of a given fraction, represented visually, including tenths and hundredths.</li> <li>Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements <math>&gt;</math> 1 as a mixed number e.g. <math>\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1 \frac{1}{5}</math>.</li> <li>Compare and order fractions whose denominators are all multiples of the same number.</li> <li>Add and subtract fractions with the same denominator and denominators that are multiples of the same number.</li> <li>Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements <math>&gt;</math></li> </ul>	<ul style="list-style-type: none"> <li>Identify angles at a point and one whole turn (total 360°).</li> <li>Identify angles at a point on a straight line and 1/2 a turn (total 180°).</li> <li>Identify other multiples of 90°.</li> <li>Draw given angles, and measure them in degrees (°).</li> <li>Use the properties of rectangles to deduce related facts and find missing lengths and angles.</li> <li>Identify 3-D shapes, including cubes and other cuboids, from 2-D representations.</li> <li>Distinguish between regular and irregular polygons based on reasoning about equal sides and angles.</li> </ul>

		<p><b>Addition and subtraction</b></p> <ul style="list-style-type: none"> <li>Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction).</li> <li>Add and subtract numbers mentally with increasingly large numbers.</li> <li>Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.</li> <li>Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.</li> </ul> <p><b>Multiplication and Division A</b></p> <ul style="list-style-type: none"> <li>Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.</li> <li>Know and use the vocabulary of prime numbers, prime factors and composite (nonprime) numbers.</li> <li>Establish whether a number up to 100 is prime and recall prime numbers up to 19. Recognise and use square numbers and the notation for squared (2).</li> <li>Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes.</li> <li>Recognise and use cube numbers and the notation for cubed (3).</li> <li>Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates</li> <li>Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.</li> </ul>	<p>1 as a mixed number e.g. <math>2/5 + 4/5 = 6/5 = 1 \frac{1}{5}</math>.</p> <ul style="list-style-type: none"> <li>Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.</li> <li>Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements &gt; 1 as a mixed number e.g. <math>2/5 + 4/5 = 6/5 = 1 \frac{1}{5}</math>.</li> </ul> <p><b>Decimals and percentages</b></p> <ul style="list-style-type: none"> <li>Read, write, order and compare numbers with up to three decimal places.</li> <li>Read and write decimal numbers as fractions e.g. <math>0.71 = 71/100</math>.</li> <li>Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.</li> <li>Round decimals with two decimal places to the nearest whole number and to one decimal place.</li> <li>Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal.</li> <li>Solve problems which require knowing percentage and decimal equivalents of <math>1/2</math>, <math>1/4</math>, <math>1/5</math>, <math>2/5</math>, <math>4/5</math> and those fractions with a denominator of a multiple of 10 or 25.</li> <li>Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths.</li> </ul>	<p><b>Geometry – position and direction</b></p> <ul style="list-style-type: none"> <li>Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed.</li> </ul> <p><b>Decimals</b></p> <ul style="list-style-type: none"> <li>Solve problems involving number up to three decimal places.</li> <li>Read, write, order and compare numbers with up to three decimal places.</li> <li>Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.</li> </ul> <p><b>Measure – converting units</b></p> <ul style="list-style-type: none"> <li>Convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre).</li> <li>Use all four operations to solve problems involving measure e.g. length, mass, volume, money using decimal notation, including scaling.</li> <li>Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints.</li> <li>Solve problems involving converting between units of time.</li> </ul> <p><b>Measure – volume and capacity</b></p> <ul style="list-style-type: none"> <li>Estimate volume e.g. using <math>1 \text{ cm}^3</math> blocks to build cuboids (including cubes) and capacity e.g. using water.</li> </ul>
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	<p><b>Fractions</b></p> <ul style="list-style-type: none"> <li>Identify and name equivalent fractions of a given fraction, represented visually, including tenths and hundredths.</li> <li>Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements <math>&gt; 1</math> as a mixed number e.g. <math>2/5 + 4/5 = 6/5 = 1 \frac{1}{5}</math>.</li> <li>Compare and order fractions whose denominators are all multiples of the same number.</li> <li>Add and subtract fractions with the same denominator and denominators that are multiples of the same number.</li> <li>Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements <math>&gt; 1</math> as a mixed number e.g. <math>2/5 + 4/5 = 6/5 = 1 \frac{1}{5}</math>.</li> </ul>	<p><b>Measure – area and perimeter</b></p> <ul style="list-style-type: none"> <li>Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres</li> <li>Calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm<sup>2</sup>) and square metres (m<sup>2</sup>) and estimate the area of irregular shapes.</li> </ul>	
<p><b>Knowledge revisited</b></p>	<p>All teaching embeds and builds upon prior learning from EYFS – Y3/4.</p>		

**Year 6**

We use the White Rose programme to shape teaching and learning - **a mastery approach.**

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
<i>Autumn</i>	<i>Place Value</i>		<i>4 Operations</i>			<i>Fractions</i>			<i>Decimals</i>		<i>Percentages</i>	
<i>Spring</i>	<i>Ratio and Proportion</i>		<i>Algebra</i>		<i>Statistics</i>	<i>Converting units</i>	<i>Area, Perimeter and volume</i>		<i>Shape</i>			<i>Position and direction</i>
<i>Summer</i>	<i>Revision</i>			<i>SATs</i>		<i>Consolidation and Maths Projects</i>						



		Autumn	Spring	Summer
<b>Year 6</b>	<b>Knowledge introduced</b>	<p><b><u>Place value within 10,000,000</u></b></p> <ul style="list-style-type: none"> <li>Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit.</li> <li>Round any whole number to a required degree of accuracy.</li> <li>Use negative numbers in context, and calculate intervals across zero.</li> <li>Solve number and practical problems that involve ordering and comparing numbers to 10 000 000, rounding to a required degree of accuracy, using negative numbers and calculating intervals across zero.</li> </ul> <p><b><u>Four operations</u></b></p> <ul style="list-style-type: none"> <li>Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.</li> <li>Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication.</li> <li>Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context.</li> <li>Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context.</li> </ul>	<p><b><u>Ratio and proportion</u></b></p> <ul style="list-style-type: none"> <li>Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.</li> <li>Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts.</li> <li>Solve problems involving similar shapes where the scale factor is known or can be found.</li> </ul> <p><b><u>Algebra</u></b></p> <ul style="list-style-type: none"> <li>Use simple formulae e.g. perimeter of a rectangle or area of a triangle.</li> <li>Generate and describe linear number sequences.</li> <li>Express missing number problems algebraically.</li> <li>Find pairs of numbers that satisfy an equation with two unknowns.</li> <li>Enumerate possibilities of combinations of two variables.</li> </ul> <p><b><u>Statistics</u></b></p> <ul style="list-style-type: none"> <li>Interpret and construct pie charts and line graphs and use these to solve problems.</li> <li>Calculate and interpret the mean as an average.</li> <li>Solve problems involving the calculation of percentages and the use of percentages for comparison.</li> </ul>	<p><b><u>Problem Solving</u></b></p> <ul style="list-style-type: none"> <li>Solve number and practical problems that involve all aspects of the previous learning.</li> <li>Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.</li> <li>Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.</li> <li>Solve problems involving addition, subtraction, multiplication and division.</li> <li>Use their knowledge of the order of operations to carry out calculations involving the four operations.</li> <li>Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.</li> <li>Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.</li> <li>Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts.</li> <li>Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit and vice versa, using decimal notation to up to three decimal places.</li> </ul>

- Identify common factors, common multiples and prime numbers.
- Recognise and use square numbers and cube numbers, and thenotations. (Y5)
- Use their knowledge of the order of operations to carry out calculationsinvolving the four operations.
- Perform mental calculations, includingwith mixed operationsand large numbers.
- Solve problems involvingaddition, subtraction, multiplication and division.

**Fractions**

- Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.
- Compare and order fractions, including fractions  $> 1$
- Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.
- Multiply proper fractionsand mixed numbers by whole numbers, supported by materials and diagrams.
- Multiply simple pairs of proper fractions, writing the answer in its simplestform e.g.  $1/4 \times 1/2 = 1/8$ .
- Divide proper fractionsby whole numbers e.g.  $1/3 \div 2 = 1/6$
- Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.
- Multiply simple pairs of proper fractions, writing the answer in its simplestform e.g.  $1/4 \times 1/2 = 1/8$ .
- Multiply proper fractionsand mixed numbers by whole numbers.

**Measure – imperial and metric measures**

- Solve problems involvingthe calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate.
- Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places.
- Convert between milesand kilometres.

**Measure – perimeter, area and volume**

- Recognise that shapes with the same areas can have different perimeters and vice versa.

**Geometry – properties of shapes**

- Draw 2-D shapes using given dimensions and angles.
- Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons.
- Recognise, describe and build simple 3-D shapes, including making nets.
- Identify 3D shapes including cubes and other cuboids, from 2D representations.
- Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius.
- Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.
- Recognise when it is possible to use formulae for area and volume of shapes.

- Describe positions on the full coordinate grid (all four quadrants).
- Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.
- Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons.

	<ul style="list-style-type: none"> <li>• Multiply simple pairs of proper fractions, writing the answer in its simplest form e.g. <math>\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}</math>.</li> <li>• Use written division methods in cases where the answer has up to two decimal places.</li> <li>• Use their knowledge of the order of operations to carry out calculations involving the four operations.</li> <li>• Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.</li> <li>• Compare and order fractions, including fractions <math>&gt; 1</math></li> </ul> <p><b><u>Decimals</u></b></p> <ul style="list-style-type: none"> <li>• Identify the value of each digit given to three decimal places and multiply and divide numbers by 10, 100 and 1,000 giving answers up to three decimal places.</li> <li>• Associate a fraction with division and calculate decimal fraction equivalents e.g. know that 7 divided by 21 is the same as <math>\frac{7}{21}</math> and that this is equal to <math>\frac{1}{3}</math> and e.g. 0.375 is equivalent to <math>\frac{3}{8}</math>.</li> <li>• Use written division methods in cases where the answer has up to two decimal places.</li> <li>• Multiply one-digit numbers with up to two decimal places by whole numbers.</li> </ul> <p><b><u>Percentages</u></b></p> <ul style="list-style-type: none"> <li>• Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.</li> <li>• Solve problems involving the calculation of percentages and the use of percentages for comparison.</li> </ul>	<ul style="list-style-type: none"> <li>• Calculate the area of parallelograms and triangles.</li> <li>• Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (<math>\text{cm}^3</math>) and cubic metres (<math>\text{m}^3</math>), and extending to other units e.g. <math>\text{mm}^3</math> and <math>\text{km}^3</math>.</li> </ul> <p><b><u>Geometry – position and direction</u></b></p> <ul style="list-style-type: none"> <li>• Describe positions on the full coordinate grid (all four quadrants).</li> <li>• Draw and translate simple shapes on the coordinate plane, and reflect them in the axes.</li> </ul>	
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		<ul style="list-style-type: none"> <li>• Multiply simple pairs of proper fractions, writing the answer in its simplest form e.g. <math>\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}</math>.</li> <li>• Compare and order fractions, including fractions <math>&gt; 1</math>.</li> <li>• Solve problems which require answers to be rounded to specified degrees of accuracy.</li> </ul>		
	<b>Knowledge revisited</b>	All teaching embeds and builds upon prior learning from EYFS to Year 5.		

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