# Maths at Horbury Primary Academy

Progression of Learning Document

Place Partnership
A MULTI-ACADEMY TRUST

## Our Vision

At Horbury Primary Academy, we believe that every child can be successful in mathematics. We aim to develop confident, fluent and resilient mathematicians who understand mathematical concepts deeply, communicate their thinking effectively and apply their learning independently.

Our curriculum is built upon the belief that mathematical success comes from secure understanding, consistent practice and regular opportunities to revisit and apply learning. For this reason, mathematics is taught through a carefully sequenced approach that begins in EYFS and continues consistently throughout Key Stage 1 and Key Stage 2.

By maintaining a consistent approach to mathematics teaching across the school, we support pupils in making connections between concepts, developing long-term retention and building confidence as mathematicians.

## Mathematics in EYFS

In Nursery and Reception, mathematics is taught through Number Phonics, a programme that develops strong number sense and a deep understanding of early mathematical concepts.

Number Phonics is built around four stages of learning:

**See**
Children observe mathematical concepts through practical experiences, visual representations and teacher modelling.

**Say**
Children develop mathematical language by discussing, explaining and describing what they notice.

**Do**
Children apply their learning through practical exploration and guided practice.

**Imagine**
Children make connections, solve problems and apply their understanding in different contexts.

Through this approach, children develop:
Number sense
Counting fluency
Subitising skills
Number composition
Mathematical vocabulary
Confidence in explaining their thinking
Early reasoning skills
A Seamless Journey into Key Stage 1 and Key Stage 2

As pupils move through school, the principles established through Number Phonics continue through our whole-school mathematics lesson structure:

| Number Phonics | The Horbury Way |
|---|---|
| See | I Do |
| Say | I Do / We Do |
| Do | We Do |
| Imagine | You Do |

This means that children do not experience a completely new way of learning mathematics when they enter Year 1. Instead, the learning structures and habits developed in EYFS continue and evolve.

**See → I Do**
Teachers explicitly model new learning, demonstrating methods, strategies and mathematical thinking.
Children observe expert examples and are shown what success looks like.

**Say → I Do / We Do**
Mathematical discussion is used to deepen understanding. Pupils explain their thinking, discuss strategies and develop mathematical vocabulary.

**Do → We Do**
Pupils practise new concepts with support from the teacher and their peers, building confidence and fluency through carefully structured activities.

**Imagine → You Do**
Pupils apply their learning independently through fluency tasks, problem solving and reasoning opportunities, making connections across different areas of mathematics. By maintaining this consistent approach from Nursery through to Year 6, we support successful transition, reduce cognitive load and allow pupils to focus on developing mathematical understanding.

## The Horbury Mathematics Lesson

Whilst content varies across year groups, lessons follow a consistent structure.

### The Horbury Five

Every mathematics lesson begins with the Horbury Five, a carefully selected retrieval activity designed to revisit previously taught arithmetic knowledge and skills.

We believe that pupils are more likely to retain learning when they regularly retrieve information from memory. Rather than viewing mathematics as a series of isolated units, the Horbury Five helps pupils reconnect with prior learning and recognise mathematics as an interconnected subject.

Questions are selected to revisit learning from recent lessons, previous units and, where appropriate, previous year groups. This continual revisiting strengthens retention and promotes fluency.

The Horbury Five helps pupils to:

- Recall key facts and procedures with increasing automaticity.
- Strengthen long-term retention of mathematical knowledge.
- Develop fluency and efficiency in calculation.
- Make connections between different areas of mathematics.
- Build confidence through regular success.
- Identify and address misconceptions before they become barriers to future learning.

By embedding daily retrieval practice, we ensure that important mathematical knowledge remains secure and readily available when pupils encounter new learning.

**Vocabulary**

We recognise that pupils cannot fully understand mathematics if they do not understand the language used to communicate it.

Mathematical vocabulary is explicitly taught, modelled and revisited within every lesson. Teachers introduce key terminology, provide opportunities for discussion and encourage pupils to communicate using precise mathematical language.

This begins in EYFS through the Say element of Number Phonics, where children develop confidence discussing numbers, patterns and mathematical relationships.

As pupils progress through school, mathematical language becomes increasingly sophisticated, enabling them to explain methods, justify answers and communicate reasoning with confidence.

A strong focus on vocabulary helps pupils to:

- Develop deeper conceptual understanding.
- Explain and justify their thinking.
- Access mathematical reasoning.
- Engage in purposeful mathematical discussion.
- Apply learning across different contexts.

We believe that if pupils can talk confidently about mathematics, they are more likely to understand it deeply.

**I Do: Explicit Modelling**

The I Do phase provides pupils with a clear model of successful mathematical thinking.
Teachers explicitly teach new concepts by demonstrating methods, modelling strategies and making mathematical thinking visible. Learning is carefully broken down into manageable steps so that pupils can focus on understanding new concepts before attempting them independently.

This stage directly reflects the 'See' element of Number Phonics. Just as children in EYFS begin by observing mathematical structures and representations, pupils throughout school continue to learn through expert modelling.

During this phase, teachers:

- Introduce new concepts clearly.
- Demonstrate efficient methods.
- Model mathematical thinking.
- Use carefully selected representations.
- Draw attention to important mathematical structures.
- Address common misconceptions.

We believe that high-quality modelling reduces cognitive load and allows pupils to focus their attention on the key mathematical concepts being taught. As a result, pupils develop a secure understanding of new learning before moving on to guided practice.

**We Do: Guided Practice**

The We Do phase provides pupils with opportunities to practise new learning alongside the teacher and their peers. This stage acts as a bridge between teacher modelling and independent application. It allows pupils to rehearse newly taught concepts, refine understanding and gain confidence before working independently. This phase reflects both the 'Say and Do' elements of Number Phonics, where discussion and supported practice are central to learning.

During guided practice, pupils:

- Discuss mathematical ideas.
- Explain their thinking.
- Respond to questions.
- Compare methods and strategies.
- Practise new skills with support.
- Receive immediate feedback.

We believe that guided practice is essential because it enables misconceptions to be identified and addressed before they become embedded. Through purposeful questioning and discussion, teachers can assess understanding in real time and adjust support accordingly. By the end of this stage, pupils should feel ready to apply their understanding independently.

**You Do: Independent Application**

The You Do phase provides pupils with opportunities to apply learning independently. This stage reflects the Imagine element of Number Phonics, where children begin to make connections, think flexibly and apply learning in different contexts. Independent practice allows pupils to demonstrate understanding through fluency, reasoning and problem-solving activities. It also provides teachers with valuable information about how securely pupils have understood the learning.

During this phase, pupils are encouraged to:

- Apply newly learned concepts.
- Select appropriate strategies.
- Work independently.
- Explain and justify solutions.
- Solve increasingly complex problems.
- Make connections between different mathematical ideas.

We believe that independent application should move beyond simple repetition and instead encourage pupils to think deeply about mathematics. As pupils progress through school, opportunities for reasoning and problem solving become increasingly sophisticated, enabling them to become confident and independent mathematicians.

**Fluency: Securing Mathematical Understanding**

Following guided and independent lesson practice, pupils complete fluency activities that are carefully designed to strengthen and secure the learning from the lesson. We believe that pupils need repeated opportunities to apply newly taught concepts in order to develop confidence, accuracy and efficiency. Fluency tasks provide opportunities for pupils to rehearse skills, recognise patterns and embed understanding before moving on to deeper reasoning and problem solving. Fluency is not viewed simply as speed or completing large numbers of calculations. Instead, we define fluency as a pupil's ability to apply mathematical knowledge accurately, efficiently and with growing confidence.

During fluency activities, pupils are encouraged to:

- Consolidate newly taught learning.
- Apply methods accurately.
- Develop efficiency in calculation.
- Make connections between concepts.

- Build confidence through successful practice.
- Identify and address misconceptions.

This stage allows pupils to secure the core learning of the lesson before progressing to reasoning and problem-solving tasks through Whizz Kids. By ensuring understanding is embedded first, pupils are better prepared to explain their thinking, justify their methods and tackle more complex mathematical challenges. Fluency therefore acts as the bridge between learning a concept and applying it in increasingly sophisticated ways.

**Whizz Kids: Developing Mathematical Thinkers**

At Horbury Primary Academy, every mathematics lesson includes a Whizz Kids task. We believe that reasoning and problem solving should not be reserved for a small group of pupils or taught as a separate element of the curriculum. Instead, all pupils should have regular opportunities to think mathematically, explain their ideas and apply their understanding. Whizz Kids provides this opportunity.

Each lesson, pupils engage with reasoning and problem-solving questions linked to their current learning. These questions encourage pupils to think beyond procedures and consider the mathematics behind their answers.
Through Whizz Kids, pupils are encouraged to:

- Explain their thinking.
- Justify their answers.
- Identify patterns and relationships.
- Spot mistakes and misconceptions.
- Compare different strategies.
- Apply learning in unfamiliar contexts.
- Communicate mathematically with confidence.

By ensuring every pupil accesses Whizz Kids, we provide consistent exposure to reasoning and problem solving across all year groups. This helps pupils develop confidence in tackling mathematical challenges and supports a deeper understanding of the concepts they are learning. Rather than viewing reasoning and problem solving as an additional element of mathematics, we consider it an essential part of becoming a successful mathematician.

**Challenge: Stretching Mathematical Thinking**

At Horbury Primary Academy, challenge is available for all pupils. We believe challenge should not simply involve larger numbers, more questions or moving children onto new content before they are ready. Instead, challenge comes through deeper thinking and increasingly sophisticated application of mathematical understanding. Once pupils have demonstrated secure understanding of the core learning, they are encouraged to apply their knowledge in more abstract ways.
Challenge opportunities may require pupils to:

- Generalise mathematical ideas.
- Prove or disprove statements.
- Make connections between concepts.
- Explain why methods work.
- Apply learning in unfamiliar situations.
- Work with increasing levels of abstraction.
- Develop more efficient strategies.

This approach ensures that pupils deepen their understanding of the mathematics being taught rather than accelerating prematurely through the curriculum. By focusing on depth and abstract application, pupils develop greater mathematical flexibility, resilience and independence.

## Assessment for Learning

Assessment for Learning is embedded throughout every mathematics lesson and is used to identify understanding, address misconceptions and inform future teaching.

Teachers continually assess pupils through:

- Engagement protocols.
- Targeted questioning.
- Mini whiteboard work.
- Guided practice.
- Discussion and mathematical dialogue.
- Live marking and immediate feedback.

These strategies allow teachers to gather real-time information about pupils' understanding and respond quickly to emerging misconceptions. Teaching can then be adapted in the moment to ensure pupils develop secure mathematical understanding before moving on.
Where appropriate, pupils respond to teacher feedback using purple pen. These responses are not simply corrections to mistakes. Instead, they are carefully designed to demonstrate and deepen understanding of the mathematical concept being taught. Pupils may be asked to explain their reasoning, apply their knowledge in a different context, prove their answer, identify a pattern or solve a related problem.
This ensures that feedback becomes an extension of learning rather than an isolated correction activity. Through this process, pupils are encouraged to think more deeply about mathematics, strengthen conceptual understanding and take an active role in their learning.
We believe that assessment should be an integral part of teaching rather than a separate event. Through ongoing assessment, teachers can provide timely support, appropriate challenge and maintain high expectations for all pupils.

## Adaptive Teaching

At Horbury Primary Academy, we believe that all pupils should have access to the same ambitious mathematics curriculum. Our aim is not to reduce the challenge of learning but to adapt the support provided so that every child can successfully engage with and understand the mathematical concepts being taught. Adaptive teaching is responsive and driven by ongoing assessment. Teachers use their knowledge of pupils and lesson-by-lesson assessment for learning to provide the right level of support at the right time.

Adaptations may include:

- The use of Widgit symbols and visual supports to aid understanding and reduce barriers to learning.
- The use of concrete resources and manipulatives to expose mathematical structures and develop conceptual understanding.
- Additional teacher modelling and guided practice.
- Small-group teaching to address misconceptions or provide targeted support.
- Carefully selected representations and scaffolds.
- Adapted questioning to support, challenge and deepen thinking.
- Adapted tasks which are carefully designed to meet a pupil's bespoke curriculum whilst maintaining pace and engagement with the whole-class learning.
- Opportunities for pre-teaching, overlearning and retrieval where appropriate.

We believe that mathematical understanding develops when pupils can see, discuss, manipulate and apply concepts in a range of ways. Therefore, adaptations focus on providing multiple routes into the learning rather than simplifying the mathematics itself. This approach ensures that pupils develop confidence and independence whilst working towards the same learning objectives as their peers wherever possible.

High expectations remain at the heart of mathematics teaching at Horbury Primary Academy. Through effective adaptive teaching, pupils are supported to access core learning, participate in reasoning and problem-solving opportunities through Whizz Kids, and engage with deeper mathematical thinking through Challenge. This ensures that all pupils are given the opportunity to achieve success and develop as confident mathematicians.

# Mathematics – Key Stage One and Two

## Statutory Framework for EYFS

Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, 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.

## National Curriculum Years 1 and 2

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. Pupils should read and spell mathematical vocabulary, at a level t a level consistent with their increasing word reading and spelling knowledge at key stage 1.

## National Curriculum Years 3 and 4

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. Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

## National Curriculum Years 5 and 6

The principal focus of mathematics teaching in upper key stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and

ratio. At this stage, pupils should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them. By the end of year 6, pupils should be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages. Pupils should read, spell and pronounce mathematical vocabulary correctly.

| | | | PLACE VALUE | | | | | |
|---|---|---|---|---|---|---|---|---|
| | EYFS (Non - statutory) | EYFS (ELG) | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Place Value: Counting** | **(3-4 yr olds)**<br><br>Develop fast recognition of up to 3 objects, without having to count them individually ('subitising').<br><br>Recite numbers past 5. | **Have a deep understanding of number to 10, including the composition of each number;**<br><br>**Subitise (recognise quantities without** | *count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number<br>**1NPV - 1**<br>*count numbers to 100 in numerals; count in multiples of twos, fives and tens | *count in steps of 2, 3 and 5 from 0, and in tens from any numbers, forward and backward | *count from 0 in multiples of 4,8,50 and 100; find 10 or 100 more or less than a given number | *count in multiples of 6, 7, 9, 25 and 1000<br>*count backwards through zero to include negative numbers | *count forward or backwards in steps of powers of 10 for any given number up to 1,000,000<br>*count forwards and backwards with positive and negative whole numbers, including through zero | |

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| **Place Value: Represent** | Say one number for each item in order: 1,2,3,4,5. Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle').<br><br>Show 'finger numbers' up to 5. Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5.<br><br>Experiment with their own symbols and marks as well as numerals. | **counting) up to 5;**<br><br>**Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.**<br><br>**Verbally count beyond 20, recognising the pattern of the counting system;** | *identify and represent numbers using objects and pictorial representations<br>*read and write number to 100 in numerals<br>*read and write numbers from 1 to 20 in numerals and words | *read and write numbers to at least 100 in numerals and in words<br>*identify, represent and estimate numbers using different representations including the number line | *identify, represent and estimate numbers using different representations<br>*read and write numbers up to 1,000 in numerals and in words | *identify, represent and estimate numbers using different representations<br>*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 | *read, write (order and compare) numbers to at least 1,000,000 and determine the value of each digit<br>**5NPV - 2**<br>*read roman numerals to 1000 (M) and recognise years written in Roman Numerals | *read, write (order and compare) numbers to at least 10,000,000 and determine the value of each digit<br>**6NPV - 2** |
| **Place Value: Use PV and Compare** | | | *given a number, identify one more and one less | *recognise the place value of each digit in a 2d number (tens, ones)<br>**2NPV - 1**<br>*compare and order numbers from 0 up to 100; use < > = signs<br>**2NPV - 2** | *recognise the place value of each digit in a 3d number (hundreds, tens, ones)<br>**3NPV - 2**<br>*compare and order numbers up to 1,000<br>**3NPV - 3** | *find 1,000 more or less than a given number<br>*recognise the place value of each digit in a 4d number (thousands, hundreds, tens, ones)<br>**4NPV - 2**<br>*order and compare numbers beyond 1,000<br>**4NPV - 3** | *(read, write) order and compare numbers to at least 1,000,000 and determine the value of each digit<br>**5NPV - 2** | *(read, write) order and compare numbers to at least 10,000,000 and determine the value of each digit<br>**6NPV - 2** |

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| **Place Value: Problems & Rounding** | Solve real world mathematical problems with numbers up to 5.<br><br>Compare quantities using language: 'more than', 'fewer than'.<br><br>**4-5 yr olds**<br>Count objects, actions and sounds.<br><br>Subitise<br><br>Link the number symbol (numeral) with its cardinal number value.<br><br>Count beyond ten.<br><br>Compare numbers.<br><br>Understand the 'one more than/one less than' relationship between consecutive numbers.<br><br>Explore the composition of numbers to 10.<br><br>Automatically recall number bonds for numbers 0–10. | **Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity;**<br><br>**Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.** | | *use place value and number facts to solve problems | *solve number problems and practical problems involving those ideas | *round any number to the nearest 10, 100 or 1,000<br>**4NPV - 3**<br>*solve number problems and practical problems that involve all of the above and with increasingly large positive numbers | *interpret negative numbers in context<br>*round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000<br>**5NPV - 3**<br>*solve number problems and practical problems that involve all of the above | *round any whole number to a required degree of accuracy<br>**6NPV - 3**<br>*use negative numbers in context, and calculate intervals across zero<br>*solve number problems and practical problems that involve all of the above |

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| | ADDITION & SUBTRACTION | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | EYFS (Non-Statutory) | EYFS (ELG) | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **+ and – Recall, Represent, Use** | | | *read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs **1AS - 2** *represent and use number bonds and related subtraction facts within 20 **1AS – 1** | *recall and use addition and subtractions facts to 20 fluently, and derive and use related facts up to 100 **2AS-1** *show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot | *estimate the answer to a calculation and use inverse operations to check answer | *estimate and use inverse operations to check answers to calculations | *use rounding to check answers to calculations and determine, in the context of the problem, levels of accuracy | |

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| **+ and – Calcuations** | | | *add and subtract 1d and 2d numbers to 20, including zero | *add and subtract numbers using concreate objects, pictorial representations, and mentally, including:<br>-a 2d number and ones<br>-a 2d number and tens<br>-two 2d numbers<br>-adding 3 1d numbers<br>**2AS - 3**<br>**2AS - 4** | *add and subtract numbers mentally, including:<br>-a 3d number and ones<br>-a 3d number and tens<br>-a 3d number and hundreds<br>*add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction<br>**3AS-2** | *add and subtract numbers with up to 4 digits, using formal written methods of columnar addition and subtraction where appropriate | *add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)<br>*add and subtract numbers mentally with increasingly large numbers | *perform mental calculations, including with mixed operations and large numbers<br>*use their knowledge o the order of operations to carry out calculations involving the four operations |
| **+ and – Solve Problems** | | | *solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = Δ - 9 | *solve problems with addition and subtraction:<br>-using concreate objects and pictorial presentations Including those involving numbers, quantities and measures<br>-applying their increasing knowledge of mental and written methods | *solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction | *solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why | *solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why<br>*solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign | *solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why |

| | MULTIPLICATION & DIVISION | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | EYFS (Non-Statutory) | EYFS (ELGs) | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **x and ÷ Recall, Represent, Use** | | | | *recall and use multiplication and division facts for the 2,5 and 10 multiplication tables, including recognising odd and even numbers **2MD - 1** *show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot | *recall and use multiplication and division facts for the 3,4 and 8 multiplication tables **3NF - 2** | *recall and use multiplication and division facts up to 12 x 12 Use place value, known and derived facts to multiply and divide mentally, including; multiplying by 0 and 1; dividing by 1; multiplying three numbers **4NF - 1** *recognise and use factor pairs and commutativity in mental calculations | *identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers **5MD - 2** *know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers *establish whether a number up to 100 is prime and recall prime numbers up to 19 *recognise and use square numbers and cube numbers, and the notation for squared ($^2$) and cubed ($^3$) | *identify common factors, common multiples and prime numbers *use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy |

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| **x and ÷ Calculations** | | | | *calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (x), division (÷) and equals (=) signs | *write and calculate mathematical statements for multiplication and division using the multiplication tables that the, including for 2d numbers times 1d numbers, using mental and progressing to formal written methods | *multiply 2d numbers and 3d numbers by a 1d number using formal written layout | *multiply numbers up to 4d by a 1d or 2d number using formal written method, including long multiplication for 2d numbers **5MD - 3** *multiply and divide numbers mentally drawing upon known facts *divide numbers up to 4d by a 1d number using the formal written method of short division and interpret remainders appropriately for the context **5MD - 4** *multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000 **5MD - 1** | *multiply multi-digit numbers up to 4d by 2d whole numbers using the formal written method of long multiplication *divide numbers up to 4d by 2d whole numbers using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context *divide numbers up to 4d by a 2d number using the formal written method of short division where appropriate, interpreting remainders according to the context *perform mental calculations, including with mixed operations and large numbers |

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| **x and ÷ Solve Problems** | | *solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher | | *solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts | *solve problems involving missing numbers, number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which **n** objects are connected to **m** objects | *solve problems involving multiplying and adding, including using the distributive law to multiply 2d numbers by 1d, integer scaling problems and order correspondence problems such as **n** objects are connected to **m** objects | *Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes<br>*solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates | *solve problems involving addition, subtractions, multiplication and division |
| **x and ÷ Combined operations** | | | | | | | *solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meanings of the equals sign | *use their knowledge of the order of operations to carry out calculations involving four operations |

# FRACTIONS, DECIMALS AND PERCENTAGES

| | EYFS (Non-Statutory) | EYFS (ELGs) | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|---|---|---|---|---|---|---|---|---|
| **Fractions: Recognise and write** | | | *recognise, find and name a half as one of two equal parts of an object, shape or quantity<br>*recognise, find and name a quarter as one of four equal parts of an object, shape or quantity | *recognise, find, name and write fractions $\frac{1}{3}, \frac{1}{4}, \frac{2}{4} and \frac{3}{4}$ of a length, shapes, set of objects or quantity | * count up and down in tenths; recognise that tenths arise form dividing an object into 10 equal parts and in dividing 1d numbers or quantities by 10<br>*recognise, find and write fractions of a discrete set of objects; unit fractions and non-unit fractions with small denominators<br>**3F - 2**<br>*recognise and use fractions as numbers; unit fractions and non-unit fractions with small denominators | * count up and down in hundredths; recognise that hundredths arise form dividing an object by 100 and dividing tenths by 10 | *identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths<br>*recognise mixed numbers and improper fractions and convert from one form to another and write mathematical statements > 1 as a mixed number e.g. $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$ | |
| **Fractions: Compare** | | | | *recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$ | *recognise and show, using diagrams, equivalent fractions with small denominators<br>*compare and order unit fractions and fractions with the same denominator | *recognise and show, using diagrams, families of common equivalent fractions | *compare and order fractions whose denominators are all multiples of the same number | *use common factors to simplify fractions, use common multiples to express fractions in the same denomination<br>**6F - 1**<br>*compare and order fractions including fractions >1<br>**6F - 2** |

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| **Fractions: Calculations** | | | | *write simple fractions e.g. $\frac{1}{2}$ of 6 = 3 | *add and subtract fractions with the same denominator within one whole e.g. $\frac{5}{7}+\frac{1}{7}=6/7$ **3F - 4** | *add and subtract fractions with the same denominator **4F - 3** | *add and subtract fractions with the same denominator and denominators that are multiples of the same number *multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams | *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 simplest form e.g. $\frac{1}{4}x\frac{1}{2}=\frac{1}{8}$ *divide proper fractions by whole numbers e.g. $\frac{1}{3}\div 2=\frac{1}{6}$ |
| **Fractions: Solve Problems** | | | | | *solve problems that involve all of the above | *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 | | |
| **Decimals: Recognise and Write** | | | | | | *recognise and write decimal equivalents of any number of tenths or hundredths *recognise and write decimal equivalents to $\frac{1}{4},\frac{1}{2},\frac{3}{4}$ | *read and write decimal numbers as fractions e.g. $0.71=\frac{71}{100}$ **5F - 3** *recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents | *identify the value of each digit in numbers given to 3dps |

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| **Decimals:Compare** | | | | | | *round decimals with 1dp to the nearest whole number<br>*compare numbers with the same number of decimal places up to 2dps | *round decimal numbers with 2dps to the nearest whole number and to 1dp<br>*read, write, order and compare numbers with up to 3dps | |
| **Decimals: Calculation & Problems** | | | | | | *find the effect of dividing a 1d or 2d numbers by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths | *solve problems involving numbers up to 3dps | *multiply and divide numbers by 10, 100 and 1,000 giving answers up to 3dps<br>*multiply 1d numbers with up to 2dps by whole numbers<br>*solve problems which require answers to be rounded to specified degrees of accuracy |

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| **Fractions, Decimals & Percentages** | | | | | | *solve simple measures and money problems involving fractions and decimals to 2dps | *recognise the per cent symbol (%) and understand that per cent relates to the 'number of parts per hundred' and write percentages as a s fraction with denominator 100 and as a decimal<br>*solve problems which require knowing percentage of decimal equivalents of $\frac{1}{2}, \frac{1}{4}, \frac{1}{5}, \frac{2}{5}, \frac{4}{5}$<br>And those fractions with a denominator of a multiple of 10 or 25 | *associate a fraction with division and calculate decimal fraction equivalents e.g. 0.375 for a simple fraction e.g. $\frac{3}{8}$<br>*recall and use equivalences between simple fractions, decimals and percentages including in different contexts |

| | | | RATIO AND PROPORTION | | | | | |
|---|---|---|---|---|---|---|---|---|
| | EYFS (Non-Statutory) | EYFS (ELGs) | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Ratio and Proportion** | | | | | | | | *solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts<br>**6AS/MD – 3**<br>**6AS / MD - 4**<br>*solve problems involving the calculation of percentages e.g. of measures and such as 15% of 360 and the use of percentages for comparison<br>*solve problems involving similar shapes where the scale factor is known or can be found<br>*solve problems involving unequal sharing and grouping using knowledge of fractions and multiples |

| | ALGEBRA | | | | | | | |
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| | EYFS (Non-statutory) | EYFS (ELG) | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Algebra** | | | *solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = Δ - 9 | *recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems | *solve problems including missing number problems | | | *use simple formulae<br>*generate and describe linear number sequences<br>*express missing number problems algebraically<br>*find pairs of numbers that satisfy an equation with two unknowns<br>*enumerate possibilities of combinations of two variables |

*although algebraic notation is not introduced until Y6, algebraic thinking starts much earlier as exemplified by the 'missing number' objectives from Y1,2,3

# MEASUREMENT

| | EYFS (Non-statutory) | EYFS (ELG) | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|---|---|---|---|---|---|---|---|---|
| **Measurement: Using Measures** | **3-4 yr olds**<br>Make comparisons between objects relating to size, length, weight and capacity<br><br>**4-5 yr olds**<br>Compare length, weight and capacity. | | *compare, describe and solve practical problems for:<br>-**lengths and heights** e.g. long/short, longer/shorter tall/short double/half<br>-**mass and weight** e.g. heavy/light heavier than/lighter than<br>-**capacity and volume** e.g. full/empty more than/less than half, half full, quarter full<br>-**time** e.g. quicker, slower, earlier, later<br>*measure and begin to record the following:<br>-lengths and heights<br>-mass/weight<br>-capacity and volume<br>-time (hours, minutes and seconds) | *choose and use appropriate standard units to estimate and measure:<br>-length/height in any direction (m/cm)<br>-mass (kg/g)<br>-temperature (°C)<br>-capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels<br>*compare and order lengths, mass, volume/capacity and record the results using < > and = | *measure, compare, add and subtract:<br>-lengths (m/cm/mm)<br>-mass (kg/g)<br>-volume/capacity (l/ml) | *convert between different units of measure e.g. kilometre to metre; hour to minute<br>*estimate, compare and calculate different measures | *convert between different units of metric measure e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre<br>**5NPV - 5**<br>*understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints<br>*use all four operations to solve problems involving measure e.g. length, mass, volume, money using decimal notation including scaling | *solve problems involving calculation and conversions of units of measure suing decimal notation up to 3dps where appropriate<br>*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 up to 3dps<br>*Convert between miles and kilometres |

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| **Measurement: Money** | | | *recognise and know the value of different denominations of coins and notes | *recognise and use the symbols for pounds (£) and pence (p); combine amounts to make a particular amount<br>*find different combinations of coins that equal the same amounts of money<br>*solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change | *add and subtract amounts of money to give change, using both £ and p in practical contexts | *estimate, compare and calculate different measures, including money in pounds and pence | *use all four operations to solve problems involving measure e.g. money | |

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| **Measurement: Time** | **3-4 yr olds**<br>Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then…' | | *sequence events in chronological order using language e.g. before and after, next, first, today, tomorrow, morning, afternoon, evening<br>*recognise and use language relating to dates, including days of the week, weeks, months and years<br>*tell the time to the hour and half past the hour and draw hands on a clock face to show these times | *compare and sequence intervals of time<br>*tell and write the time to five minutes, including quarter past/to the hour and draw hands on a clock face to show these times<br>*know the number of minutes in an hour and the number of hours in a day | *tell and write the time from an analogue clock, including using Roman numerals from I to XII and 12-hour and 24-hour clocks<br>*estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes ad hours; use vocabulary such as o'clock, am/pm, morning, afternoon, noon and midnight<br>*know the number of seconds in a minute and the number of days in each month, year and leap year<br>*compare durations of events e.g. to calculate the time taken by particular events or tasks | *read, write and covert time between analogue and digital 12- and 24-hour clocks<br>*solve problems involving converting from hours and minutes; minutes to seconds; years to months; weeks to days | *solve problems involving converting between units of time | *use, read, convert between standard units, converting measurements of time from smaller unit of measure to a larger unit of measure and vice versa |

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| **Measurement: Perimeter, Area and Volume** | | | | | *measure the perimeter of simple 2d shapes | *measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres<br>**4G - 2**<br>*find the area of rectilinear shapes by counting squares | *measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres<br>*calculate and compare the area of rectangles (including squares) and including using standard units, square centimetres ($cm^2$) and square metres ($m^2$) and estimate the area of irregular shapes<br>**5G - 2**<br>*estimate volume e.g. using 1$cm^3$ blocks to build cuboids (including cubes) and capacity e.g. using water | *recognise that shapes with the same area can have different perimeters and vice versa<br>*recognise when it is possible to use formulae for area and volume of shapes<br>*calculate the area of parallelograms and triangles<br>*calculate, estimate and compare volume of cubes and cuboids, using standard units including cubic centimetres ($cm^3$) and cubic metres ($m^3$) and extending to other units e.g. $mm^3$ and $km^3$ |

| | GEOMETRY | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | EYFS (Non-statutory) | EYFS (ELG) | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Geometry: 2D Shapes** | **3-4 yr olds**<br>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'.<br><br>Select shapes appropriately: flat surfaces for building, a | | *recognise and name common 2D shapes e.g. rectangles including squares, circles and triangles<br>**1G - 1** | *identify and describe properties of 2D shapes including number of side and line of symmetry in a vertical line<br>*identify 2D shapes on the surface of 3D shapes e.g. a circle on a cylinder and a triangle on a pyramid<br>*compare and sort common 2D shapes and everyday objects<br>**2G - 1** | *draw 2D shapes<br>**3G - 1** | *compare and classify geometric shapes including quadrilaterals and triangles based on their properties and sizes<br>**4G - 2**<br>*identify lines of symmetry in 2D shapes presented in different orientations<br>**4G - 3** | *Distinguish between regular and irregular polygons based on reasoning about equal sides and angles<br>*use the properties of rectangles to deduce related facts and find missing lengths and angles | *draw 2D shapes using given dimensions and angles<br>**6G - 1**<br>*compare and classify geometric shapes based on their properties and sizes<br>*illustrate and name parts of a circle including radius, diameter, circumference and know that the diameter it twice the radius |

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| **Geometry: 3D Shapes** | triangular prism for a roof etc.<br><br>Combine shapes to make new ones - an arch, a bigger triangle etc.<br><br>Talk about and identify the patterns around them. For example: stripes on clothes, designs on rugs and wallpaper. Use informal language like 'pointy', 'spotty', 'blobs' etc.<br><br>Extend and create ABAB patterns – stick, leaf, stick, leaf.<br><br>Notice and correct an error in a repeating pattern.<br><br>**4-5 yr olds**<br>Select, rotate and manipulate shapes in order to develop spatial reasoning skills.<br><br>Compose and decompose shapes so that children recognise a shape can have other shapes | | *recognise and name common 3D shapes e.g. cuboid including cubes, pyramids and spheres<br>**1G - 1** | *recognise and name common 3D shapes e.g. cuboids including cubes, pyramids and spheres<br>*compare and sort common 3D shapes and everyday objects<br>**2G - 1** | *make 3D shapes using modelling materials; recognise 3D shapes in different orientations and describe them | | *identify 3D shapes including cubes and other cuboids from 2D representations | *recognise and build simple 3D shapes including making nets |

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| | within it, just as numbers can.<br><br>Continue, copy and create repeating patterns. | | | | | | | |
| **Geometry: Angles & Lines** | | | | | *recognise angles as a property of shape or description of a turn<br>*identify right angles, recognise that two right angles make half-turn, three make three-quarter turns of a turn and four a complete turn; identify whether angles are greater than or less than a right angle<br>**3G - 1**<br>*identify horizontal and vertical lines and pairs of perpendicular and parallel lines | *identify acute and obtuse angles and compare and order angles up to two right angles by size<br>*identify lines of symmetry in 2D shapes presented in different orientations<br>**4G - 3**<br>*complete a simple symmetric figure with respect to a specific line of symmetry<br>**4G - 3** | *know angles are measured in degrees; estimate and compare acute, obtuse and reflex angles<br>**5G - 1**<br>*draw given angles and measure them in degrees<br>*identify:<br>-angles at a point and one whole turn (360°)<br>-angles at a point on a straight line and $\frac{1}{2}$ a turn (180°)<br>-other multiples of 90° | *find unknown angles in any triangles and quadrilaterals and regular polygons<br>*recognise angles where they meet at a point, are on a straight line or are vertically opposite and find missing angles |

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| **Geometry: Position and Direction** | **3-4 yr olds**<br>Understand position through words alone – for example, "The bag is under the table," – with no pointing.<br><br>Describe a familiar route.<br><br>Discuss routes and locations, using words like 'in front of' and 'behind | | *describe position, direction and movement including whole, half, quarter and three-quarter turns | *order and arrange combinations of mathematical objects in patterns and sequences<br>*use mathematical vocabulary to describe position, direction and movement including movement in a straight line ad distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise) | | *describe positions on a 2D grid as coordinates in the first quadrant<br>**4G-1**<br>*describe movements between positions as translations of a given unit to the left/right ad up/down<br>**4G - 1**<br>*plot specified points and draw sides to complete a given polygon | *identify, describe and represent the position of a shape following a reflection or translation using appropriate language and know the shape has not changed | *describe positions on the full coordinate grid (all four quadrants)<br>*draw and translate simple shapes on the coordinate plane and reflect them in the axes |

| | STATISTICS | | | | | | | |
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| | EYFS (Non-statutory) | EYFS (ELG) | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Statistics: Present & Interpret** | | | | *interpret and construct simple pictograms, tally charts, block diagrams and simple tables | *interpret and present data using bar charts, pictograms and tables | *Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs | *complete, read and interpret information in tables, including timetables | *interpret and construct pie charts and line graphs and use these to solve problems |
| **Statistics: Solve Problems** | | | | *ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity<br>*ask and answer questions about totalling and comparing categorical data | *solve one-step and two-step questions e.g. How many more? How many fewer?<br>using information presented in scaled bar charts and pictograms and tables | *solve comparisons, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs | *solve comparison, sum and difference problems using information presented in a line graph | *calculate and interpret the mean as an average |