



Maths at Hurst Green

“Living, loving and learning with God”

National Curriculum 2014 – Statutory Coverage

Purpose of study

Mathematics is a creative and highly interconnected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.

Aims

The national curriculum for mathematics aims to ensure that all pupils:

- 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
- can 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

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 broadly 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 be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

Spoken language

The national curriculum for mathematics reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their mathematical vocabulary and presenting a mathematical justification, argument or proof. They must be assisted in making their thinking clear to themselves as well as others, and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.

Attainment targets

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study

Subject Content

EYFS

To be added in sept

Key stage 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 4 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 consistent with their increasing word reading and spelling knowledge at key stage 1.

Key skills

Number: Number and Place Value

* 2 year olds

*3 and 4 year olds

Nursery	Reception	Year 1	Year 2
Counting numbers Take part in finger rhymes with numbers. React to changes of amount in a group of up to three items.	Count objects, actions and sounds. Subitise.	Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number	
Count in everyday contexts, sometimes skipping numbers – ‘1-2-3-5’	Count beyond ten	count, read and write 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 number, forward or backward
Recite numbers past 5. 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’). 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.			
Comparing numbers			
Compare amounts, saying ‘lots’, ‘more’ or ‘same’.	Compare numbers.	use the language of: equal to, more than, less than (fewer), most, least	compare and order numbers from 0 up to 100; use and = signs

Develop counting-like behaviour, such as making sounds, pointing or saying some numbers in sequence.			
Identifying, representing and estimating numbers			
Develop fast recognition of up to 3 objects, without having to count them individually ('subitising'). Link the number symbol (numeral) with its cardinal number value.	Link the number symbol (numeral) with its cardinal number value.	identify and represent numbers using objects and pictorial representations including the number line	identify, represent and estimate numbers using different representations, including the number line
Reading and writing numbers (including Roman Numerals)			
Experiment with their own symbols and marks as well as numerals.		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
Understanding place value			
			recognise the place value of each digit in a two digit number (tens, ones)
Problem solving			
Begin to identify own mathematical problems based on own interests and fascinations. Solve real world mathematical problems with numbers up to 5			use place value and number facts to solve problems
Greater Depth			
		Count reliably well beyond 100. Count on and back in 3's from any given number to beyond 100. Say the number that is ten more or ten less than a number to 100. Know the signs < and >.	Reason with numbers showing an understanding of place value.
Key Vocabulary			

	Zero, number, one, two, three....to twenty and beyond, count, count on, count back, is the same as, more, less, pattern, digit, the same number as, more, larger, bigger, greater, fewer, smaller, less, fewest, smallest, least, most, biggest, largest, greatest, one more, one less, compare, order, size, first, second, third...twentieth, last, before, after, next, between. Guess, estimate, nearly, close, about the same as, just over, just under, too many, too few, enough, not enough.	Numerals, twenty one, twenty two...one hundred, forwards, backwards, equal to, equivalent to, most, least, many, multiple of, half way between, above, below, roughly.	Two hundred....one thousand, threes, fours, tally, sequence, continue, predict, rule, >greater than,
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Year 3	Year 4	Year 5	Year 6
Counting numbers			
	count backwards through zero to include negative numbers	interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero	use negative numbers in context, and calculate intervals across zero
count from 0 in multiples of 4, 8, 50 and 100;	count in multiples of 6, 7, 9, 25 and 1 000	count forwards or backwards in steps of powers of 10 for any given number up to 1000 000	
Find 10 or 100 more or less than a given number	find 1000 more or less than a given number		
Comparing Numbers			
compare and order numbers up to 1000	Order and compare numbers beyond a thousand	read, write, order and compare numbers to at least 1 000 000 and	read, write, order and compare numbers up to 10 000 000 and

	compare numbers with the same number of decimal places up to two decimal places	determine the value of each digit (appears also in Reading and Writing Numbers)	determine the value of each digit (appears also in Reading and Writing Numbers) compare numbers with the same number of decimal places up to two decimal places
Identifying, representing and estimating numbers			
identify, represent and estimate numbers using different representations	identify, represent and estimate numbers using different representations		
Reading and writing numbers (including Roman Numerals)			
read and write numbers up to 1000 in numerals and in words Tell and write the time in numerals, numbers and words	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 read Roman numerals to 1000 (M) and recognise years written in Roman numerals.	read, write, order and compare numbers up to 10 000 000 and determine the value of each digit (appears also in Understanding Place Value)
Understanding place value			
recognise the place value of each digit in a three-digit number (hundreds, tens, ones)	recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) 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 units, tenths and hundredths	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers) recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents	identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and read, write, order and compare numbers up to 10 000 000 and determine the value of each digit 1 000 where the answers are up to three decimal places
Rounding			

	round any number to the nearest 10, 100 or 1 000	round any number up to 1 000 000 to the nearest 10, 100, 1 000, 10 000 and 100 000	round any whole number to a required degree of accuracy
	round decimals with one decimal place to the nearest whole number	round decimals with two decimal places to the nearest whole number and to one decimal place	solve problems which require answers to be rounded to specified degrees of accuracy
Problem solving			
solve number problems and practical problems involving these ideas	solve number and practical problems that involve all of the above and with increasingly large positive numbers	solve number problems and practical problems that involve all of the above	solve number problems and practical problems that involve all of the above
Greater Depth			
Recognise the value of each digit in a four-digit number and the value of a tenth. Begin to have an understanding about negative numbers, recognising they are smaller than 0.	Round any number to 100, 000 to the nearest 10, 100, 1000 or 10, 000. Use tenths, hundredths and thousands when comparing values.	Have a concept of numbers well beyond 1, 000, 000 and their relative association to distances to planets, historical data and geographical aspects. Use rounding as a strategy for quickly assessing what approximate answers ought to be, before calculating. Link working across 0 for positive and negative numbers to work time between BC and AD in history	Use the symbols =, ≠, ≤, ≥ correctly
Key Vocabulary			
Count in fours, eighths, fifties....hundreds, factor of, relationship, roman numerals, one hundred more, one hundred less, approximate, approximately, round, nearest, round to the nearest ten/hundred, round up, round down.	Ten thousand, hundred thousand, million, count in sixes, sevens, nines, twenty five, next, consecutive, integer, positive, negative, above/below zero, minus, negative numbers, one thousand more, one thousand less, thousand.	Factor pair, greater than or equal to, less than or equal to, formula, divisibility, square number, prime number, ascending/ descending order, ten thousand.	Factorise, prime factor, digit total.

Key skills

Number: Addition and Subtraction

Nursery	Reception	Year 1	Year 2
Number bonds			
	Automatically recall number bonds for numbers 0–5 and some to 10.	represent and use number bonds and related subtraction facts within 20	recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
Mental calculation			
	Understand the ‘one more than/one less than’ relationship between consecutive numbers.	add and subtract one-digit and two-digit numbers to 20, including zero read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Written Methods)	*add and subtract numbers using concrete objects, pictorial representations, and mentally, including: * a two-digit number and ones * a two-digit number and tens * two two-digit numbers adding three one-digit numbers show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot
Written Methods			
		read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Mental Calculation)	

Inverse operations, estimating and checking answers			
			recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems
Problem solving			
	Explore the composition of numbers to 10.	solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = * - 9$	solve problems with addition and subtraction: *using concrete objects and pictorial representations, including those involving numbers, quantities and measures *applying their increasing knowledge of mental and written methods solve simple problems in a practical context involving addition and subtraction of money of the same unit, including given change
Greater Depth			
		Apply knowledge of number to solve a one-step problem involving addition and subtraction. Add and subtract one digit and two digit numbers to 50, including 0.	Use reasoning about numbers and relationships to solve more complex problems and explain their thinking. Solve unfamiliar word problems that involve more than one step.
Key Vocabulary			
	Add, more, and, make, sum, total, altogether, double, one more... take away, one less, difference between..	Addition, near double, half, halve, subtract, equals, is the same as, number bonds/ pairs, missing number.	Ten more, ten less, facts.

Year 3	Year 4	Year 5	Year 6
Mental Calculation			
add and subtract numbers mentally, including: * a three-digit number and ones * a three-digit number and tens * a three-digit number and hundreds		add and subtract numbers mentally with increasingly large numbers	perform mental calculations, including with mixed operations and large numbers
Written Methods			
add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction	add and subtract numbers with up to 4 digits using the 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)	
Inverse operations, estimating and checking answers			
estimate the answer to a calculation and use inverse operations to check answers	estimate and use inverse operations to check answers to a calculation	use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy	use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.
Problem solving			
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 multistep problems in contexts, deciding which operations and methods to use and why	solve addition and subtraction multistep problems in contexts, deciding which operations and methods to use and why Solve problems involving addition, subtraction, multiplication and division
Greater Depth			
Add and subtract numbers with any number of digits using formal written methods.	Use tenths, hundreds and thousandths when solving addition and subtraction problems. Solve	Calculate number problems algebraically for example $2x-3=5$.	

	multi-step problems involving more than one of the operations.		
Key Vocabulary			
Tens boundary, hundreds boundary, complex, operations.	Inverse	Units boundary, tenths boundary.	

Key skills

Number: Multiplication and Division

Nursery	Reception	Year 1	Year 2
Multiplication and division facts			
		count in multiples of twos, fives and tens (copied from Number and Place Value)	count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward (copied from Number and Place Value) recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
Mental Calculation			
			show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot
Written Calculation			
			calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals (=) signs
Problem Solving			
	Solve problems, including doubling, halving and sharing.	solve one-step problems involving multiplication and division, by calculating the answer using	solve problems involving multiplication and division, using materials, arrays, repeated addition,

		concrete objects, pictorial representations and arrays with the support of the teacher	mental methods, and multiplication and division facts, including problems in contexts
Greater Depth			
		Apply knowledge of number to solve a one step problem involving simple multiplication and division..	Recall and use multiplication and division facts for 2, 5 and 10, and make deductions outside known multiplication facts. Solve unfamiliar word problems that involve more than one step.
Key Vocabulary			
	Sharing, doubling, halving, number patterns	Multiplication, multiply, multiplied by, multiple, division, dividing, grouping, array.	Groups of, times, once, twice, three times...ten times, repeated addition, divide, divided by, divided into, share, share equally, left over, one each, two each...group in pairs, threes...equal groups of, row, column, multiplication table, fact.

Year 3	Year 4	Year 5	Year 6
Multiplication and division facts			
count from 0 in multiples of 4, 8, 50 and 100 (copied from Number and Place Value) recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables	count in multiples of 6, 7, 9, 25 and 1 000 (copied from Number and Place Value) recall multiplication and division facts for multiplication tables up to 12×12	count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 (copied from Number and Place Value)	

Mental Calculation			
<p>write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods (appears also in Written Methods)</p>	<p>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 recognise and use factor pairs and commutativity in mental calculations (appears also in Properties of Numbers)</p>	<p>multiply and divide numbers mentally drawing upon known facts</p> <p>multiply and divide whole numbers and those involving decimals by 10, 100 and 1000</p>	<p>perform mental calculations, including with mixed operations and large numbers associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$) (copied from Fractions)</p>
Written Calculation			
<p>write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods (appears also in Mental Methods)</p>	<p>multiply two-digit and three-digit numbers by a one-digit number using formal written layout</p>	<p>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</p> <p>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</p>	<p>multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication</p> <p>divide numbers up to 4-digits by a two-digit whole number using the formal written method of short division where appropriate for the context 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</p>

			use written division methods in cases where the answer has up to two decimal places
Properties of numbers: Multiples, factors, primes, square and cube numbers			
	recognise and use factor pairs and commutativity in mental calculations (repeated)	<p>identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers. identify common factors, common multiples and prime numbers know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers use common factors to simplify fractions; use common multiples to express fractions in the same denomination establish whether a number up to 100 is (copied from Fractions) 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)</p>	<p>identify common factors, common multiples and prime numbers use common factors to simplify fractions; use common multiples to express fractions in the same denomination calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm³) and cubic metres (m³), and extending to other units such as mm³ and km³</p>
Order of operations			
			use their knowledge of the order of operations to carry out calculations involving the four operations BODMAS/BIDMAS

Inverse operations, estimating and checking answers			
estimate the answer to a calculation and use inverse operations to check answers (copied from Addition and Subtraction)	estimate and use inverse operations to check answers to a calculation (copied from Addition and Subtraction)		use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy
Problem Solving			
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	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	solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates	solve problems involving addition, subtraction, multiplication and division solve problems involving similar shapes where the scale factor is known or can be found (copied from Ratio and Proportion)
Greater Depth			
Know all multiplication facts up to 12x12 and be able to instantaneously answer questions such as how many 7's in 42. Multiply and divide any two digit number by a single digit number and have an understanding of remainder	Solve multi-step problems involving more than one of the operations. Rapidly recall answer when multiplying and dividing a whole or decimal number by 10.	Divide whole numbers (up to 4 digits) by 2 digit numbers using preferred method. Recognise the symbol for square root and work out square roots for numbers up to 100.	Multiply all integers (using efficient written methods) including mixed numbers and negative numbers. Move beyond squared and cubed numbers to calculate problems such as $X \times 10^n$ where n is positive
Key Vocabulary			
Factor, product, remainder.	Inverse, square, squared, cube, cubed.		

Key skills

Number: Fractions (including decimals and percentages)

Nursery	Reception	Year 1	Year 2
Counting in fractional steps			
			Pupils should count in fractions up to 10, starting from any number and using the $\frac{1}{2}$ and $\frac{2}{4}$ equivalence on the number line (Non Statutory Guidance)
Recognising fractions			
		recognise, find and name a half as one of two equal parts of an object, shape or quantity recognise, find and name a quarter as one of four equal parts of an object, shape or quantity	recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity
Equivalence (including fractions, decimals and percentages)			
			write simple fractions e.g. $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$.
Greater Depth			Find and compare fractions of amounts.

Key Vocabulary			
	Parts of a whole, half, quarter.	Fraction, equal part, equal grouping, equal sharing, one of two equal parts, one of four equal parts.	Equivalent fraction, numerator, denominator, two halves, two quarters, three quarters, one third, two thirds, one of three equal parts

Year 3	Year 4	Year 5	Year 6
Counting in fractional steps			
count up and down in tenths	count up and down in hundredths		
Recognising fractions			
<p>recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators</p> <p>recognise that tenths arise from dividing an object into 10 equal parts and in dividing one – digit numbers or quantities by 10.</p> <p>recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators</p>	recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten	recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents (appears also in Equivalence)	
Comparing fractions			
compare and order unit fractions, and fractions with the same denominators		compare and order fractions whose denominators are all multiples of the same number	compare and order fractions, including fractions >1

Comparing decimals			
		read, write, order and compare numbers with up to three decimal places	identify the value of each digit in numbers given to three decimal places
Rounding including decimals			
		round decimals with two decimal places to the nearest whole number and to one decimal place	solve problems which require answers to be rounded to specified degrees of accuracy
Equivalence (including fractions, decimals and percentages)			
		<p>identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths</p> <p>read and write decimal numbers as fractions (e.g. $0.71 = 71 / 100$)</p> <p>recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents</p> <p>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 as a decimal fraction</p>	<p>use common factors to simplify fractions; use common multiples to express fractions in the same denomination</p> <p>associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $3 / 8$)</p> <p>recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.</p>
Addition and Subtraction of fractions			
add and subtract fractions with the same denominator within one whole (e.g. $5 / 7 + 1 / 7 = 6 / 7$)		add and subtract fractions with the same denominator and multiples of the same number	add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions

		recognise mixed numbers and from one form to the other and write mathematical statements > 1 as a mixed number (e.g. $2 \frac{2}{5} + 4 \frac{4}{5} = 6 \frac{6}{5}$ / improper fractions and convert	
Multiplication and division of fractions			
		multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams	multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$) multiply one-digit numbers with up to two decimal places by whole numbers divide proper fractions by whole numbers (e.g. $\frac{1}{3} \div 2 = \frac{1}{6}$)
Multiplication and division of decimals			
			multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$) use written division methods in

			cases where the answer has up to two decimal places
Problem Solving			
solve problems that involve all of the above		<p>solve problems involving numbers up to three decimal places</p> <p>solve problems which require knowing percentage and decimal equivalents of $1/2$, $1/4$, $1/5$, $2/5$, $4/5$ and those with a denominator of a multiple of 10 or 25</p>	
Greater Depth			
Can find fractional values (from $1/2$ to $1/10$) of amounts up to 1000			Compare, order and convert between fractions, decimals and percentages in contexts
Key Vocabulary			
. Sixths, sevenths, eighths, tenths	.	Proper/improper fraction, equivalent, reduced to, cancel, thousandths, in every, for every, percentage, per cent.	Ratio.

Key skills

Ratio and Proportion2

Statements only appear in Year 6 but should be connected to previous learning, particularly fractions and multiplication and division

Year 3	Year 4	Year 5	Year 6
			solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.
			solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison
			solve problems involving similar shapes where the scale factor is known or can be found.
Greater Depth			Reason with numbers showing an understanding of ratio and proportion.

Key Vocabulary			
.			Integer, percentages, scale factor, unequal grouping.

Key skills

Measurement

Nursery	Reception	Year 1	Year 2
Comparing and estimating			
<p>Compare sizes, weights etc. using gesture and language - 'bigger/little/smaller', 'high/low', 'tall', 'heavy'.</p>	<p>Compare length, weight and capacity.</p>	<p>compare, describe and solve practical problems for: * lengths and heights [e.g. long/short, longer/shorter, tall/short, double/half] * mass/weight [e.g. heavy/light, heavier than, lighter than] * capacity and volume [e.g. full/empty, more than, less than, half, half full, quarter] time [e.g. quicker, slower, earlier, later]</p> <p>Sequence events in chronological order using language [e.g. before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]</p>	<p>compare and order lengths, mass, volume/capacity and record the results using >, < and =</p> <p>compare and sequence intervals of time.</p>
Measuring and calculating			
<p>Make comparisons between objects relating to size, length, weight and capacity.</p>		<p>measure and begin to record the following: * lengths and heights * mass/weight * capacity and volume * time (hours, minutes, seconds) recognise and know the value of different denominations of coins and notes</p>	<p>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,</p>

			<p>scales, thermometers and measuring vessels.</p> <p>Everyday language to talk about: *money recognise and know the value of different denominations of coins and notes recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value 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.</p>
Telling the time			
		<p>tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.</p> <p>recognise and use language relating to dates, including days of the week, weeks, months and years</p>	<p>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.</p> <p>know the number of minutes in an hour and the number of hours in a day. (appears also in Converting)</p>
Converting			
			<p>know the number of minutes in an hour and the number of hours in a day. (appears also in Telling the Time)</p>

Greater Depth			
		<p>Recognise all coins and notes, and know their value. Use coins to pay for items bought up to £1. Use knowledge of time to know when key periods of the day happen, for example, lunchtime, home time etc.</p>	<p>Read scales where not all numbers on the scale are given, and estimate points in between. Read the time on a clock to the nearest 5 minutes</p>
Key Vocabulary			
	<p>Measure, size, compare, guess, estimate, enough, too much, too little, too many, too few, nearly, close to, about the same as. Length, height, long, short, tall, wide, narrow, thick, thin, longer, shorter, taller... longest, shortest, tallest, highest... Weigh, weighs, balances, heavy, light, heavier than, lighter than, scales, non-standard units.</p> <p>Full empty, half full, holds, container. Time, days of the week, Monday, Tuesday....day, week, birthday, morning, afternoon, evening, night, bedtime, dinner time, playtime, today, yesterday, tomorrow, before, after, next, last, quick, quicker, quickest, quickly, slow, slower, slowest, slowly, old, new, hour, o'clock, watch, clock, hands. Money, coin, penny, pence, pound, price, cost, buy, sell, spend, spent, pay..</p>	<p>Measurement, roughly, centimetre, metre, standard units, wide, narrow, ruler, metre stick, kilogram, litre, capacity, volume, more than, less than, quarter full. Months of the year, January, February..., seasons, Autumn, Winter, Spring, Summer, weekend, month, year, earlier, later, first, midnight, date, always, never, often, sometimes, usually, once, twice, half past, clock face, hour hand, minute hand, hours, minutes.</p>	<p>Measuring scales, further, furthest, tape measure, gram, millimetre, temperature, degree, 5, 10, 15 minutes past/ to, fortnight, quarter past, digital, analogue, timer, seconds, bought, sold.</p>

Year 3	Year 4	Year 5	Year 6
Comparing and estimating			
<p>compare durations of events, for example to calculate the time taken by particular events or tasks estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight (appears also in Telling the Time)</p>	<p>estimate, compare and calculate different measures, including money in pounds and pence (also included in Measuring)</p>	<p>calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm²) and square metres (m²) and estimate the area of irregular shapes (also included in measuring)</p>	<p>calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm³) and cubic metres (m³), and extending to other units such as mm³ and km³. estimate volume (e.g. using 1 cm³ blocks to build cubes and cuboids) and capacity (e.g. using water)</p>
Measuring and calculating			
<p>Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) measure the perimeter of simple 2-D shapes</p> <p>add and subtract amounts of money to give change, using both £ and p in practical contexts</p>	<p>estimate, compare and calculate different measures, including money in pounds and pence (appears also in Comparing) measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres</p> <p>find the area of rectilinear shapes by counting squares</p>	<p>use all four operations to solve problems involving measure (e.g. length, mass, volume, money) using decimal notation including scaling. measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm²) and square metres (m²) and estimate the area of irregular shapes recognise and use square numbers and cube numbers, and the notation for</p>	<p>solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate (appears also in</p> <p>recognise that shapes with the same areas can have different perimeters and vice versa Converting)</p> <p>calculate the area of parallelograms and triangles calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic metres (m³), and</p>

		squared (2) and cubed (3) (copied from Multiplication and Division)	extending to other units [e.g. mm ³ and km ³]. recognise when it is possible to use formulae for area and volume of shapes
Telling the time			
tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks read, write and convert time between analogue and digital 12 and 24-hour clocks (appears also in Converting) estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock ; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight	solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days (appears also in Converting)	solve problems involving converting between units of time	
Converting			
now the number of seconds in a minute and the number of days in each month, year and leap year	convert between different units of measure (e.g. kilometre to metre; hour to minute)	solve problems involving converting between units of time convert between different units of metric measure (e.g. kilometre and metre;	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

	<p>read, write and convert time between analogue and digital 12 and 24-hour clocks (appears also in Converting)</p> <p>solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days (appears also in Telling the Time)</p>	<p>centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)</p> <p>understand and use equivalences between metric units and common imperial units such as inches, pounds and pints</p>	<p>versa, using decimal notation to up to three decimal places</p> <p>read, write and convert time between analogue and digital 12 and 24-hour clocks (appears also in Converting)</p> <p>solve problems involving converting between units of time solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate (appears also in Measuring and Calculating)</p>
Greater Depth			
<p>Use knowledge of number to solve problems related to money, time and measures. Can relate knowledge of time to problems related to timetables. Measure, compare, add and subtract more complex problems using common metric measures set out in kg, g, kl, l, m, km.</p>	<p>Use a 24 hour timetable to find out times for a journey between various places. Use knowledge of perimeter to work out the perimeter of large areas around school using metres and centimetres.</p>	<p>Use knowledge of measurement to create plans of areas around school, such as classroom, field, play area etc. Relate imperial measures still used regularly in our society to their metric equivalent, e.g. miles to kilometres, pounds to kilograms. Use a range of timetables to work out journey times on a fictional journey around the world, e.g. how long would it take to reach the rainforests in the Amazon.</p>	<p>Use formula for measuring the area of shape such as cuboid and triangle to work out the area of an irregular shape in the school environment. Use four operations with mass, length, time, money and other measures, including with decimal quantities. Calculate costs and time involved to visit a destination in another part of the world.</p>

Key Vocabulary			
Division, approximately, millimetre, kilometre, mile, distance apart, between, to, from, perimeter, centigrade, century, calendar, earliest, latest, a.m., p.m., roman numerals, 12 hour clock time, 24 hour clock time..	Unit, standard unit, metric unit, breadth, edge, area, covers, square centimetre, mass, measuring cylinder, leap year, millennium, date of birth, timetable, arrive, depart	imperial unit, square metre, square millimetre, pint, gallon, discount, currency.	Yard, foot, feet, inch, inches, circumference, tonne, pound, ounce, centilitre, cubic centimetres, cubic metres, cubic millimetres, cubic kilometres, Greenwich Mean Time, British Summer Time, International Date Line, profit, loss

Key skills

Geometry: Properties of Shape

Nursery	Reception	Year 1	Year 2
Identifying shapes and their properties			
<p>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'</p>	<p>Select, rotate and manipulate shapes to develop spatial reasoning skills.</p>	<p>recognise and name common 2-D and 3-D shapes, including: * 2-D shapes [e.g. rectangles (including squares), circles and triangles] * 3-D shapes [e.g. cuboids (including cubes), pyramids and spheres].</p>	<p>Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]</p>
Comparing and classifying			
<p>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</p>	<p>Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can.</p>		<p>compare and sort common 2-D and 3-D shapes and everyday objects</p>
Patterns			
<p>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. Extend and create ABAB patterns – stick, leaf, stick, leaf. Notice and</p>	<p>Continue, copy and create repeating patterns.</p>		

correct an error in a repeating pattern. Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then...'			
Greater Depth		Recognise and name a range of 2D and 3D shapes	Describe similarities and differences of 2D and 3D shapes using their properties.
Key Vocabulary			
.	shape, pattern, flat, curved, straight, round, solid, sort, make, build, draw, size, bigger, larger, smaller, symmetrical, pattern, repeating pattern, match, 2D shape, corner, side, rectangle, square, circle, triangle, 3D shape, face, edge, corner, cube, pyramid, sphere, cone.	Point, pointed, cuboid, cylinder.	surface, line symmetry, rectangular, circular, triangular, pentagon, hexagon, octagon.

Year 3	Year 4	Year 5	Year 6
Identifying shapes and their properties			
	Identify lines of symmetry in 2-D shapes presented in different orientations	Identify 3-D shapes, including cubes and other cuboids, from 2-D representations	recognise, describe and build simple 3-D shapes, including making nets (appears also in Drawing and Constructing) illustrate and name parts of circles, including radius, diameter and circumference and

			know that the diameter is twice the radius
Drawing and constructing			
draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them	complete a simple symmetric figure with respect to a specific line of symmetry	draw given angles, and measure them in degrees (°)	draw 2-D shapes using given dimensions and angles recognise, describe and build simple 3-D shapes, including making nets
Comparing and classifying			
	compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes	use the properties of rectangles to deduce related facts and find missing lengths and angles	compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons distinguish between regular and irregular polygons based on reasoning about equal sides and angles
Angles			
recognise angles as a property of shape or a description of a turn identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle	identify acute and obtuse angles and compare and order angles up to two right angles by size	know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles identify angles at a point and one whole turn (total 360 °) Identify angles at a point on a straight line and ½ a turn (total 180 °) Identify other multiples of 90 °	recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles

identify horizontal and vertical lines and pairs of perpendicular and parallel lines			
Greater Depth			
	Know that the total internal angles of a triangle measure 180o and can measure each.	Recognise nets and show an understanding that they create 3D shapes. Solve problems involving angles.	
Key Vocabulary			
Draw, perimeter, pentagonal, hexagonal, octagonal, quadrilateral, right angled, parallel, perpendicular, hemisphere, prism, triangular prism, orientations.	Line, construct, sketch, centre, angle, right angles, base, square based, reflect, reflection, regular, irregular, two dimensional, oblong, rectilinear, equilateral triangle, isosceles triangle, scalene triangle, heptagon, parallelogram, rhombus, trapezium, polygon, three dimensional, spherical, cylindrical, tetrahedron, polyhedron	Radius, diameter, congruent, axis of symmetry, reflective symmetry, x-axis, yaxis, quadrant, octahedron.	Circumference, concentric, arc, net, open, closed, intersecting, intersection, plane, kite, dodecahedron

Key Skills

Geometry: Position and Direction

Nursery	Reception	Year 1	Year 2
Position, direction and movement			
<p>Climb and squeeze themselves into different types of spaces. Describe children's climbing, tunnelling and hiding using spatial words like 'on top of', 'up', 'down' and 'through'.</p> <p>Understand position through words alone – for example, "The bag is under the table," – with no pointing. Describe a familiar route. Discuss routes and locations, using words like 'in front of' and 'behind'.</p>		<p>describe position, direction and movement, including half, quarter and three-quarter turns</p>	<p>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 anti-clockwise</p>
Pattern			
<p>Notice patterns and arrange things in patterns.</p>			<p>order and arrange combinations of mathematical objects in patterns and sequences</p>
Greater Depth			
		<p>Give instructions using positional and directional language.</p>	
Key Vocabulary			

	Position, over, under, above, below, top, bottom, on, in, outside, inside, around, in front of, behind, front, back, besides, next to, between, pattern, repeated pattern.	Position, over, under, above, below, top, bottom, on, in, outside, inside, around, in front of, behind, front, back, besides, next to, between, pattern, repeated pattern.	Route, higher, lower, clockwise, anticlockwise, right angle, straight line.
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Year 3	Year 4	Year 5	Year 6
Position, direction and movement			
recognise angles as a property of shape or a description of a turn recognise angles as a property of shape or a description of a turn	describe positions on a 2-D grid as coordinates in the first quadrant describe movements between positions as translations of a given unit to the left/right and up/down 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 the appropriate language, and know that the shape has not changed	describe positions on the full coordinate grid (all four quadrants draw and translate simple shapes on the coordinate plane, and reflect them in the axes.)
Greater Depth			
Key Vocabulary			
Compass point, north, south, east, west, N, S, E, W, horizontal, vertical, diagonal, angle, greater/smaller angle than..., acute angle, obtuse angle.	North east, north west, south east, south west, NE, NW, SE, SW, translate, translation, rotate, rotation, degree, reflection, ruler set square, angle measurer, compass.,	Coordinate, protractor.	Reflex angle

Key Skills Statistics

Nursery	Reception	Year 1	Year 2
Handling data			
			interpret and construct simple pictograms, tally charts, block diagrams and simple tables ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity ask and answer questions about totalling and comparing categorical data
Greater Depth			
Key Vocabulary			Count, tally, sort, vote, graph, block graph, pictogram, represent, group, set, list, table, label, title, most/least popular, most/least common.

Year 3	Year 4	Year 5	Year 6
Counting			
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
Solving Problems			
solve one-step and two-step questions [e.g. 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables.	solve comparison, 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
Greater Depth			
	Collect own data on a given project and present information in graphical formats of their choosing.	collect own data on a given project and present information in graphical formats of their choosing, charts, graphs and tables	Collect own data on a personal project and present information in formats of their choosing, charts, graphs and tables, and answer specific questions related to their research
Key Vocabulary			
Chart, bar chart, frequency table, Carroll diagram, Venn diagram, axis, axes, diagram.	Survey, questionnaire, data	Database, bar line chart, line graph, maximum/minimum value, outcome.	Pie chart, mean, mode, median, range, estimates, statistics, distribution.

Key Skills Algebra

Nursery	Reception	Year 1	Year 2
Equations		<p>solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = * - 9$ (copied from Addition and Subtraction)</p> <p>represent and use number bonds and related subtraction facts within 20 (copied from Addition and Subtraction)</p>	<p>recognise and use the inverse relationship between addition and subtraction and use this to check calculations and missing number problems. (copied from Addition and Subtraction)</p> <p>recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 (copied from Addition and Subtraction)</p>
Greater Depth			
Key Vocabulary		Number bonds, facts, addition, subtraction, missing number problems.	Inverse, check, fluently

Year 3	Year 4	Year 5	Year 6
Equations			
solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction. (copied from Addition and Subtraction)		use the properties of rectangles to deduce related facts and find missing lengths and angles (copied from Geometry: Properties of Shapes)	express missing number problems algebraically
Formulae			
	Perimeter can be expressed algebraically as $2(a + b)$ where a and b are the dimensions in the same unit. (Copied from NSG measurement)		use simple formulae recognise when it is possible to use formulae for area and volume of shapes (copied from Measurement)
Sequences			
			generate and describe linear number sequences
Greater Depth		Calculate number problems algebraically for example $2x-3=5$.	Recognise an arithmetic progression and find the nth term. Move beyond squared and cubed numbers to calculate problems such as $X \times 10n$ where n is positive.
Key Vocabulary			
missing number, complex, integer scaling, facts, complex...	Dimensions, perimeter, algebraic	Missing lengths, missing angles	Formulae, equation, unknown, variable.

