Statutory Curriculum Coverage (from National Curriculum)

Subject area: Mathematics: number and place value, addition and subtraction, multiplication and division, fractions, ratio and proportion, algebra, geometry, measurement

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	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Number and place value	▪ count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number ▪ count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens ▪ given a number, identify one more and one less ▪ identify and represent numbers using objects and pictorial representations including numberlines, and use the language of: equal to, more than, less than (fewer), most, least ▪ read and write numbers from 1 to 20 in numerals and words. ▪ recognise and create repeating patterns with objects and ▪ practise counting (1, 2, 3…), ordering (first, second, third…), and to indicate a quantity (3 apples, 2 centimetres), including solving simple concrete problems, until fluent ▪ begin to recognise place value in numbers beyond 20 by reading, writing, counting and comparing numbers up to 100, supported by objects and pictorial representations ▪ practise counting as reciting numbers and counting as	▪ count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward ▪ recognise the place value of each digit in a two-digit number (tens, ones) ▪ identify, represent and estimate numbers using different representation including the number line ▪ compare and order numbers from 0 up to 100; use <, > and = signs ▪ read and write numbers to at least 100 in numerals and in words ▪ use place value and number facts to solve problems. ▪ Practise counting, reading, writing and comparing numbers to at least 100 and solving a variety of related problems to develop fluency. ▪ Count in multiples of three to support later understanding of a third. ▪ represent larger numbers in different ways, including spatial representations ▪ partition numbers in different ways (Eg. 23= 20 + 3 and 23= 10 + 13) ▪ solve problems that emphasise the value of each digit in two-digit numbers. ▪ begin to understand zero as a place holder.	▪ count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number ▪ recognise the place value of each digit in a three-digit number (hundreds, tens, ones) ▪ compare and order numbers up to 1000 ▪ identify, represent and estimate numbers using different representation ▪ read and write numbers up to 1000 in numerals and in words ▪ solve number problems and practical problems involving these ideas. ▪ use multiples of 2, 3, 4, 5, 8, 10, 50 and 100 use larger numbers to at least 1000, applying partitioning related to place value using varied and increasingly complex problems, building on work in year 2 (for example, 146 = 100 + 40 and 6, 146 = 130 + 16). ▪ continue to count in ones, tens and hundreds, to become fluent in the order and place value of numbers to 1000.	▪ count in multiples of 6, 7, 9, 25 and 1000 ▪ find 1000 more or less than a given number ▪ count backwards through zero to include negative numbers ▪ recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) ▪ order and compare numbers beyond 1000 ▪ identify, represent and estimate numbers using different representation ▪ round any number to the nearest 10, 100 or 1000 ▪ solve number and practical problems that involve all of the above and with increasingly large positive numbers ▪ 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. ▪ become fluent in the order and place value of numbers beyond 1000, including counting in tens and hundreds, and maintaining fluency in other multiples through varied and frequent practice ▪ begin to extend knowledge of the number system to include the decimal numbers and fractions met	▪ read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit ▪ count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 ▪ interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero ▪ round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 ▪ solve number problems and practical problems that involve all of the above ▪ read Roman numerals to 1000 (M) and recognise years written in Roman numerals. ▪ identify the place value in large whole numbers ▪ continue to use number in context, including measurement, extend and apply understanding of the number system to the decimal numbers and fractions met so far ▪ recognise and describe linear number sequences, including those involving fractions and decimals, and find the term-to-term rule. ▪ recognise and describe linear number sequences	▪ read, write, order and compare numbers up to 10 000 000 and determine the value of each digit ▪ round any whole number to a required degree of accuracy ▪ use negative numbers in context, and calculate intervals across zero ▪ solve number and practical problems that involve all of the above ▪ use the whole number system, including saying, reading and writing numbers accurately.

	enumerating objects, and counting in twos, fives and tens from different multiples including varied and frequent practice through increasingly complex questions. ▪ use the terms **odd** and **even**			so far ▪ connect estimation and rounding numbers to the use of measuring instruments ▪ put Roman numerals in their historical context to understand that there have been different ways to write whole numbers and that the important concepts of zero and place value were introduced over a period of time	(for example, 3, 3 $\frac{1}{2}$, 4, 4 $\frac{1}{2}$...), including those involving fractions and decimals, and find the term-to-term rule in words (for example, add $\frac{1}{2}$)	
Addition and subtraction	▪ read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs ▪ represent and use number bonds and related subtraction facts within 20 ▪ add and subtract one-digit and two-digit numbers to 20, including zero ▪ solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ – 9. ▪ memorise and reason with number bonds to 10 and 20 in several forms (for example, 9 + 7 = 16; 16 – 7 = 9; 7 = 16 – 9). ▪ realise the effect of adding or subtracting zero to establish addition and subtraction as related operations. ▪ combine and increase numbers, counting forwards and backwards. ▪ discuss and solve problems in familiar practical contexts, including using quantities and include the terms: **put together, add, altogether, total, take away,**	▪ solve problems with addition and subtraction: ➢ using concrete objects and pictorial representations, including those involving numbers, quantities and measures ➢ applying increasing knowledge of mental and written methods ▪ recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 ▪ add and subtract numbers using concrete objects, pictorial representation and mentally, including: ➢ a two-digit number and ones; ➢ a two-digit number and tens; ➢ two two-digit numbers; ➢ adding three one-digit numbers ▪ solve problems with addition and subtraction using concrete objects and pictorial representation including those involving numbers, quantities and measures ▪ show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot ▪ recognise and use the inverse relationship between	▪ 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 with up to three digits, using formal written methods of columnar addition and subtraction ▪ estimate the answer to a calculation and use inverse operations to check answers ▪ solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction. ▪ practise solving varied addition and subtraction questions, for mental calculations with two-digit numbers, the answers could exceed 100. ▪ use understanding of place value and partitioning, and practise using columnar addition and subtraction with increasingly large numbers up to three digits to become fluent	▪ add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate ▪ estimate and use inverse operations to check answers to a calculation ▪ solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why. ▪ continue to **practise** both mental methods and columnar addition and subtraction with increasingly large numbers to aid fluency	▪ add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) ▪ add and subtract numbers mentally with increasingly large numbers ▪ use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy ▪ solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why ▪ practise using the formal written methods of columnar addition and subtraction with increasingly large numbers to aid fluency ▪ practise mental calculations with increasingly large numbers to aid fluency (for example, 12 462 – 2300 = 10 162).	▪ perform mental calculations, including with mixed operations and large ▪ use knowledge of the order of operations to carry out calculations involving the four operations ▪ solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why ▪ solve problems involving all four operations ▪ use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy ▪ practise addition and subtraction for larger numbers, using the formal written methods of columnar addition and subtraction ▪ undertake mental calculations with increasingly large numbers and more complex calculations ▪ round answers to a specified degree of accuracy, for example, to the nearest 10, 20, 50 etc., but not to a specified number of significant figures ▪ explore the order of operations using brackets; for example, 2 + 1 x 3 = 5 and (2 + 1) x 3 = 9

	distance between, difference between, more than and less than, to develop the concept of addition and subtraction and use these operations flexibly.	addition and subtraction and use this to check calculations and solve missing number problems. ▪ use the language of addition and subtraction to include **sum** and **difference**. ▪ practise addition and subtraction to 20 to become increasingly fluent in deriving facts such as using 3 + 7 = 10; 10 – 7 = 3 and 7 = 10 – 3 to calculate 30 + 70 = 100; 100 – 70 = 30 and 70 = 100 – 30. ▪ check calculations, including by adding to check subtraction and adding numbers in a different order to check addition (for example, 5 + 2 + 1 = 1 + 5 + 2 = 1 + 2 + 5) to establish commutativity and associativity of addition.				
Multiplication and division	▪ solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with support ▪ begin to understand: ➢ multiplication and division through grouping and sharing small quantities; ➢ doubling numbers and quantities; ➢ finding simple fractions of objects, numbers and quantities. ▪ make connections between arrays, number patterns, and counting in twos, fives and tens.	▪ recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers ▪ calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs ▪ show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot ▪ solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.	▪ recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables ▪ 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 ▪ 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. ▪ continue to practise mental recall of multiplication tables when calculating mathematical statements in order to improve fluency.	▪ recall multiplication and division facts for multiplication tables up to 12 × 12 ▪ 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 ▪ multiply two-digit and three-digit numbers by a one-digit number using formal written layout ▪ 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	▪ apply all the multiplication tables and related division facts frequently, commit them to memory and use confidently to make larger calculations ▪ recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3}) ▪ use and understand the terms: **factor; multiple; prime; square number ; cube number** and use them to construct equivalence statements (for example, 4 x 35 = 2 x 2 x 35; 3 x 270 = 3 x 3 x 9 x 10 = 9^2 x 10). ▪ identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers ▪ know and use the vocabulary of prime	▪ perform mental calculations, including with mixed operations and large ▪ use knowledge of the order of operations to carry out calculations involving the four operations ▪ multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication ▪ 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 ▪ divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context

		▪ use a variety of language to describe multiplication and division. ▪ begin to become familiar with multiplication tables and practise to become fluent in the 2, 5 and 10 x tables and connect them to each other. ▪ connect the 10 x table to place value, and the 5 x table to the divisions on the clock face. ▪ begin to use other multiplication tables and recall multiplication facts, including using related division facts to perform written and mental calculations. ▪ work with a range of materials and contexts in which multiplication and division relate to grouping and sharing discrete and continuous quantities, to arrays and to repeated addition. ▪ begin to relate these to fractions and measures (for example, 40 ÷ 2 = 20, 20 is a half of 40). They use commutativity and inverse relations to develop multiplicative reasoning (for example, 4 × 5 = 20 and 20 ÷ 5 = 4).	▪ connect the 2, 4 and 8 multiplication tables through doubling ▪ solve simple problems in contexts, deciding which of the four operations to use and why including measuring and scaling contexts, (Eg. four times as high, eight times as long etc.) and correspondence problems (in which m objects are connected to n objects Eg. 3 hats and 4 coats, how many different outfits?; 12 sweets shared equally between 4 children; 4 cakes shared equally between 8 children) ▪ develop reliable written methods for multiplication and division, starting with calculations of two-digit numbers by one-digit numbers and progressing to formal written methods of short multiplication and division.	▪ continue to practise recalling and using multiplication tables and related division facts to aid fluency ▪ practise mental methods and extend this to three-digit numbers to derive facts, (for example 600 ÷ 3 = 200 can be derived from 2 x 3 = 6) ▪ become fluent in the formal written method of short multiplication and short division with exact answers through practise ▪ write statements about the equality of expressions (for example, use the distributive law 39 × 7 = 30 × 7 + 9 × 7 and associative law (2 × 3) × 4 = 2 × (3 × 4)). ▪ combine knowledge of number facts and rules of arithmetic to solve mental and written calculations for example, 2 x 6 x 5 = 10 x 6 = 60 ▪ solve two-step problems in contexts, choosing the appropriate operation, working with increasingly harder numbers, solving correspondence questions such as the numbers of choices of a meal on a menu, or three cakes shared equally between 10 children	numbers, prime factors and composite (non-prime) numbers ▪ establish whether a number up to 100 is prime and recall prime numbers up to 19 ▪ 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 ▪ multiply and divide numbers mentally drawing upon known facts ▪ 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 ▪ multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 ▪ 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 ▪ interpret non-integer answers to division by expressing results in different ways according to the context, including with remainders, as fractions, as decimals or by rounding	▪ identify common factors, common multiples and prime numbers ▪ practise multiplication and division for larger numbers, using the formal written methods of short and long multiplication, and short and long division ▪ undertake mental calculations with increasingly large numbers and more complex calculations ▪ continue to use all the multiplication tables to calculate mathematical statements in order to maintain their fluency ▪ round answers to a specified degree of accuracy, for example, to the nearest 10, 20, 50 etc., but not to a specified number of significant figures ▪ use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy ▪ explore the order of operations using brackets; for example, 2 + 1 x 3 = 5 and (2 + 1) x 3 = 9 ▪ common factors are related to finding equivalent fractions ▪ solve problems involving multiplication and division

					(for example, $98 \div 4 = \frac{98}{4}$ $= 24 \text{ r } 2 = 24\frac{1}{2} = 24.5 \approx 25$) ▪ use multiplication and division as inverses to support the introduction of ratio in year 6, for example, by multiplying and dividing by powers of 10 in scale drawings or by multiplying and dividing by powers of a 1000 in converting between units such as km and m ▪ understand distributivity as being expressed as $a(b + c) = ab + ac$ ▪ Use and explain equals sign to indicate equivalence, including in missing number problems (Eg. 13+24 = 12+25; 33 = 5x)	
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 and find half of a length, quantity, set of objects or shape. ▪ connect halves and quarters to the equal sharing and grouping of sets of objects and to measures, as well as recognising and combining halves and quarters as parts of a whole.	▪ 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 ▪ write simple fractions for example, $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$ ▪ use fractions as 'fractions of' discrete and continuous quantities by solving problems using shapes, objects and quantities. ▪ connect unit fractions to equal sharing and grouping, to numbers when they can be calculated, and to measures, finding fractions of lengths, quantities, sets of objects or shapes, $\frac{3}{4}$ as the first example of a non-unit	▪ count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 ▪ connect tenths to place value, decimal measures and to division by 10 ▪ recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators ▪ begin to understand unit and non-unit fractions as numbers on the number line, and deduce relations between them, such as size and equivalence, going beyond the [0, 1] interval, and relate this to measure ▪ recognise and use fractions as numbers: unit fractions and non-unit fractions with small	▪ recognise and show, using diagrams, families of common equivalent fractions ▪ count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten. ▪ 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 ▪ add and subtract fractions with the same denominator ▪ recognise and write decimal equivalents of any number of tenths or hundredths ▪ relate decimal notation to division of whole number by 10 and later 100 ▪ recognise and write	▪ compare and order fractions whose denominators are all multiples of the same number ▪ identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths ▪ recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [Eg. $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$] ▪ 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 ▪ read and write decimal	▪ use common factors to simplify fractions and use common multiples to express fractions in the same denomination ▪ compare and order fractions, including fractions > 1 ▪ add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions ▪ multiply simple pairs of proper fractions, writing the answer in its simplest form [Eg. $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$] ▪ divide proper fractions by whole numbers [Eg. $\frac{1}{3} \div 2 = \frac{1}{6}$] ▪ associate a fraction with division and calculate decimal fraction equivalents [Eg. 0.375] for

		fraction. ▪ 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 (for example, $1\frac{1}{4}$, $1\frac{2}{4}$ (or $1\frac{1}{2}$), $1\frac{3}{4}$, 2) to reinforce the concept of fractions as numbers which can add up to more than one.	denominators ▪ recognise and show, using diagrams, equivalent fractions with small denominators ▪ add and subtract fractions with the same denominator within one whole [for example, $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$] ▪ compare and order unit fractions, and fractions with the same denominators ▪ solve problems involving all of the above. ▪ understand the relation between unit fractions as operators (fractions of), and division by integers. ▪ continue to recognise fractions in the context of parts of a whole, numbers, measurements, a shape, and unit fractions as a division of a quantity ▪ practise adding and subtracting fractions with the same denominator through a variety of increasingly complex problems to improve fluency.	decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ ▪ find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths ▪ round decimals with one decimal place to the nearest whole number ▪ compare numbers with the same number of decimal places up to two decimal places ▪ solve simple measure and money problems involving fractions and decimals to two decimal places ▪ connect hundredths to tenths and place value and decimal measure ▪ use number lines to connect fractions, numbers and measures ▪ understand the relation between non-unit fractions and multiplication and division of quantities, with particular emphasis on tenths and hundredths ▪ make connections between fractions of a length, of a shape and as a representation of one whole or set of quantities and use factors and multiples to recognise equivalent fractions and simplify where appropriate (for example, $\frac{6}{9} = \frac{2}{3}$ or $\frac{1}{4} = \frac{2}{8}$) ▪ continue to practise adding and subtracting fractions with the same denominator, to become fluent through a variety of	numbers as fractions [for example, $0.71 = \frac{71}{100}$] ▪ recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents ▪ round decimals with two decimal places to the nearest whole number and to one decimal place ▪ read, write, order and compare numbers with up to three decimal places ▪ solve problems involving number up to three decimal places ▪ recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal ▪ solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25 ▪ understand that percentages, decimals and fractions are different ways of expressing proportions ▪ extend knowledge of fractions to thousandths and connect to decimals and measures ▪ connect equivalent fractions > 1 that simplify to integers with division and other fractions > 1 to division with remainders, using the number line and other models, and hence move from these to improper and mixed	a simple fraction [Eg. $\frac{3}{8}$] ▪ identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places ▪ multiply one-digit numbers with up to two decimal places by whole numbers ▪ use written division methods in cases where the answer has up to two decimal places ▪ solve problems which require answers to be rounded to specified degrees of accuracy ▪ recall and use equivalences between simple fractions, decimals and percentages, including in different contexts ➢

				increasingly complex problems beyond one whole ▪ understand that decimals and fractions are different ways of expressing numbers and proportions ▪ practise counting using simple fractions and decimals, both forwards and backwards ▪ luse decimal notation and the language associated with it, including in the context of measurements ▪ make comparisons and order decimal amounts and quantities that are expressed to the same number of decimal places ▪ represent numbers with one or two decimal places in several ways, such as on number lines	fractions ▪ connect multiplication by a fraction to using fractions as operators (fractions of), and to division, building on work from previous years and relate to scaling by simple fractions, including fractions > 1 ▪ practise adding and subtracting fractions to become fluent through a variety of increasingly complex problems ▪ extend understanding of adding and subtracting fractions to calculations that exceed 1 as a mixed number ▪ continue to practise counting forwards and backwards in simple fractions ▪ continue to develop understanding of fractions as numbers, measures and operators by finding fractions of numbers and quantities ▪ extend counting from Year 4, using decimals and fractions including bridging zero ▪ say, read and write decimal fractions and related tenths, hundredths and thousandths accurately and become confident in checking the reasonableness of answers to problems ▪ mentally add and subtract tenths, and one-digit whole numbers and tenths ▪ practise adding and subtracting decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places, and complements of 1 (Eg. 0.83 + 0.17 = 1)	

					▪ solve puzzles involving decimals ▪ make connections between percentages, fractions and decimals (Eg. 100% represents a whole quantity and 1% is $\frac{1}{100}$, 50% is $\frac{50}{100}$, 25% is $\frac{25}{100}$) and relate this to finding 'fractions of'	
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 ▪ solve problems involving the calculation of percentages [Eg. measures, and 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 ▪ solve problems involving unequal sharing and grouping using knowledge of fractions and multiples ▪ recognise proportionality in contexts when the relations between quantities are in the same ratio (Eg. similar shapes and recipes) ▪ link percentages or 360° to calculating angles of pie charts ▪ consolidate understanding of ratio when comparing quantities, sizes and scale drawings by solving a variety of problems ▪ begin to use the notation *a*:*b* to record work ▪ solve problems involving unequal quantities Eg. 'for every egg you need three

						spoonfuls of flour', '$\frac{3}{5}$ of the class are boys' to lay foundations for later formal approaches to ratio and proportion
Algebra						▪ use simple formulae ▪ generate and describe linear number sequences ▪ express missing number problems algebraically ▪ find pairs of numbers that satisfy an equation with two unknowns ▪ enumerate possibilities of combinations of two variables ▪ begin to use symbols and letters to represent variables and unknowns in mathematical situations that they already understand, such as: ➢ missing numbers, lengths, coordinates and angles ➢ formulae in mathematics and science ➢ equivalent expressions (Eg. $a + b = b + a$) ➢ generalisations of number patterns ▪ number puzzles (Eg. what two numbers can add up to)

Field Code Changed

Measurement	▪ compare, describe and solve practical problems for: ➢ lengths and heights [Eg. long/short, longer/shorter, tall/short, double/half]; ➢ mass/weight [Eg. heavy/light, heavier than, lighter than]; ➢ capacity and volume [Eg. full/empty, more than, less than, half, half full, quarter]; ➢ time [Eg. quicker, slower, earlier, later] ▪ measure and begin to record: ➢ lengths and heights ➢ mass/weight ➢ capacity and volume ➢ time (hours, minutes, seconds) ▪ recognise and know the value of different denominations of coins and notes ▪ sequence events in chronological order using language [for example, **before, after, next, first, today, yesterday, tomorrow, morning, afternoon, evening**] ▪ recognise and use language relating to dates: **days of the week, weeks, months, years** ▪ tell the time to the hour and half past the hour and draw the hands on a clock face to show these times. ▪ move from using and comparing different types of quantities and measures using non-standard units, including discrete (Eg. counting) and continuous (Eg. liquid) measurement, to using manageable common standard units (cm, m, l, kg). ▪ begin to use measuring	▪ choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels ▪ compare and order lengths, mass, volume/capacity and record the results using >, < and = ▪ 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 ▪ compare and sequence intervals of time ▪ tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times ▪ know the number of minutes in an hour and the number of hours in a day. ▪ use standard units of measurement with increasing accuracy, using knowledge of the number system. ▪ use the appropriate language and record using standard abbreviations (l, ml, m, cm, kg, g, km). ▪ compare measures includes simple multiples such as 'half as high'; 'twice as wide'. ▪ become fluent in telling the	▪ measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) ▪ measure the perimeter of simple 2-D shapes ▪ add and subtract amounts of money to give change, using both £ and p in practical contexts ▪ tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks ▪ estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight ▪ know the number of seconds in a minute and the number of days in each month, year and leap year ▪ compare durations of events [Eg. calculate time taken by particular events or tasks] ▪ continue to measure using the appropriate tools and units, progressing to using a wider range of measures, including comparing and using mixed units (Eg. 1 kg and 200g) and simple equivalents of mixed units (Eg. 5m = 500cm) ▪ simple scaling by integers (Eg. a given quantity or measure is twice as long or five times as high) and connect to multiplication. ▪ continue to become fluent in recognising the value	▪ convert between different units of measure [Eg. km to m; ml to l; hour to minute] ▪ measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres ▪ find the area of rectilinear shapes by counting squares ▪ estimate, compare and calculate different measures, including money in pounds and pence ▪ read, write and convert time between analogue and digital 12- and 24-hour clocks ▪ solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days ▪ build on understanding of place value and decimal notation to record metric measures, including money ▪ use multiplication to convert from larger to smaller units ▪ express perimeter algebraically as $2(a + b)$ where a and b are the dimensions in the same unit ▪ relate area to arrays and multiplication	▪ convert between different units of metric measure (Eg. Km and m; cm and m; cm and mm; g and kg; l and ml) using knowledge of place value and multiplication and division ▪ understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints ▪ measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres including using the relations of perimeter or area to find unknown lengths ▪ 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 ▪ estimate volume [Eg. using 1 cm^3 blocks to build cuboids, including cubes] and capacity [Eg. using water] ▪ solve problems involving converting between units of time ▪ use all four operations to solve problems involving measure [Eg. length, mass, volume, money] using decimal notation, including scaling ▪ express missing measures questions algebraically, Eg. $4 + 2b = 20$ for a rectangle of sides 2 cm and b cm and perimeter of 20cm ▪ calculate the area from scale drawings using given measurements ▪ use all four operations in	▪ solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate ▪ use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places ▪ convert between miles and kilometres ▪ recognise that shapes with the same areas can have different perimeters and vice versa ▪ recognise when it is possible to use formulae for area and volume of shapes ▪ calculate the area of parallelograms and triangles ▪ 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 [Eg. mm^3 and km^3] ▪ connect conversion (Eg. from kilometres to miles) to a graphical representation as preparation for understanding linear/proportional graphs ▪ know approximate conversions and are able to tell if an answer is sensible ▪ use number lines to add and subtract positive and negative integers for measures such as temperature ▪ relate the area of rectangles to parallelograms and triangles, Eg. by dissection, and calculate their areas, understanding and using the formulae (in words or symbols) to do this

	tools such as a ruler, weighing scales and containers. ▪ use the language of time, including telling the time throughout the day, first using o'clock and then half past.	time on analogue clocks and recording it. ▪ become fluent in counting and recognising all coins ▪ read and say amounts of money confidently and use the symbols £ and p accurately, recording pounds and pence separately.	of coins, by adding and subtracting amounts, including mixed units, and giving change using manageable amounts. ▪ record £ and p separately (formal decimal recording introduced in Year 4) ▪ use both analogue and digital 12-hour clocks to record times.		problems involving time and money, including conversions (for example, days to weeks, expressing the answer as weeks and days)	▪ become familiar with compound units for speed, such as miles per hour, and apply this knowledge in science or other subjects as appropriate
Geometry – properties of shapes	▪ recognise and name common 2-D and 3-D shapes, including: ➢ 2-D shapes [rectangle, square, circle triangle] ➢ 3-D shapes [cuboid, cube, pyramid sphere]. ▪ handle common 2-D and 3-D shapes, naming these and related everyday objects fluently. ▪ recognise common 2-D and 3-D shapes in different orientations and sizes, and know that rectangles, triangles, cuboids and pyramids are not always similar to each other.	▪ handle and name a wide variety of common 2-D and 3-D shapes including: **quadrilaterals,polygons, cuboids, prisms, cones**, and identify the properties of each shape ▪ 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 ▪ compare and sort common 2-D and 3-D shapes and everyday objects ▪ identify, compare and sort shapes on the basis of their properties and use vocabulary precisely, such as sides, edges, vertices and faces ▪ draw lines and shapes using a straight edge ▪ read and write names for shapes that are appropriate for their word reading and spelling	▪ draw 2-D shapes and make 3-D shapes using modelling materials ▪ recognise 3-D shapes in different orientations and describe them ▪ 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 **horizontal and vertical lines** and pairs of **perpendicular and parallel lines** ▪ extend knowledge of the properties of shapes to symmetrical and non-symmetrical polygons and polyhedra ▪ extend their use of the properties of shapes to describe the properties of 2-D and 3-D shapes using accurate language, including lengths of lines and **acute** and **obtuse** for angles greater or lesser than a right angle. ▪ connect decimals and	▪ compare and classify geometric shapes, including quadrilaterals and triangles**,** based on their properties and sizes (Eg. **isosceles, equilateral, scalene, parallelogram, rhombus, trapezium**) ▪ identify acute and obtuse angles' compare and order angles up to two right angles by size and decide if a polygon is regular or irregular ▪ identify lines of symmetry in 2-D shapes presented in different orientations ▪ complete a simple symmetric figure with respect to a specific line of symmetry ▪ draw symmetric patterns using a variety of media to become familiar with different orientations of lines of symmetry; and recognise line symmetry in a variety of diagrams, including where the line of symmetry does not dissect the original shape	▪ identify 3-D shapes, including cubes and other cuboids, from 2-D representations ▪ know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles ▪ draw given angles, and measure them in degrees (^{o}) ▪ identify: ➢ angles at a point and one whole turn (total 360^{o}) ➢ angles at a point on a straight line and $\frac{1}{2}$ a turn (total 180^{o}) ➢ other multiples of 90^{o} ▪ use the properties of rectangles to deduce related facts and find missing lengths and angles ▪ distinguish between regular and irregular polygons based on reasoning about equal sides and angles ▪ become accurate in drawing lines with a ruler to the nearest millimetre, and measuring with a protractor and use conventional markings for	▪ draw 2-D shapes using given dimensions and angles ▪ recognise, describe and build simple 3-D shapes, including making nets ▪ compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons ▪ illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius ▪ recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles ▪ draw shapes and nets accurately, using measuring tools and conventional markings and labels for lines and angles ▪ describe the properties of shapes and explain how unknown angles and lengths can be derived from known measurements ▪ Begin to express relationships algebraically Eg. $d = 2 \times r$ and

			rounding to drawing and measuring straight lines in centimetres, in a variety of contexts.		parallel lines and right angles ▪ use the term **diagonal** and make conjectures about the angles formed between sides, and between diagonals and parallel sides, and other properties of quadrilaterals, Eg. using dynamic geometry ICT tools ▪ use angle sum facts and other properties to make deductions about missing angles and relate these to missing number problems	$a = 180 - (b + c)$
Geometry – position and direction	▪ describe position, direction and movement, including whole, half, quarter and three-quarter turns. ▪ use the terms: **left, right, top, middle and bottom, on top of, in front of, above, between, around, near, close,far, up, down, forwards backwards, inside, outside.** ▪ make whole, half, quarter and three-quarter turns in both directions and connect turning clockwise with movement on a clock face.	▪ order and arrange combinations of mathematical objects in patterns and sequences ▪ use mathematical vocabulary to describe position, direction and movement, including: ➢ movement in a straight line ➢ distinguishing between rotation as a turn ➢ right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise). ▪ work with patterns of shapes, including those in different orientations. ▪ use the concept and language of angles to describe 'turn' by applying rotations, including in practical contexts (for example, themselves moving in turns, giving instructions to others, using robots)		▪ 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 ▪ draw a pair of axes in one quadrant, with equal scales and integer labels ▪ read, write and use pairs of coordinates, for example (2, 5), including using coordinate-plotting ICT tools	▪ 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 ▪ recognise and use reflection and translation in a variety of diagrams, including continuing to use a 2-D grid and coordinates in the first quadrant and reflection should be in lines that are parallel to the axes	▪ describe positions on the full coordinate grid (all four quadrants) ▪ draw and label a pair of axes in all four quadrants with equal scaling. This extends their knowledge of one quadrant to all four quadrants, including the use of negative numbers ▪ draw and label rectangles (including squares), parallelograms and rhombuses, specified by coordinates in the four quadrants, predicting missing coordinates using the properties of shapes ▪ draw and translate simple shapes on the coordinate plane, and reflect them in the axes ▪ begin to express translations algebraically Eg. translating vertex (a, b) to $(a - 2, b + 3)$; (a, b) and $(a + d, b + d)$ being opposite vertices of a square of side d

Statistics		▪ 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 ▪ record, interpret, collate, organise and compare information (for example, using many-to-one correspondence in pictograms with simple ratios 2, 5, 10)	▪ interpret and present data using bar charts, pictograms and tables ▪ solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables ▪ understand and use simple scales (for example, 2, 5, 10 units per cm) in pictograms and bar charts with increasing accuracy ▪ continue to interpret data presented in many contexts	▪ interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs ▪ solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs ▪ understand and use a greater range of scales in their representations ▪ begin to relate the graphical representation of data to recording change over time	▪ solve comparison, sum and difference problems using information presented in a line graph ▪ complete, read and interpret information in tables, including timetables ▪ connect work on coordinates and scales to interpretation of time graphs ▪ begin to decide which representations of data are most appropriate and why	▪ interpret and construct pie charts and line graphs and use these to solve problems ▪ calculate and interpret the mean as an average ▪ connect work on angles, fractions and percentages to the interpretation of pie charts ▪ encounter and draw graphs relating two variables, arising from own enquiry and in other subjects ▪ connect conversion from km to miles in measurement to its graphical representation ▪ know when it is appropriate to find the mean of a data set