The Sequence of Learning:Mathematics

Vision: At River we believe that everyone can achieve in Mathematics.

At River Primary School, our intent for mathematics is to teach a rich, balanced and progressive curriculum, using Maths to reason, problem solve and develop fluent, conceptual understanding in each area.

We intend for all our children to develop 'Number Sense' during their time at our school; giving them the tools they need to tackle mathematical problems. We use the NCETM Professional Development Materials to support our teachers with their planning and delivery of number.

The children will access a full mathematics curriculum where they will use a range of mathematical tools (including manipulatives and drawings) to support their maths learning.

Children will have the opportunity to discuss their learning with their Maths Learning Coach as well as developing independence.

Those children who need further support will receive this either in the lesson or very quickly afterwards, with an opportunity to discuss their learning with an adult.

We are committed to ensuring that all children have secure times tables knowledge by the end of year 4 and that throughout the school, children are fluent mathematicians with the skills and conceptual understanding to reason and problem solve.

	Number and Place Value	Number: Addition and Subtraction	Number: Multiplication and Division	Number: Fraction including decimals	Measurement	Geometry: Properties of shape	Geometry: Position and direction	Statistics
Foundation Stage	Numbers: children count reliably with numbers from 1 to 20, place them in order	Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer. Say one more and one less than a given number	Doubling and halving: Recognising that numbers are made up of smaller parts e.g. 6 = 2 lots of 3 or 3 lots of 2	They solve problems, including doubling, halving and sharing.	Orders two or three items by length or height. Orders two items by weight or capacity. Uses everyday language related to time. Beginning to use everyday language related to money Orders and sequences familiar events. Measures short periods of time in simple ways.	Beginning to use mathematical names for 'solid' 3D shapes and 'flat' 2-D shapes, and mathematical terms to describe shapes. Selects a particular named shape. Uses familiar objects and common shapes to create and recreate patterns and build models.	Can describe their relative position such as 'behind' or 'next to'.	Record using marks that they can interpret or explain. Create 'live' data using children or real life objects to represent the data.
Reasoning and Problem Solving – including stem sentences	Understand the link between numbers and quantity (representing numbers in many ways) Investigate how quantities can be made of smaller parts (for example 6 can be made of 2 threes or 3 twos, a 4 and a 2, 5 and 1 etc). Exploring how quantities change when you add more or take some away. Know how numbers relate to each other so that they can order and compare them. Encourage children to invent their own games using mathematical vocabulary and jottings. Explore patterns in a range of real-life contexts. Children begin to use the sentence stem 'I know this because….'							
Key Vocabulary and symbols	More, less, half, double, one more, one less, order, bigger, larger, smaller, longer shorter, taller, what's the same, what's different, more, fewer, equal, the same +, - , =							
Assessment	Observation during sessions							
Resources	Concrete apparatus (Dienes, Numicon, Bears, Camels, counters) some children begin to make pictorial representations of number or use objects to represent numbers. Other resources: use of number blocks to provide visual support and help develop number sense.							
Support for	Targeted intervention for groups of pupils who are not reaching GLD. Occasional 1:1 intervention. Maths opportunities encouraged through continuous provision.							

children working below Age Related Expectations (ARE)	Participating in NCETM Mastery of Number programme = 2021-2022

	Number and Place Value	Number: Addition and Subtraction	Number: Multiplication and Division	Number: Fraction including decimals	Measurement	Geometry: Properties of shape	Geometry: Position and direction	Statistics	Algebra (Equations and Sequences)
Year 1	count to and across 100, forwards and backwards, beginning with 0or 1, or from anygiven number count, read and write numbers to 100 in numerals; given a number, identify one moreand one less identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least	Recognise the effect of adding orsubtracting zero. Children identifyone more or oneless count in multiplesof twos, fives and tens read, write and interpret mathematical statements involving addition, subtraction and equals signs represent and use number bonds and related subtraction factswithin 20 add and subtract one-digit and two-digit numbers	Count in multiplesof twos, fives and tens Solve one-step problems involving multiplication anddivision, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.	Recognise a 'whole' or 'part ofa whole' and when an object issplit into equal parts. recognise, find and name a half asone 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. Pupils connect halves and quarters to the equal sharing and	Compare, describe and solve practical problems for: lengths and heights mass/weight capacity and volume time 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	recognise and name common 2-D and 3-D shapes, including: 2-D shapes [for example, rectangles (including squares), circlesand triangles] 3-D shapes [for example, cuboids (including cubes), pyramids and spheres]. Pupils handle common 2-D and 3-D shapes, naming these and related everyday objects fluently. They recognise	Describe position, direction and movement, including whole, half, quarter and three-quarter turns.	Create 'live' data using children or real life objects to represent the data. (Link to other subject areas: geography – what sort of house do you livein? Science: how many rainy days in the month?)	*solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and* ***missing number problems*** *such as* *7 = □ - 9* (Also in addition and subtraction) *represent and use number bonds and related subtraction facts within 20* (Also in addition and subtraction) *sequence events in chronological order using language such as: before and after, next, first, today,*

	Read and write numbers from 1-20 in numerals and words Use ordinal numbers (1st, 2nd, 3rd)	to 20, including zero Solve one-step word problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems e.g. 5 + ? = 10		grouping of sets ofobjects and to measures, as well as recognising and combing halves and quarters as parts of a whole	denominations ofcoins and notes sequence eventsin chronological order use language relating to dates, including days of the week, weeks,months and years tell the time to the hour and half-past the hour and draw the hands on a clock face to show these times.	these shapes in different orientations and sizes, and know that rectangles, triangles, cuboids and pyramids are not always similar to each other			*yesterday, tomorrow, morning, afternoon and evening* (Also in Measurement)
Reasoning and Problem Solving – including stem sentences	They discuss and solve problems in familiar practical contexts, including using quantities. Problems should include the terms: put together, add, altogether, total, take away, distance between, difference between, more than and less than, so that pupils develop the concept of addition and subtraction and are enabled to use these operations flexibly. Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher. Use of Stem Sentences as detailed in NCETM Profession Development Materials Sort, count, order and represent objects in different ways. Use language like 'What is the same and what is different about …? I have sorted the shapes into groups of …. These numbers are different because…. I know that he/she is correct because… My answer shows that…								
Key Vocabulary and symbols	equal to, more than, less than (fewer), most, least, numerals, multiples, distance between, difference between, add and subtract introduce < > and = symbols, + - x ÷, digit before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening, days of the week, weeks, months and years								

	Quicker, slower, earlier, later, capacity, mass, volume, weight, measurement, longer shorter, heavy, light, heavier than, lighter than, full/empty, more than, less than, half, half full, quarter left and right, top, middle and bottom, on top of, in front of, above, between, around, near, close and far, up and down, forwards and backwards, inside and outside.
Assessment	Target Tracker statements highlighted weekly Use of pre-assessment before new maths topic to aid targeted planning
Resources	Dienes and pictorial methods for addition and subtraction – counting backwards and finding a difference using bar models and number lines. Part-whole models for addition and subtraction Begin to notice repeated addition as multiplication Use of Numicon
Support for children working below Age Related Expectations (ARE)	Opportunities for peer support in lessons and intervention/support from the class teacher. Use of manipulatives to further support mathematical understanding. Use of the small steps in the NCETM Profession Development Materials Participating in NCETM Mastery of Number programme = 2021-2022

	Number and Place Value	Number: Addition and Subtraction	Number: Multiplication and Division	Number: Fraction including decimals	Measurement	Geometry: Properties of shape	Geometry: Position and direction	Statistics	Algebra (Equations and Sequences)
Year 2	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) and be able to exchange identify, represent and estimate numbers using different representations, including the number line compare and order numbers from 0 up to 100; use <, > and = signs read and write numbers to at	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 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	recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers and the links between multiplication and division. calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs Know the impact of multiplying by	recognise, find, name and write fractions 1/3, ¼, 2/4, ¾ of a length, shape, set of objects or quantity. write simple fractions for example, ½ of 6 =3 and recognise the equivalence of and ½ and 2/4 count up to 10 on a number line in fraction jumps They connect unit fractions to equal sharing and grouping, to numbers when they can be	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	identify and describe the properties of 2D 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] compare and sort common 2-D and 3-D	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 and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise).	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. .	recognise and use the inverse relationship between addition and subtraction and use this to check calculations and **missing number** problems. (Also in Addition and Subtraction) compare and sequence intervals of time (Also in Measurement) order and arrange combinations of mathematical objects in patterns (Also in Geometry:

	least 100 in numerals and in words use place value and number facts to solve problems. As they become more confident with numbers up to 100, pupils are introduced to larger numbers todevelop further their recognition of patterns within the number system and represent them indifferent ways, including spatial representations. Pupils should partition numbersin different ways (for example, 23 =20 + 3 and 23 = 10 + 13) to support subtraction. They become	objects,pictorial representations, and mentally, including: a two-digit number and one 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) andsubtraction of one number from another cannot recognise and usethe inverse relationship between addition and subtraction and use this to check	1 and 0 show that multiplication of two numbers can be done in any order (commutative) and division of one number byanother cannot solve problems involving multiplication anddivision, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.	calculated, and to measures, finding fractions of lengths, quantities, sets of objects or shapes.	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 thetime to five minutes, including quarterpast/to the hour and draw the hands on a clock face to show these times know the	shapes and everyday objects.			position and direction)

	fluent and apply their knowledge of numbers to reason with, discuss and solve problems that emphasise the value of each digit in two-digit numbers. They begin to understand zero as a place holder.	calculations and solve missing number problems. Begin to record addition and subtraction in columns.			number of minutes in an hour and the number of hoursin a day.				
Reasoning and Problem Solving – including stem sentences	S olve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts. They use commutativity and inverse relations to develop multiplicative reasoning (for example, 4 × 5 = 20 and 20 ÷ 5 = 4). solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change Use of Stem Sentences as detailed in NCETM Profession Development Materials Use language like 'What is the same and what is different about … ? I have sorted the shapes into groups of …. These numbers are differentbecause…. I know that he/she is correct because… My answer shows that… If I know this then I also know…., I have used a drawing to show that …. Use sentences to create a convincing argument Stem sentences for multiplication / division ie There are ? groups. There are ? in a group. There are ? altogether								
Key Vocabulary and symbols	Build on previous year group and add the following: commutative, sum, difference, lots of. Groups of, sets of, sharing out, division, divisor, equivalence, equivalent, numerator, denominator, fraction bar, hours, minutes, seconds, five past etc. five to etc. pounds and pence, half as high'; 'twice as wide'.quadrilaterals and polygons, and cuboids, prisms and cones, size, edges, vertices, faces, straight line, rotation, right angle, clockwise, anti-clockwise,								
Assessment	Target Tracker statements highlighted weekly Use of pre-assessment before new maths topic to aid targeted planning Use old SATs papers to bench mark children End of KS1 Sats Assessments								
Resources	Use of concrete and pictorial calculation methods – moving towards abstract and ways of using jottings. Fractions, practical equipment and then drawing round amounts for fractions. Use of Numicon. Use Cuisenaire for fractions, this can also be linked to division using number tracks.								
Support for children	Use of learning coaches throughout the year Opportunities for peer support in lessons and intervention/support from the class teacher. Use of manipulatives to further support mathematical								

working below Age Related Expectations (ARE)	understanding. Use of the small steps in the NCETM Profession Development Materials Participating in NCETM Mastery of Number programme = 2021-2022

	Number and Place Value	Number: Addition and Subtraction	Number: Multiplication and Division	Number: Fraction including decimals	Measurement	Geometry: Properties of shape	Geometry: Position and direction	Statistics	Algebra (Equations)
Year 3	count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number compare and order numbers up to 1000 identify, represent and estimate numbers using different representations read and write numbers up to 1000 in numerals and in words solve number problems and practical problems involving these ideas. Partition 3 digit	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 with a focus on exchange estimate the answer to a calculation	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	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 recognise, find and write fractions of a discrete set of objects: unit fractions and non- unit fractions with small denominators recognise and use fractions as numbers: unit fractions and non- unit fractions with small	measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) include mixed units to begin to understand conversions e.g. 5m and 500cm 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,	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;	Link to angles work Clockwise, anti-clockwise and turn	interpret and present data using bar charts, pictograms and tables use information presented in scaled bar charts and pictograms and tables	solve problems, including **missing number** problems, using number facts, place value, and more complex addition and subtraction. (Also in Addition and Subtraction) solve problems, including **missing number** problems, involving multiplication and division, including integer scaling (Also in Multiplication and Division)

	numbers in different ways.	and use inverse operations to check answers solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects. Begin to use more formal written methods for multiplication and division (when children are ready for-this).	denominators recognise and show, using diagrams, equivalent fractions with small denominators add and subtract fractions with the same denominator within one whole e.g. compare and order unit fractions, and fractions with the same denominators solve problems that involve all of the above.	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 [for example to calculate the	identify whether angles are greater than or less than a right angle Identify horizontal and vertical lines and pairs of perpendicular and parallel lines.			

					time taken by particular events or tasks].				
Reasoning and Problem Solving – including stem sentences	Solve number problems and practical problems involving these ideas. Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction. Using a ***variety of representations***, including those related to measure, pupils continue to count in ones, tens and hundreds, so that they become fluent in the order and place value ofnumbers to 1000. Pupils practise adding and subtracting fractions with the same denominator through a variety of increasingly complex problems to improve fluency. Create and use data to solve one and two step problems Use of Stem Sentences as detailed in NCETM Profession Development Materials If I increase this digit then ….. I know that this is …. And therefore this is …… ….. is three times as a big as ….. construct convincing arguments								
Key Vocabulary and symbols	Build on previous year group and then: integer, decimal, tenths, hundredths, fifths, 8ths understanding of the 'whole' being split into that many pieces. Fraction bar, unit and non-unitfractions, volume, capacity, perimeter, analogue, Vertical, horizontal, parallel and perpendicular, product								
Assessment	NFER Testing Target Tracker statements to track pupils. End of Year Expected Standard document for Year 4 Use of pre-assessment before new maths topic to aid targeted planning								
Resources	Children begin to familiarise themselves with column method for addition and subtraction, using manipulatives to represent digits initially until children are ready to move on to pictorial and then abstract methods. Aim for most children to be fluent at using written methods for addition and subtraction by the end of year 3. Adding and subtracting fractions –Cuisenaire rods, fraction cards. Children move on to using counters in PV tables and circling groups to support division methods alongside written method.								
Support for children working below Age Related Expectations (ARE)	All children have a Learning Coach who can support them during a lesson Those children who are operating below ARE are supported through small groups and additional adult focus. Interventions take place for those children who are not secure with calculations. Use of manipulatives to further support mathematical understanding. Use of the small steps in the NCETM Profession Development Materials								

	Number and Place Value	Number: Addition and Subtraction	Number: Multiplication and Division	Number: Fraction including decimals	Measurement	Geometry: Properties of shape	Geometry: Position and direction	Statistics	Algebra (Formulae)
Year 4	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	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.	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	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,	Convert between different units of measure [for example, kilometre to metre; 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	compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes identify acute and obtuse angles and compare and order angles up to two right angles by size identify lines of symmetry in 2-D shapes presented in different orientations Complete a simple symmetric figure with respect to a specific line	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.	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.	Perimeter can be expressed algebraically as 2(a + b) where a and b are the dimensions in the same *unit.*

	different representations round any number to the nearest 10, 100 or 1000 solve number and practical problems that involve all of		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.	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 recognise and write decimal equivalents to a quarter, a half, three quarters find the effect of dividing a one- or two-digit number by 10 and	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.	of symmetry.			

				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					
Reasoning and	solve number and practical problems that involve all of the above and with increasingly large positive numbers								

Problem Solving – including stem sentences	solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why. 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 converting from hours to minutes; minutes to seconds; years to months; weeks to days. solve simple measure and money problems involving fractions and decimals to two decimal places. Use of Stem Sentences as detailed in NCETM Profession Development Materials I can see that … therefore…. Because I know… I also know …. Construct convincing arguments
Key Vocabulary and symbols	Build on previous year group and then: negative numbers, Pupils write statements about the equality of expressions (for example, use the distributive law $39 \times 7 = 30 \times 7 + 9 \times 7$ and associative law $(2 \times 3) \times 4 = 2 \times (3 \times 4)$). They combine their 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. Discrete and continuous data
Assessment	NFER Testing Target Tracker statements to track pupils. End of Year Expected Standard document for Year 4 Use of pre-assessment before new maths topic to aid targeted planning Times tables Statutory testing
Resources	Fractions (use rods, begin to link to bar modelling and encourage children to draw their answers).
Support for children working below Age Related Expectations (ARE)	All children have a Learning Coach who can support them during a lesson Those children who are operating below ARE are supported through small groups and additional adult focus. Interventions take place for those children who are not secure with calculations. Use of manipulatives to further support mathematical understanding. Use of the small steps in the NCETM Profession Development Materials

	Number and Place Value	Number: Addition and Subtraction	Number: Multiplication and Division	Number: Fraction including decimals	Measurement	Geometry: Properties of shape	Geometry: Position and direction	Statistics	Algebra (Equations)
Year 5	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	add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar additionand 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	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 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	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 >	convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) understand and use approximate equivalences between metric units and common imperialunits such as inches, pounds and pints measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres calculate and compare the	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 indegrees (°) identify: angles at a point and one whole turn (total 360°) and angles at a pointon a straight line and half a turn (total 180°) and other	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.	solve comparison, sum and difference problems using information presented in a line graph Complete, read and interpret information in tables, including timetables.	*use the properties of rectangles to deduce related facts and find* ***missing lengths and angles*** (Also in Geometry: Properties of Shapes)

	whole numbers, including through zero round any number up to 1000 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.	subtraction multi- step problems in contexts, deciding which operations and methods to use and why.	for two-digit numbers multiply and divide numbers mentally drawing upon known number 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, 100and 1000 recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3) solve problems involving	1 as amixed number 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 numbers as fractions recognise and use thousandths and relate them to	areaof rectangles (including squares), and including using standard units, square centimetres (cm2) and square metres (m2) and estimate the area of irregular shapes estimate volume [(for example, using 1 cm3 blocks to build cuboids (including cubes)] and capacity [for example, using water] solve problems involving converting between units of time Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation,	multiplesof 90° 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 sidesand angles.			

			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.	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	including scaling.				

				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: half, quarter, 1 fifth, 2 fifth and 4 fifths and those fractions with a denominator of a multiple of 10 or 25.					
Reasoning and Problem Solving – including stem sentences	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates. Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling. solve problems involving number up to three decimal places solve problems involving converting between units of time Use of Stem Sentences as detailed in NCETM Profession Development Materials Because I know this and this … , Construct convincing arguments, including why examples do not fit/meet the criteria								
Key Vocabulary and symbols	Build on previous year groups degrees for angles and temperature								

	factors, multiples, introduction to algebra (using letters to represent numbers) cube, square, prime number e.g. x^2 x^3
Assessment	NFER Testing Target Tracker statements to track pupils. End of Year Expected Standard document for Year 5 Use of pre-assessment before new maths topic to aid targeted planning
Resources	Fractions: use of Cuisenaire rods and models and images. Bar modelling for calculations.
Support for children working below Age Related Expectations (ARE)	All children have a Learning Coach who can support them during a lesson Those children who are operating below ARE are supported through small groups and additional adult focus. Interventions take place for those children who are not secure with calculations. Use of manipulatives to further support mathematical understanding. Use of the small steps in the NCETM Profession Development Materials

	Number and Place Value	Number: Addition and Subtraction	Number: Multiplication and Division	Number: Fraction including decimals	Measurement	Geometry: Properties of shape	Geometry: Position and direction	Statistics	Algebra (Formulae, sequences and Equations)
Year 6	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.	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	use common factors to simplify fractions; use common multiples to express fractions in the same denomination compare and order fractions, including fractions > 1 add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions multiply simple pairs of proper fractions, writing the	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 [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	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	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	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.	interpret and construct pie charts and line graphs and use these to solve problems Calculate and interpret the mean as an average.	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

		the formal written method of short division where appropriate, interpreting remainders according to the context perform mental calculations, including with mixed operations and large numbers identify common factors, common multiples and prime numbers use their knowledge of the order of operations	answer in its simplest form divide proper fractions by wholenumbers associate a fraction with a division and calculate decimal fraction equivalents [for example, 0.375] identify the value of each digit in numbers given to three decimal places Multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places	solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.	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 (cm3) and cubic metres (m3), and extending to other units [for example, mm3	and know that the diameter is twice the radius recognise angles where they meet at a point, are ona straight line, orare vertically opposite, and find missing angles.			

					and km3].				
Reasoning and Problem Solving – including stem sentences	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 [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 Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples. Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why Solve number and practical problems that involve all of the above. Use of Stem Sentences as detailed in NCETM Profession Development Materials Create convincing arguments to prove or disprove a rule Encourage the use of bar modelling to solve problems.								
Key Vocabulary and symbols	All previous vocabulary and ... Equation, algebraic expression, formula, input and output, function – children should be familiar with using a fraction bar as a division symbol and therefore placing the divisor under the bar. This will support their learning in algebra and fractions lessons.								
Assessment	Use of past SATs papers at the end of each term. Regular arithmetic papers Target Tracker statements to track pupils. End of Year Expected Standard document for Year 6 Use of pre-assessment before new maths topic to aid targeted planning								
Resources	Children should be able to judge when to use a formal or written method. Children should use formal methods in calculations with confidence. Some children may still need to usepictorial or concrete resources and should follow the calculation policy where necessary.								
Support for children working below Age Related Expectations (ARE)	Those children who are operating below ARE are supported through small groups and additional adult focus. Interventions take place for those children who are not secure with calculations. Use of manipulatives to further support mathematical understanding. Use of the small steps in the NCETM Profession Development Materials								