The Sequence of Learning:

Mathematics

Vision:

At Blean we believe that everyone can achieve in Mathematics. 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 peers as well as developing independence. Those children who need further support will receive this before the lesson (through pre-teaching), during the lesson or very quickly afterwards in a Learning Zone session 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.

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

The Sequence of Learning:

Mathematics

	Number and Place Value	Number: Addition and Subtraction	Number: Multiplication and Division	Number: Fractions including decimals	Measurement	Geometry: properties of shape	Geometry: position and direction	Statistics
Foundation for growth 	**(ELG: NUMBER): Have a deep understanding of number to 10, including the composition of each number.** **-Subitise (recognise quantities without counting) up to 5.** **(ELG: Numerical patterns): Verbally count beyond 20, recognising the pattern of the counting system.** **-Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.** Mastering Number: Explore the concept of 'wholes' and 'parts'	**(ELG: NUMBER): Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.** **Understand the 'one more than/one less than' relationship between consecutive numbers.**	**(ELG: NUMERIAL PATTERNS): Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally**	Begin to recognise pairs and halves	***Make comparisons between objects relating to size, length, weight and capacity*** .	***Select shapes appropriately: And combine shapes to make new ones*** ***Talk about and explore 2D and 3D shapes*** ***Select, rotate and manipulate shapes in order to develop spatial reasoning skills.*** Mastering Number: Explore symmetrical patterns, in which each side is a familiar pattern, linking this to 'double	Understand position through words alone – for example, "The bag is under the table," – with no pointing. Describe a familiar route. Discuss routes and locations, using words like 'in front of' and 'behind'.	Experiment with their own symbols and marks as well as numerals. Create 'live' data using children or real life objects to represent the data. Children can begin to explore and work out mathematical problem using signs and symbols, including (where appropriate) standard numerals, tallies and "+" and "="a

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….' • Through daily Mastering number sessions develop the ability to subistise arrangements and develop verbal counting to 20 and beyond, including counting from different starting numbers
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, subitise, total, full, half-full, empty, shape names, sides, corners, edges, faces, bar model, difference, expression, part-part/whole • +, - , =
Assessment	• Evaluations weekly on guided Maths tasks (planning documents) • Tapestry observations and photographs • Mathematics Baseline (Dfe) • Termly tracking against statements on Target Tracker
Links to calculation policy	• Concrete apparatus (Numicon, compare bears, Camels, two sided counters, multilink, ten frames, five frames, 2d and 3d shapes, Rekenreks) some children begin to make pictorial representations of number or use objects to represent numbers. • Other resources: use of Mastering Number and number blocks to provide visual support and help develop number sense.
Support for pupils operating below ARE	• Targeted intervention for groups of pupils who are not reaching ARE. 1:1 intervention highlighted on Provision maps. Maths opportunities encouraged through continuous provision and adult scaffolding.

	Number and Place Value	Number: Addition and Subtraction	Number: Multiplication and Division	Number: Fractions including decimals	Measurement	Geometry: properties of shape	Geometry: position and direction	Statistics
Seed 	• 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;	• Recognise the effect of adding or subtracting zero. • Children identify one more or one less. • count in multiples of twos, fives and tens	• count in multiples of twos, fives and tens • Solve one-step problems involving multiplication and division, by calculating the answer using	• Recognise a 'whole' or 'part of a whole' and when an object is split into equal parts. • recognise, find and name a half as one of two equal	• Compare, describe and solve practical problems for: • lengths and heights mass/weight • capacity and volume • time	• recognise and name common 2-D and 3-D shapes, including: • 2-D shapes [for example, rectangles (including squares), circles and triangles]	• 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 live in? Science: how

	given a number, identify one more and 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 • Read and write numbers from 1 to 20 in numerals and words. • Use ordinal numbers (1st. 2nd, 3rd etc)	• 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.	concrete objects, pictorial representations and arrays with the support of the teacher.	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 grouping of sets of objects and to measures, as well as recognising and combining halves and quarters as parts of a whole.	• measure and begin to record the following: lengths and heights mass/weight capacity and volume time (hours, minutes, seconds) • recognise and know the value of different denominations of coins and notes • sequence events in chronological order using language • recognise and 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.	• 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 these shapes in different orientations and sizes, and know that rectangles, triangles, cuboids and pyramids are not always similar to each other.		many rainy days in the month?)
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. 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	All vocabulary from the previous year group. Additional vocabulary: • equal to, more than, less than (fewer), most, least, numerals, multiples, distance between, difference between, add and subtract, sum, addend, minuend, subtrahend, expression, equation • 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	• Use of Friday learning review to revisit concepts taught previously or in previous year group. • White Rose Assessments: Arithmetic and Reasoning % given • Target Tracker statements to track pupils.
Links to calculation policy	Use of Numicon for halving and doubling 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
Support for pupils operating below ARE	• Opportunities for peer support in lessons and intervention/support from the class teacher. Use of manipulatives to further support mathematical understanding. An additional intervention (at a separate time to the maths lesson) to secure place value knowledge and number bonds. • Pre-teaching where appropriate for some learners. • Bespoke curriculum where appropriate.

	Number and Place Value	Number: Addition and Subtraction	Number: Multiplication and Division	Number: Fractions including decimals	Measurement	Geometry: properties of shape	Geometry: position and direction	Statistics
Sprouting seed 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	• solve problems with addition and subtraction: • using concrete objects and pictorial representations, including those involving numbers, quantities and measures • applying their increasing	• 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.	• 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	• 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	• 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	• 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	• 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

	• 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 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 to develop further their recognition of patterns within the number system and represent them in different ways, including spatial representations. • Pupils should partition numbers in different ways (for example, 23 = 20 + 3 and 23 = 10 + 13) to support subtraction. They become fluent and apply their	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 representations, and mentally, including: - a two-digit number and ones - a two-digit number and tens - two two-digit numbers - adding three one-digit numbers • show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot • recognise and use the inverse relationship between addition and subtraction and use this to check calculations	• 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 1 and 0 • 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.	• 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 calculated, and to measures, finding fractions of lengths, quantities, sets of objects or shapes.	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	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 shapes and everyday objects.	distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise).	categories by quantity • ask and answer questions about totalling and comparing categorical data. • *Statistics objectives are also covered in science lessons as part of a living things topic.*

	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.	and solve missing number problems.			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. • ***Pupils read and write names for shapes that are appropriate for their word reading and spelling.***			
Reasoning and Problem Solving Including stem sentences	• solve 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 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… • 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	• Use of Friday learning review to revisit concepts taught previously or in previous year group. • White Rose Assessments: Arithmetic and Reasoning % given • Target Tracker statements to track pupils. • Use old SATs papers to bench mark children in Term 3/4							

Links to calculation policy	• 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 pupils operating below ARE	Opportunities for peer support in lessons and intervention/support from the class teacher. Use of manipulatives to further support mathematical understanding. An additional intervention (at a separate time to the maths lesson) to secure place value knowledge and number bonds up to 20, then 50 and then pairs to 100 (multiples of ten first). • Pre-teaching where appropriate for some learners. • Bespoke curriculum where appropriate.							
	Number and Place Value	Number: Addition and Subtraction	Number: Multiplication and Division	Number: Fractions including decimals	Measurement	Geometry: properties of shape	Geometry: position and direction	Statistics
Sprout 3 	• 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 representations • read and write numbers up to 1000 in numerals and in words	• 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	• 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	• 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 denominators • recognise and show, using diagrams, equivalent fractions with small denominators	• 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, including using Roman numerals from I to XII, and	• 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	• Link to angles work Clockwise, anti-clockwise and turn.	• 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.

	• solve number problems and practical problems involving these ideas. • Partition 3 digit numbers in different ways.	• 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.	connected to m objects. • Begin to use more formal written methods for multiplication and division (when children are ready for-this).	• add and subtract fractions with the same denominator within one whole e.g. $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$] • compare and order unit fractions, and fractions with the same denominators • solve problems that involve all of the above.	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 time taken by particular events or tasks].	• Identify horizontal and vertical lines and pairs of perpendicular and parallel lines.		
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 of numbers 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 • 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-unit fractions, volume, capacity, perimeter, analogue, • Vertical, horizontal, parallel and perpendicular, • product							
Assessment	• Use of Friday learning review to revisit concepts taught previously or in previous year group. • White Rose Assessments: Arithmetic and Reasoning % given • Target Tracker statements to track pupils							
Links to calculation policy	• 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 pupils operating below ARE	• Opportunities for peer support in lessons and intervention/support from the class teacher. Use of manipulatives to further support mathematical understanding. An additional intervention (at a separate time to the maths lesson) to secure place value knowledge and number bonds up to 20, then 50 and then pairs to 100 (multiples of ten first). Use of catch up maths intervention to support this. • Pre-teaching where appropriate for some learners. • Bespoke curriculum where appropriate.							
	Number and Place Value	Number: Addition and Subtraction	Number: Multiplication and Division	Number: Fractions including decimals	Measurement	Geometry: properties of shape	Geometry: position and direction	Statistics
Sapling 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	• 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	• 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	• 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	• 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	• 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	• 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

	(thousands, hundreds, tens, and ones) • order and compare numbers beyond 1000 • identify, represent and estimate numbers using different representations • 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.	and methods to use and why.	• 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.	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 • 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 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	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.	in different orientations • Complete a simple symmetric figure with respect to a specific line of symmetry.		bar charts, pictograms, tables and other graphs.

				and decimals to two decimal places.				
Reasoning and Problem Solving Including stem sentences	• solve number and practical problems that involve all of the above and with increasingly large positive numbers • 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. • I can see that … therefore…. • Because I know… I also know …. Construct convincing arguments • (see white rose doc for stem sentences linked to place value and understanding of powers of 10.							
Key Vocabulary and symbols	• Build on previous year group and then: negative numbers, negative 1 for example. Use both negative and minus when introducing concept to the children. • Pupils 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)). 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	• Use of Friday learning review to revisit concepts taught previously or in previous year group. • White Rose Assessments: Arithmetic and Reasoning % given and times tables scores (complete online and paper) • Target Tracker statements to track pupils. • End of Year Expected Standard document for Year 4 • Times tables Statutory testing							
Links to calculation policy	• Fractions (use rods, begin to link to bar modelling and encourage children to draw their answers). • Formal written methods for addition, subtraction, multiplication and division.							
Support for pupils operating below ARE	• Opportunities for peer support in lessons and intervention/support from the class teacher. Use of manipulatives to further support mathematical understanding. An additional intervention (at a separate time to the maths lesson) to secure place value knowledge and number bonds up to 20, then 50 and then pairs to 100 (multiples of ten first). Use of catch up maths intervention to support this. • Use of HLTA led group where appropriate • Pre-teaching							
	Number and Place Value	Number: Addition and Subtraction	Number: Multiplication and Division	Number: Fractions including decimals	Measurement	Geometry: properties of shape	Geometry: position and direction	Statistics
Small tree 5	• read, write, order and compare numbers to at least 1 000 000 and determine	• add and subtract whole numbers with more than 4 digits, including using formal written methods	• identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers	• compare and order fractions whose denominators are all multiples of the same number	• convert between different units of metric measure (for example, kilometre and metre;	• identify 3-D shapes, including cubes and other cuboids, from 2-D representations	• Identify, describe and represent the position of a shape following a reflection or translation, using	• solve comparison, sum and difference problems using information

	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.	(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.	• 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 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 • recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)	• 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 • 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 tenths, hundredths and decimal equivalents • round decimals with two decimal places to the nearest whole	centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) • 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 • calculate and compare the area of 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	• know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles • draw given angles, and measure them in degrees (°) • identify: - angles at a point and one whole turn (total 360°) - angles at a point on a straight line and half a turn (total 180°) - other multiples of 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 sides and angles.	the appropriate language, and know that the shape has not changed.	presented in a line graph • Complete, read and interpret information in tables, including timetables.

			• 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. • Begin to explore long division.	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: half, quarter, 1 fifth, 2 fifth and 4 fifths and those fractions with a denominator of a multiple of 10 or 25. • Ratio (Year 6)	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, including scaling. • Calculate time around the world using different time zones – link to geography • Science – measure forces in Newtons.			
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 • Because I know this and this … , • Construct convincing arguments, including why examples do not fit/meet the criteria							

	• See White Rose for sentence stems linked to each unit and files on sharepoint.
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	• Use of Friday learning review to revisit concepts taught previously or in previous year group. • White Rose Assessments: Arithmetic and Reasoning % given. • Times tables tests and division facts to be carried out at least every other week. • Target Tracker statements to track pupils.
Links to calculation policy	• Fractions: use of Cuisenaire rods and models and images. Bar modelling for calculations. • Four operations and calculation methods to support each.
Support for pupils operating below ARE	Opportunities for peer support in lessons and intervention/support from the class teacher. Use of manipulatives to further support mathematical understanding. An additional intervention (at a separate time to the maths lesson) to secure place value knowledge and number bonds up to 20, then 50 and then pairs to 100 (multiples of ten first). Use of catch up maths intervention to support this. • Pre-teaching where appropriate for some learners. • Bespoke curriculum where appropriate.

	Number and Place Value	Number: Addition and Subtraction Multiplication and Division	Number: Fractions including decimals	Ratio and Proportion	Measurement	Geometry: properties of shape	Geometry: position and direction	Statistics
Mature tree with fruit 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	• 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	• 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	• 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	• 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	• 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,	• 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. <u>Algebra</u>

	calculate intervals across zero • Solve number and practical problems that involve all of the above.	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 • 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 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	• multiply simple pairs of proper fractions, writing the answer in its simplest form • divide proper fractions by whole numbers • associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction • 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	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.	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 (cm3) and cubic metres (m3), and extending to other units [for example, mm3 and km3].	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.		• 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.
Reasoning and Problem Solving	• 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							

Including stem sentences	• 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. • Create convincing arguments to prove or disprove a rule • See White Rose for specific stem sentences linked to each unit of work. • 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
Links to calculation policy	• 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 use pictorial or concrete resources and should follow the calculation policy where necessary.
Support for pupils operating below ARE	• Children are organised into sets for maths so that 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. • Pre-teaching where appropriate for some learners. • Bespoke curriculum where appropriate.

The Blean Values:

Curiosity	Resourcefulness	Responsibility	Resilience	Collaboration
				
Patterns: Noticing and asking questions about mathematical patterns	**Using manipulatives:** children can select and use mathematical equipment or images to help their learning.	**Respect** – respecting and celebrating both our learning and that of our peers. Be aware that other cultures might calculate in different ways.	**Persevering**: keep trying even when problems seem difficult to solve.	**Paired talk:** children have lots of opportunity for paired talk during maths lessons.
Predicting: Thinking about what might come next in a sequence of shapes, patterns or numbers.	**Algorithms** – making ordered steps for completing problem solving tasks – selecting the right calculations and the correct method to perform these.	**Self – motivation:** taking responsibility for our own learning.	**Making mistakes:** children can learn from the mistakes they are making and see mistakes as part of the learning process.	**Discussion:** Children make meaningful contributions to whole class discussions.
Estimating: roughly calculate or judge based on existing mathematical knowledge.				
Questioning: Children ask themselves questions about their learning. Have I found all of the different answers? Is there another way I could have done this? Can I explain my learning to a peer? Be open to awe and wonder of mathematics.	**Spaced retrieval:** children are able to recall mathematical skills that they have been taught previously and apply these to new concepts.	**Choice:** where children can select their own activity, they are pushing themselves to take on a challenge.	**Challenge:** tasks to include problem solving and reasoning.	**Group work:** sharing learning together (taking turns where appropriate)
	Explanations: children can use the vocabulary provided to reasoning mathematical and explain their thinking using sentence stems provided by the teacher in KS1 and then developing their own.	**Seeking support:** children should seek support from equipment, a peer or an adult once they have tried to solve it for themselves.	**Practise:** children practise written methods until they are secure with these. They should continue to practise their multiplication skills, focusing on division facts and decimals once these are secure.	**Listening:** listening to the views of others and using these ideas to support their own learning.