Year 5 Long Term Planning Maths

Autumn Term 1	
Spine 1: Number, addition and subtraction	**Knowledge**
Wk	**1.26 Composition and calculation: multiples of 1,000 up to 1,000,000** Explores the composition of six-digit, whole-thousand numbers, using the partitioning structure; applies knowledge and strategies from segments 1.17 and 1.18 (taught in year 3) combined with unitising in 1,000s, as well as column methods and rounding.	• Know that understanding of numbers composed of hundred thousands, ten thousands and one thousands can be supported by making links to numbers composed of hundreds, tens and ones. • Know that multiples of 1,000 up to 1,000,000 can be placed in the linear number system by drawing on knowledge of the place of numbers up to 1,000 in the linear number system. • Know that numbers can be ordered and compared using knowledge of their composition and of their place in the linear number system. • Know that calculation approaches for numbers up to 1,000 can be applied to multiples of 1,000 up to 1,000,000. • Know that numbers can be rounded to simplify calculations or to indicate approximate sizes. • Know that known patterns can be used to divide 10,000 and 100,000 into two, four and five equal parts. These units are commonly used in graphing and measures.
Wk	**1.27 Negative numbers: counting, comparing and calculating** Introduces children to negative numbers, making links to everyday contexts; explores addition and subtraction below zero and across zero.	• Know that positive and negative numbers can be used to represent change. • Know that positive and negative numbers can be used to represent change. • Know that the negative/minus symbol (−) is placed before a numeral to indicate that the value is a negative number. • Know that negative numbers can be shown on horizontal scales; numbers to the left of zero are negative (less than zero) and numbers to the right of zero are positive (greater than zero). The larger the value of the numeral after the negative/minus symbol, the further the number is from zero. • Know that knowledge of the positions of positive and negative numbers in the number system can be used to calculate intervals across zero. • Know that negative numbers are used in coordinate and graphing contexts.
HALF TERM	

Addend + Addend = Sum
Minuend – Subtrahend = Difference

Autumn Term 2	
Spine 1: Number, addition and subtraction	**Knowledge**
Wk	**1.28 Common Structures and the part-part-whole relationship** Extends the part–part–part–whole structure (three or more parts) to solve missing part/whole problems in a range of contexts; draws on number composition and additive concepts from across the spine, focusing on the structural equivalence of the problems.	• Know that mathematical relationships encountered at primary level are either additive or multiplicative; both of these can be observed within the structure of part–part–whole relationships. • Know that problems in many different contexts can be solved by adding together the parts to find the whole. Different strategies can be used to calculate the whole, but the structure of the problem remains the same. • Know that if the value of the whole is known, along with the values of all but one of the parts, the value of the missing part can be calculated. Different strategies can be used to calculate the missing part, but the structure of the problem remains the same. • Know that problems in many different contexts have the 'missing-part' structure.
Wk	**1.29 Using equivalence and the compensation property to calculate** Explores the effect on the sum of changing the value of one or both addends; explores the effect on the difference of changing the value of the minuend, the subtrahend or both. Applies knowledge of compensation properties and inverse operations to calculate and balance equations.	• Know that if one addend is increased and the other is decreased by the same amount, the sum stays the same. • Know that if one addend is increased (or decreased) and the other is kept the same, the sum increases (or decreases) by the same amount. • Know that if the minuend and subtrahend are changed by the same amount, the difference stays the same. • Know that if the minuend is increased (or decreased) and the subtrahend is kept the same, the difference increases (or decreases) by the same amount. • Know that if the minuend is kept the same and the subtrahend is increased (or decreased), the difference decreases (or increases) by the same amount. • Know that the value of the expressions on each side of an equals symbol must be the same; addition and subtraction are inverse operations. We can use this knowledge to balance equations and solve problems.

Spring Term 1	
Spine 2: Multiplication and division	**Knowledge**
Wk	**2.18 Using equivalence to calculate** Develops efficiency in calculation by using equivalence, through adjusting the factors (in multiplication) and the dividend and divisor (in division).	• Know that for multiplication, if there is a multiplicative *increase* to one factor and a corresponding *decrease* to the other factor, the product stays the same. • Know that for division, if there is a multiplicative change to the dividend and a corresponding change to the divisor, the quotient stays the same.
Wk	**2.19 Calculation: x/÷ decimal fractions by whole numbers** Develops strategies for multiplying and dividing decimal fractions by whole numbers, including combining known facts with unitising, multiplying and dividing by 10 and 100, and using adjusting strategies.	• Know that decimal fractions (with a whole number of tenths or hundredths) can be multiplied by a whole number by using known multiplication facts and unitising. • Know that multiplying by 0.1 is equivalent to dividing by 10; multiplying by 0.01 is equivalent to dividing by 100. Understanding of place value can be used to divide a number by 10/100: when a number is divided by 10, the digits move one place to the right; when a number is divided by 100, the digits move two places to the right. • Know that to multiply a single-digit number by a decimal fraction with up to two decimal places, convert the decimal fraction to an integer by multiplying by 10 or 100, perform the resulting calculation using an appropriate strategy, then adjust the product by dividing by 10 or 100. • Know that if the multiplier is less than one, the product is less than the multiplicand; if the multiplier is greater than one, the product is greater than the multiplicand. • Know that to divide any decimal fraction with up to two decimal places by a single-digit number, convert the decimal fraction to an integer by multiplying by 10 or 100, perform the resulting calculation using an appropriate strategy, then adjust the quotient by dividing by 10 or 100.
HALF TERM	

Factor x Factor = Product

Spring Term 2	
Spine 2: Multiplication and division	**Knowledge**
Wk	**2.20 Multiplication with three factors and volume** Uses multiplication to calculate the volume of cuboids and shapes comprised of several cuboids; uses division to solve associated inverse problems. Uses associativity and commutativity to solve abstract multiplication problems with three factors.	• Know that volume is the amount of space that something occupies. • Know that volume is measured in cubic units, such as cubic centimetres (cm^3) and cubic metres (m^3). • Know that the volume of a cuboid can be calculated by multiplying the length, width and height. • Know that both the commutative law and the associative law can be applied when multiplying three or more numbers. • Know that the choice of which order to multiply in can be made according to the simplest calculation.
Wk	**2.21 Factors, multiples, prime numbers and composite numbers** Identifies properties of factors and multiples including square and prime numbers, composite numbers, common and prime factors, and common multiples. Uses factor pairs to solve problems efficiently.	• Know that factors are positive integers that can be multiplied together to equal a given number. • Know that systematic methods can be used to find all factors of a number; factors come in pairs; all positive integers have an even number of factors apart from square numbers, which have an odd number of factors; numbers with more than two factors are called composite numbers. • Know that prime numbers are positive integers that have exactly two factors. • Know that a common factor is a factor that is shared by two or more numbers. A prime factor is a factor that is also a prime number. • Know that a multiple of a number is the product of that number and an integer; a common multiple is a multiple that is shared by two or more numbers. • Know that the factor pairs of '100' can be used to support efficient calculation.

Summer Term 1	
Spine 2: Multiplication and division	**Knowledge**
Wk	**2.22 Combining multiplication with addition and subtraction** Learns to combine multiplication with addition or subtraction. Learns to use brackets to change the order of operations. Builds on knowledge of the distributive law.	• Know that multiplication can be combined with addition and subtraction; when there are no brackets, multiplication is completed before addition or subtraction; when there are brackets, the calculation within the brackets is completed first. • Know that when adding or subtracting multiplication expressions that have a common factor, the distributive law can be applied.
Spine 3: Fractions	**Knowledge**
Wk	**3.7 Finding equivalent fractions and simplifying fractions** Discovers how equivalent fractions have the same proportional relationship between the numerator and denominator, and therefore have the same numerical value. Converts between equivalent fractions and simplifies fractions.	• Know that when two fractions have different numerators and denominators to one another but share the same numerical value, they are called 'equivalent fractions'. • Know that equivalent fractions share the same proportional (multiplicative) relationship between the numerator and denominator. • Know that equivalent fractions can be generated by maintaining that relationship through the process of multiplication and division. • Know that fractions can be simplified by dividing both the numerator and denominator by a common factor.
HALF TERM	

Summer Term 2	
Spine 3: Fractions	**Knowledge**
Wk	**3.8 Common denomination: more adding and subtracting** Learns to add and subtract fractions with different denominators by first finding a common denominator. Compares fractions using a range of methods, including converting to a common denominator.	• Know that in order to add related fractions, first convert one fraction so that both share the same denominator (a *'common denominator'*). • Know that to subtract related fractions, first convert one fraction so that both share a common denominator. • Know that the common denominator method can be extended to adding and subtracting non unit related fractions. • Know that to add and subtract *non-related* fractions, the product of the two denominators provides a common denominator. • Know that converting to common denominators is one of several methods that can be used to compare fractions.

Aspects of shape and measure are covered within the spines but additional opportunities for practical measure and handling shapes will be built in.

Prioritisation units that could be useful.
Money
Area and Scaling
Converting units
Angles