



Year 6 Long Term Planning Maths

Addend + Addend = Sum
Minuend – Subtrahend = Difference

		Autumn Term 1
Spine 1: Number, addition and subtraction		Knowledge
Wks 1-6	1 Calculating Using knowledge of structures (1) <i>(1.28) 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.</i>	- 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. - Know that 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. - Know that problems in many different contexts have the 'missing-part' structure.
	<i>(1.29) 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.</i>	- 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.
		HALF TERM

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Year 6 Long Term Planning Maths

Autumn Term 2	
Spine 1: Number, addition and subtraction	Knowledge
Wks 7-8 2 Multiples of 1.000 <i>(1.26) Explores the composition of six-digit, whole-thousand numbers, using the partitioning structure; apply knowledge and strategies from segments 1.17 and 1.18 combined with unitising in 1,000s, as well as column methods and rounding.</i>	• <i>Know that numbers composed of hundred thousands, ten thousands and one thousands can be supported by making links to numbers composed of hundreds, tens and ones.</i> • <i>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.</i> • <i>Know that numbers can be ordered and compared using knowledge of their composition and of their place in the linear number system.</i> • <i>Know that calculation approaches for numbers up to 1,000 can be applied to multiples of 1,000 up to 1,000,000.</i> • <i>Know that numbers can be rounded to simplify calculations or to indicate approximate sizes.</i> • <i>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.</i>
Wks 9-12 3 Numbers up to 10,000,000 <i>(1.30) Building on segment 1.26, explores six-digit numbers that are not whole thousands, and then extends to seven-digit numbers; applies additive facts and strategies, including column algorithms, and rounding to these numbers.</i>	• Knows how patterns seen in other powers of ten can be extended to the unit 1,000,000. • Knows that seven-digit numbers can be written, read and ordered by identifying the number of millions, the number of thousands and the number of hundreds, tens and ones. • Knows that the digits in a number indicate its structure so it can be composed and decomposed. • Knows that knowledge of crossing thousands boundaries can be used to work to and across millions boundaries. • Knows that sometimes numbers are rounded as approximations to eliminate an unnecessary level of detail; rounded numbers are also used to give an estimate or average. • Knows that sometimes, precise readings are required. • Knows that fluent calculation requires the flexibility to move between mental and written methods according to the specific numbers in a calculation.
Wks 13-14 Into Spring 4 Geometry: Draw, Compose and decompose shapes	• Knows how to draw, sketch and recognises polygons based on their properties. • Know how to recognise nets that can form specific 3D shapes. • Knows how to explores areas of different compound shapes. • Knows how to recognises that 2 congruent triangles can form a rectangular parallelogram. • Knows how to explore the relationship between areas and perimeters of different shapes.

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Year 6 Long Term Planning Maths

Dividend $\div$ Divisor = Quotient

Factor x Factor = Product

Spring Term 1		
Spine 2: Multiplication and Division		Knowledge
Wks 1-4	5 Multiplication and Division <i>(2.18) Develops efficiency in calculation by using equivalence, through adjusting the factors (in multiplication) and the dividend and divisor (in division).</i>	- 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.
	(2.23) Develops strategies for multiplying two numbers with two or more digits, including adjusting strategies when multiplying by a power of ten, partitioning followed by multiplication and addition of partial products, and long multiplication.	- Know that when multiplying two numbers that are multiples of 10, 100 or 1,000, multiply the number of tens, hundreds or thousands and then adjust the product using place value. - Know that when multiplying two numbers where one number is a multiple of 10, 100 or 1,000, use short multiplication and adjust the product using place value. - Know that two two-digit numbers can be multiplied by partitioning one of the factors, calculating partial products and then adding these partial products. This method can be extended to multiplication of three-digit numbers by two-digit numbers. - Know that 'Long multiplication' is an algorithm involving multiplication, then addition of partial products, which supports multiplication of two numbers with two or more digits. - Know that multiplication where one of the factors is a composite number can be carried out by multiplying one factor and then the other factor.
	(2.24) Learns to divide by two-digit divisors, recording calculations using either the short or long division algorithm. Represents remainders in an appropriate way, according to the context, including using the short or long division algorithm to express remainders as decimal fractions.	- Know that any two- or three-digit dividend can be divided by a two-digit divisor by skip counting in multiples of the divisor (quotient < 10); these calculations can be recorded using the short or long division algorithms. - Know that any three- or four-digit dividend can be divided by a two-digit divisor using the short or long division algorithms (including quotient ≥ 10). - Know that when there is a remainder, the result can be expressed as a whole-number quotient and a whole-number remainder, as a whole-number quotient and a proper-fraction remainder, or as a decimal-fraction quotient.
	(2.25) Learns how multiplication and division calculations are affected when one element of the calculation is multiplied or divided by a scale factor.	- Know that for multiplication, if there is a multiplicative change to one factor, the product changes by the same scale factor. - Know that for division, if there is a multiplicative change to the dividend and the divisor remains the same, the quotient changes by the same scale factor. - Know that for division, if there is a multiplicative increase to the divisor and the dividend remains the same, the quotient decreases by the same scale factor; if there is a multiplicative decrease to the divisor and the dividend remains the same, the quotient increases by the same scale factor.

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Wks 5-6	6 Area, perimeter, position and direction (2.30) Builds on earlier knowledge of area and perimeter. Learn to find the area of parallelograms and triangles by identifying the perpendicular height. Compare areas and perimeters and apply scale factors to side-length, perimeter and area.	• Know how to calculate the area of triangles and parallelograms. • Know how to explain that shapes with the same perimeter can have different areas and vice versa. • Know how to use scale factors to describe the relationship between lengths and the perimeters of 2 shapes. Additional resources needed to cover position and direction. • Know how to describe position using all four quadrants on a coordinate grid. • Know how to perform translations and reflections accurately on the coordinate grid..
HALF TERM		

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Year 6 Long Term Planning Maths

Spine 3: Fractions		Spring Term 2
Spine 3: Fractions		Knowledge
Wks 7- 12	7 Fractions and Percentages <i>(3.7) 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 simplify fractions.</i>	- 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.
	<i>(3.8) 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.</i>	- Know that 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.
	<i>(3.9) Explores how to multiply two fractions. Learns how to divide a fraction by a whole number by first converting to an equivalent multiplication. Reviews how multiplying by a proper fraction makes a number smaller.</i>	- Know that when a fraction is multiplied by a proper fraction, it makes it smaller. To multiply two fractions, multiply the numerators and multiply the denominators. - Know that when a fraction is divided by a whole number, it makes it smaller. To divide a fraction by a whole number, convert it to an equivalent multiplication. - Know that a more efficient method can be used to divide a fraction by a whole number when the whole number is a factor of the numerator.
	<i>(3.10) Makes connections between fractions and previous work on decimals. Learns common fraction and decimal equivalences. Understands that percentages tell us about the proportion being considered. Finds percentages of quantities.</i>	- Know that some fractions are easily converted to decimals. - Know that fraction-decimal equivalents can be found throughout the number system. - Know that <i>Percent</i> means number of parts per hundred. A percentage can be an operator on a quantity, indicating the proportion of a quantity being considered. - Know that percentages have fraction and decimal equivalents. - Know that if the value of a whole is known, a percentage of that number or amount can be calculated.

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Further Details on the Summer Units to follow as they are released by the NCETM.

Summer Term 1		
		Knowledge
	8 Statistics (1 week)	- Know how to interpret and construct pie charts and line graphs and use these to solve problems. - Know how to calculate and interpret the mean as an average.
Key Stage 2 Tests		
Spine 2: Multiplication and Division		Knowledge
	9 Ratio and Proportion (2 weeks) (2.27) Scale Factors and Proportional Reasoning. Uses bar modelling and ratio grids to reason about multiplicative relationships between two or more cardinal quantities, and explores correspondence problems. Extends understanding of scaling measures to make and interpret maps and scale/compare the dimensions of similar shapes.	- Know that multiplication and division can be used to calculate unknown values in correspondence (cardinal comparison) problems. - Know that multiplication and understanding of correspondence can be used to calculate the number of possible combinations of items. - Know that scaling can be used to make and interpret maps. - Know that there is a proportional relationship between the dimensions of similar shapes; if the scale factor and the dimensions of one of the shapes is known, the dimensions of the similar shape can be calculated; if the dimensions of both of the shapes are known, the scale factor can be calculated.
Spine 1: Addition and Subtraction		Knowledge
	10 Calculating using knowledge of structures (2) (1 week) (1.29) Using equivalence and the compensation property to calculate. <i>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.</i>	<i>Know that if one addend is increased and the other is decreased by the same amount, the sum stays the same.</i> <i>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.</i> <i>Know that if the minuend and subtrahend are changed by the same amount, the difference stays the same.</i> <i>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.</i> <i>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.</i> <i>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.</i>
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Summer Term 2		
Spine 1: Addition and Subtraction		Knowledge
	11 Solving Problems with two unknowns (2 weeks) (1.31) Solving problems with two unknowns. Equips children with strategies for solving problems with two unknowns, including using the bar model to represent relationships between known numbers, and working systematically.	- Know that problems with two unknowns can have one solution or more than one solution (or no solution). A relationship between the two unknowns can be described in different ways, including additively and multiplicatively. - Know that model drawing can be used to expose the structure of problems with two unknowns. - Know that a problem with two unknowns has only one solution if the sum of the two unknowns and the difference between them is given (<i>'sum-and-difference problems'</i>) or if the sum of the two unknowns and a multiplicative relationship between them is given (<i>'sum-and-multiple problems'</i>). - Know that other problems with two unknowns have only one solution. - Know that some problems with two unknowns can't easily be solved using model drawing but can be solved by a 'trial-and-improvement' approach; these problems may have one solution, several solutions or an infinite number of solutions.
Spine 2: Multiplication and Division		Knowledge
	12 Order of Operations (2.22) Combining multiplication with addition and subtraction. Learn to combine multiplication with addition or subtraction. Learn to use brackets to change the order of operations. Build on knowledge of the distributive law.	<i>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.</i> <i>Know that when adding or subtracting multiplication expressions that have a common factor, the distributive law can be applied.</i>
	(2.28) Combining division with addition and subtraction. Learn to combine division with addition or subtraction. Revisit the use of brackets to change the order of operations. Build on knowledge of the distributive law.	- Know that division can be combined with addition and subtraction; when there are no brackets, division is completed before addition or subtraction; when there are brackets, the calculation within the brackets is completed first. - Know that when adding or subtracting division expressions that have a common divisor, the distributive law can be applied.
	13 Mean average (2.26) Mean Average and equal shares. Understand the concept of mean average and learn how to find the mean of a set of data. Use the mean to compare sets of data and learn when it is appropriate to use the mean.	- Know that the mean is the size of each part when a quantity is shared equally. - Know that the mean is defined as the sum of all the numbers in a set of data divided by the number of numbers/values that make up the set of data. If we know the mean of a set of data and the number of numbers/values in that set, we can calculate the total of the set. The mean of a set changes if the total value of the set changes or if the number of numbers/values in the set changes. - Know that the mean can be used to compare data. - Know that the mean is not always an appropriate representation of a set of data.

Information based on the Curriculum Prioritisation Teaching Sequence [NCETM](#).

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