Curriculum Map for Year 5 2018-2019

WITH FLUENCY, REASONING, PROBLEM SOLVING

Autumn Term 14 weeks 6 + 8		Spring Term 12 weeks 6 + 6		Summer Term 12 weeks 5 + 7	
3 weeks	Number and place value and properties of number	1 week	Decimals and percentages	2 weeks	Decimals and percentages
		1 week	Property of Number revision, place value (make sure mental fluency)		
2 weeks	Calculating + and –	1 week	Calculating + and -	1 week	Calculating + and -
1 week	Measure	2 weeks	Calculating x and /	2 weeks	Calculating x and /
HALF TERM		HALF TERM		HALF TERM	
2 weeks	Fractions	2 weeks	Measure	2 weeks	Fractions with decimals and percentages
3 weeks	Calculating x and /	2 weeks	Fractions	1 week	Calculating problem solving with 4 ops
2 weeks	Geometry – Shape and Angles	1 week	Calculating problem solving with 4 ops	2 weeks	Statistics
1 week	Decimals and percentages	1 week	Geometry – Position and direction	1 week	Geometry - Shape
				1 week	Revision / Assessment (can be switched weeks)

Year 5 Curriculum Map

AUTUMN TERM

Week	Objective	Additional info and guidance
Aut 1 **1** **2** **3**	**Number and Place Value and Properties of Number** ·read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit ·count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 ·interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero ·round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 ·solve number problems and practical problems that involve all of the above ·identify multiples and factors, including finding all factor pairs of a number, and common factors of 2 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 ·recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3}) Halving (this supports number line work by estimating where half way is) Finding mystery numbers or marking them on differently scaled number lines. Making and comparing numbers using digits cards and completing equations with digit cards to make statements correct.	Find and describe linear and non linear sequences Use factors and multiples to construct equivalence statements (for example, 4 x 35 = 2 x 2 x 35; 3 x 270 = 3 x 3 x 9 x 10 = 92 x 10). Chn need to be able to use and apply their understanding of place value in different ways – see Testbase for ideas on how to structure / question Lots of step counting and chanting Rounding skills need to be ongoing https://www.ncetm.org.uk/resources/42499 ***Read and write numbers to at least 1,000,000:*** Noting the pattern of three digits and commas. Do lots of practice reading these numbers aloud, noting zero as a place holder. ***Recognise the place value of each digit to 1,000,000 – the significance of the position of each digit to its value/size*** Partitioning using arrow cards, base ten and place value counters. Making numbers using digits cards. Partition numbers in different ways i.e. 12,256 = 10,000 + 2000 + 200 + 50 + 6 = 10,000 + 2,000 + 200 + 40 + 16 etc. Explore these patterns. Explore the idea of = as equivalence and balance using empty box partitions Review from Y4: Find 1000 more or less than a given number. Explore empty boxes on number lines, broken number squares (e.g. a cross shape or L shape) Ask questions such as 'how many 1,000s in 80,000?' to deepen understanding. ***Round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000*** Placing on a number line (with different scales and starting points). Focus particularly on numbers greater than 1,000 as this is when children start to have problems visualizing. Use a number line to support rounding; this as a key image. Remember that number lines do not need to sit horizontally, or start at zero! Work on working out the size of the intervals, finding half way if that helps, positioning the number and then checking it makes sense. Teach away from the misconception that 36,800 is 7,000 rounded to the nearest thousand. Explore questions such as 'how many hundredths in a tenth?' 'How many thousandths in a tenth?' to deepen understanding. ***Solve number and practical problems that involve all of the above.*** Solve empty box problems that rely on understanding of place value. Include problems with = and inequalities <> ***Read, write, order and compare numbers with up to three decimal places.*** Use number lines to order and compare, and place value counters to partition and compare decimal numbers. ***Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero.*** Use temperature as a context to explore negative numbers and use number lines to find increases and decreases bridging zero. ***Solve number and practical problems that involve all of the above.*** **Solve empty box problems that rely on understanding of place value. Include problems with = and inequalities <>** Use scales on measuring equipment and link this with work on number lines and decimal fractions. ***Read Roman numerals to 1000 (M) and recognise years written in Roman numerals.*** Compare with our number system and convert from one system to another. This does not need more than a couple of lessons! ***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.*** Chn must be able to describe any number in terms of its properties. Use factor bugs, Venn and Carroll diagrams. Chn to solve reasoning problems about properties of numbers such why are all multiples of 4 also multiples of 2? Factoring numbers in different ways: use arrays, Cuisenaire rods, Numicon or bar models to explore factors. Investigate patterns in multiples and rules of divisibility.

Year 5 Curriculum Map

Aut 1 **4** **5**	**Calculating + and -** ·add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) ·add and subtract numbers mentally with increasingly large numbers ·use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy ·solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. KS1 and LKS2 review: basic but still important! Mental addition strategies without counting on! **Calculate don't count and apply all these strategies to larger or decimal numbers**: -Quick adds e.g. 20 + 7 then 23 + 6 'because I know 3 + 6 = 9' -Using bonds to 10 -Partitioning single digit numbers in different ways to bridge 10 e.g. 27 + 5 = 27 + 3 + 2 -Finding near doubles rather than adding e.g. 30 + 31 -Adding nearly numbers like 19 by adding 20 and adjusting. -Add strings of numbers by finding bonds and doubles. Reinforce law of commutativity for + so we don't have to do it from left to right! Find rules for and complete additive number sequences. Play games such as Shall I risk it? Making and comparing numbers using digits cards and completing equations with digit cards to make statements correct.	Don't just limit to word problems - this is about how numbers work together and how to be flexible in manipulating numbers, with a large emphasis on mental strategies / different ways of doing things, games and manipulating numbers – how could you do this? What is the best way? Why does this way work well? Good mathematicians are lazy – finding short cuts / quickest ways / most efficient strategies. Make explicit different mental strategies and how to increase efficiency (such as using number bonds, near doubles etc) . Chn to think about when it is quicker to take away and when it is quicker to count on (find difference). Pupils practise using the formal written methods of columnar addition and subtraction with increasingly large numbers to aid fluency They practise mental calculations with increasingly large numbers to aid fluency (for example, 12 462 – 2300 = 10 162). Chn must have fail safe method for both – column addition and column subtraction. Think carefully about any chn for whom column subtraction may not be suitable – back track. Use intelligent practice to build up complexity of calculations chn are required to do. Look at different examples – why is it hard? Why is it easy? E.g. 3010 – 1678 – why is this 'hard'? 6789 – 2345 – why is this 'easy'? Constantly need to be requiring chn to check their work (using inverse, estimations, is it sensible). Subtractions should always be checked with a column addition in case of 'classic' column subtraction errors. Work on resilience in problem solving – keep going until they know it is right – keep trying different things. Lots of emphasis on working systematically and methodically when tackling problems. Don't just limit to word problems – use Testbase for wider range of contexts / puzzles / problems. https://www.ncetm.org.uk/resources/42550 ***Add and subtract numbers mentally with increasingly large numbers*** Write calculations horizontally and tell children to assess whether mental methods will be quick and efficient. Use addition calculations which involve bridging multiples of 100 or 1,000 Use 'friendly numbers' which partition easily to take away e.g. 12,462 – 2,300 Use numbers which are close to each other where finding the difference mentally supported by number line jottings would be most efficient. Explore the rule 'if it's looking at you' find the difference e.g. 2,003 – 1,899. Find the difference between amounts of money that involve finding change, times and dates on time lines, mentally. Estimate answers first using rounding and check with the inverse. ***Use rounding to check answers to calculations and determine, in the context of a problem, levels of accurac:*** Draw number lines and refer back to place value work to round numbers to the nearest 10, 100 etc. as appropriate. ***Add numbers with more than four digits (different amounts of digits and more than two numbers) using compact columnar addition*** Encourage checking that a mental method wouldn't be more efficient! Write calculations horizontally. Use place value counters to ensure understanding of compact method. Add numbers with multiple carrying. Add numbers with different numbers of digits including up to three decimal places. Add piles of numbers (more than 2 numbers) where the carry goes over 20. Find bonds to 10 and doubles in your pile to add quickly! Estimate answers first using rounding and *use + to check subtractions …* ***Subtract numbers with more than four digit numbers using compact columnar subtraction*** Review of Y4: Partition use base 10 and then place value counters. Partition numbers in different ways as a precursor to columnar subtraction. e.g. 124 = 100 + 20 + 4 or 100 + 10 + 14 etc. Explore these types of patterns. Show expanded subtraction alongside compact to ensure understanding. Design calculations so they can't be done quickly mentally and use intelligent practice e.g. one exchange from tens to ones, then multiple exchanges, then what happens when there's a zero! Use base 10 and then place value counters. Estimate answers first using rounding and check with the inverse ***Recognise and use the inverse relationship between + and - and use this to check calculations and solve missing number problems.*** ***Solve addition and subtraction multi-step problems in context, deciding which operations and methods to use and why.*** Write calculations in different ways e.g. 2.3 = ? + 1.2 ; 4.3 + 2.5 = ? – 0.8; and 1,002 + 1,005 < ? – 2 but with larger or decimal numbers. Where there is more than one possible solution, explore what the largest or smallest could possibly be. Use bar models to show whole part-part inverse relationships and to help children decide which operation to carry out. Pose word problems and problems in different contexts which require different calculation strategies and ensure that it is not just word problems that children have to deal with.

Year 5 Curriculum Map

Aut 1 **6**	**Measures** ·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 imperial units such as inches, pounds and pints ·use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling. Multiplying and dividing by 10 , 100 and 1,000 including decimal places as starters/games/warm ups. Estimating where numbers should be placed on different number lines (scales) Review 2-D shape names and question about their properties	Use measure as opportunity to apply calculating skills. Use range of scales for chn to interpret – link with number lines. With any measures problem involving an unmarked scale, the first thing to do is work out the scale – can do this by trial and error, using a marked half way point if there is one, or dividing the interval by number of markers. ***Estimate, compare and calculate different measures.*** Focus on measuring capacity, mass and length accurately using practical equipment. Relate scales to a different type of number line and addition and subtraction methods used in the previous unit of work. ***Measure and calculate perimeter of composite rectilinear shapes in cm and m.*** Use real life contexts to pose word problems involving missing dimensions. Lots of rich reasoning to be done here! ***Convert between different units of measure [for example, kilometre to metre].*** Explore this under the banner of 'equivalence'. Compare and estimate different masses, lengths and capacities. Use measuring equipment to show equivalence on scales. E.g. show 0-1kg on a line next to 0-1,000g and find equivalences. Include scales and parts of scales which do not go from 0-1 … i.e. 3 – 4 kg next to a line of 3,000 – 4,000 g **Temperature** Including negative numbers (reading scales and solving problems)

Year 5 Curriculum Map

	HALF TERM	
Aut 2 **1** **2**	**Fractions** ·compare and order fractions whose denominators are all multiples of the same number ·identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths ·recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements >1 as a mixed number[for example,2⁄5+4⁄5=6⁄5= 11⁄5] ·add and subtract fractions with the same denominator and denominators that are multiples of the same number ·multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams Review from Year 4: Count in fractional steps starting from any number and using different fraction families i.e. 1/5 family or ¼ family. Explore equivalence as you go. Use a counting stick to count in 1/3s beyond 1 whole! Discuss equivalence and improper fractions how else could we say 4/3? Find rules and missing fractions in sequences.	Pupils connect equivalent fractions > 1 that simplify to integers with division and other fractions > 1 to division with remainders, using the number line and other models, and hence move from these to improper and mixed fractions. Pupils connect multiplication by a fraction to using fractions as operators (fractions of), and to division, building on work from previous years. This relates to scaling by simple fractions, including fractions > 1. Being able to find equivalence is essential. Step counting in fractions. Fractions as: Part whole Numbers Measures Operators https://www.ncetm.org.uk/resources/42655 **The Number System: Fractions *as* numbers** *Y4 Review: Recognise and show, using diagrams, families of common equivalent fractions* Review equal and unequal pieces and understanding of families of fractions whose denominators have a common factor. Use fraction cards. ***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.*** Find fractions of shapes linking to equivalence e.g. If you have 3/6 shaded on a shape, this is the same as ½. Extend this to tenths and hundredths. Use and build fraction walls showing equivalence between families. Use fraction cards to explore equivalence within one family e.g. 1/3 1/6 1/12 Ensure enough visual models are used to support writing equivalences such as 4/10 = 40/100 including fraction cards, fraction walls, bar models, 100 grids representing one whole, or Numicon. ***Add and subtract fractions with the same denominator and denominators that are multiples of the same number.*** Use fraction cards to add and subtract fractions within the same family, starting with those with the same denominator. These may tip over one whole into improper fractions and mixed numbers. https://www.ncetm.org.uk/resources/43609 Bar models are also useful for exploring addition and subtraction of fractions. ***Recognise mixed numbers and improper fractions and convert from one form to the other. Write mathematical statements >1 as a mixed number for example 2/5 + 4/5 = 6/5 = 1 1/5***

Year 5 Curriculum Map

Aut 2 **3** **4** **5**	**Calculating x and /** ·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 1,000 Use mad minutes to identify times tables which are weak - chant these times tables (or one you will link calculations to during the lesson). Remember to make stratgeis for recalling times tables explicit still, e.g. 4s are double 2s, 5s are half 10s etc. Doubling and halving by partitioning Multiply and divide numbers by 10 and 100 and 1000 Divide multiples of 100 by 20 and 25 by chunking in 20s or 25s. Find rules and missing numbers in multiplicative sequences. (Not always horizontally… show sequences with circles and arrows between, for example. Include missing numbers on measuring scales too!) Making and comparing numbers using digits cards and completing equations with digit cards to make statements correct.	Teach how to interpret division where answers have a remainder. Pupils use and explain the equals sign to indicate equivalence, including in missing number problems (for example, 13 + 24 = 12 + 25; 33 = 5 x). Chn must have fail safe method for both – short division (bus stop) and grid method / short multiplication. ***Think carefully about who short multiplication and bus stop is suitable for – will be revisited again twice so no need for all to be doing short multiplication if not yet ready this term.*** Make explicit different mental strategies and how to increase efficiency (such as using known facts etc) Constantly need to be requiring chn to check their work (using inverse, estimations). Work on resilience in problem solving – keep going until they know it is right – keep trying different things. Lots of emphasis on working systematically and methodically when tackling problems. Don't just limit to word problems – use Testbase for wider range of contexts / puzzles / problems. https://www.ncetm.org.uk/resources/42605 ***The key Y5 objective relating to the Y4 review below is: Multiply and divide numbers mentally drawing upon known facts*** *Y4 Review: Recall and use multiplication and division facts for multiplication tables up to 12 X 12* Assess which times tables children have the most difficulty in recalling rapidly. Repeat teaching and chanting of these. Make links with doubling and doubling where it is useful. Make links with properties of numbers. Explore the law of commutativity by showing arrays. These are factor pairs. Create 'If I know this… I know that…' statements. Multiply by 0 and 1 and then divide by 1. Multiply three numbers together. Explain the ÷ as 'how many groups of this are in that' and as the inverse of multiplication. Use derived facts to divide mentally. Find remainders (picture this on a number line, chunking forwards or using arrays). Divide numbers related to times table facts mentally e.g. I know 42 ÷7 = 6 so 420 ÷7 = 60 *Use recall of x and ÷facts and place value to multiply larger numbers mentally and explore the effect of multiplying numbers by 10, 100 and 1,000* ***Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.*** Discuss zeros as place holders, how the numbers are becoming 10 times bigger or smaller (scaling) and avoid misconceptions about adding 0. Use procedural variation to explore patterns and the *effect of multiplying a number by 10 or 100 e.g.* *3 X 7 = 21 30 X 7 = 210 30 X 70 = 2100 3 X 70 = 210 etc.* ***Multiply numbers up to 4 digits by one digit (short multiplication) or two digits (long multiplication) using the formal written method.*** Ensure that calculations don't lend themselves to using a mental method like doubling and doubling again to X4! For example, calculate 14 X 4 by…Doubling 14 and doubling again or 14 X 4 = (10 X 4) + (4 X 4) … the distributive law. Show expanded columnar multiplication next to grid method, and then next to compact multiplication, examining the links. Explore misconceptions e.g. 500 X 8 within a grid is often mistakenly recorded as 400 rather than 4,000 ***Divide numbers up to 4 digits by a 1-digit number using the formal written method of short division and interpret remainders.*** This is the first time that this appears in the NC but children may have learnt this method in LKS2, regardless. Use the image of an open array to show how 'bus stop' division relates to multiplication and the grid method. Use place value counters to divide, being careful to structure examples intelligently with first one remainder and then the first digit carrying over etc. then dealing with zeros or remainders at the end. Use a number line to count up 'how many groups of and what's the remainder' so children don't 'pass' the multiple they're looking for when dividing… a common misconception e.g. 26 ÷ 3 = 8 r2 NOT 9r1 Use multiplication to check answers… this can lead to great reasoning about how to include remainders.

Year 5 Curriculum Map

Aut 2 **6** **7**	**Geometry – Shape and Angles** ·identify 3-D shapes, including cubes and other cuboids, from 2-D representations ·know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles ·draw given angles, and measure them in degrees (°) identify: -angles at a point and one whole turn (total 360°) -angles at a point on a straight line and ½ a turn (total 180°) - other multiples of 90° Backtrack to Year 4 properties of 2D and 3D shape as necessary Count in steps of 5 or 10° until you reach a right angle. Use a squeaky voice for all acute angles then a low voice for obtuse angles. Show angles with hands Count in multiples of 90, linking to the 9 X table.	*Y4 reviews (could be done as early work or brain warm-ups because some of these skills do not appear in the Y5 curriculum)* *Identify acute and obtuse angles and order angles up to two right angles by size.* *Identify lines of symmetry in 2-D shapes presented in different orientations.* Analyse properties e.g. acute and obtuse angles, equal angles, equal sides and lines of symmetry etc. *Complete simple symmetrical figures in relation to a specific line of symmetry.* Use conventional markings for parallel lines and right angles. Needs to be more than just naming properties - Use and apply knowledge of properties – investigate – try Nrich for ideas. Reasoning about shapes and properties – use Testbase as inspiration for ways to do this. Visualising skills. https://www.ncetm.org.uk/resources/42849 Remember angles are a measure of turn – how far something has turned about a set point. Link missing angles to similar missing number problems. https://www.ncetm.org.uk/resources/42849 ***Distinguish between regular and irregular polygons based on reasoning about equal sides and angles.*** Link these with 3D shapes which they define as faces. ***Identify 3-D shapes, including cubes and other cuboids, from 2-D representations*** Draw and explore nets of shapes and use straws/tooth picks etc. and blue-tack to create skeletons of 3D shapes. Lots of visualisation work will help children to visualise numbers in other areas of maths. ***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; angles at a point on a straight line and a ½ turn; other multiples of 90°*** Explore the idea of an angle being a measure of a turn. Compare and estimate angles. Introduce the protractor very slowly, ensuring understanding of what is being measured i.e. The lines showing the angle could extend forever but the angle is the same size. Emphasise the steps of using a protractor – find the zero, and line it up on the point, choose a 'base line' and line this up with zero then observe whether you are using the 'inside' numbers or the 'outside' scale to measure this angle. Always see if this matches your estimate! Spot and measure angles at different orientations. Compare with obtuse or acute angles in quadrilaterals and other shapes.

Year 5 Curriculum Map

Aut 2 **8** **Spr 1** **1**	**Decimals and Percentages (with fractions)** ·read and write decimal numbers as fractions [for example, 0.71 =71⁄100] ·recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents ·round decimals with two decimal places to the nearest whole number and to one decimal place ·read, write, order and compare numbers with up to three decimal places ·solve problems involving number up to three decimal places ·recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal ·solve problems which require knowing percentage and decimal equivalents of 1⁄2, 1⁄4,1⁄5, 2⁄5 and those fractions with a denominator of a multiple of 10 or 25. Count up and down in tenths finding equivalents e.g. 5/10 = 0.5 = half Solving empty box/missing number problems including those with inequalities. Divide numbers by 10 including whole numbers which will become 1 place decimal numbers. Counting in decimals in small steps from 0.001 to 0.1	Constant links between fractions, decimals and percentages – being able to quickly convert between gives chn much more flexibility and options for solving problems. ***Decimals:*** *Y4 Review: Recognise and write decimal equivalents of any number of tenths or hundredths.* Placing on a number line and finding nearest whole numbers. Comparing with inequalities <> and the = symbol Find complements to 1. *Y4 Review: Recognise and write decimal equivalents to $^1/_4$, $^1/_2$, $^3/_4$.* Using a blank 100 square to represent hundredths, explore why ½ = 0.5 and ¼ = 0.25 and ¾ = 0.75 Use different models and images to explore decimals – counting sticks, number lines, and Dienes equipment where a 'flat' represents 1 not 100. Relate decimals to money but use non money contexts as well. Two top tips: 'Make them look the same' – draw in the zeroes. 'Imagine its money' – link 0.01 to 1p, 0.1 to 10p – draw in the zeroes. Find complements to 1 e.g. 0.35 and 0.65. https://www.ncetm.org.uk/resources/42655 ***Recognise and use thousandths and relate them to tenths and hundredths*** Use base 10 to review learning from Y4 with one whole represented by a 100 slab, a tenth being a rod of ten and a hundredth being a small cube. We can't represent a thousandth… imagine this cube divided into 10 tiny pieces! Count up in 0.001 and show what happens after 0.009 as it becomes 0.01 etc. Explore 'zoomed in' number lines which break 1 into tenths, hundredths and then thousandths. ***Round decimals with two decimal places to the nearest whole number and to one decimal place.*** Use number lines with different starting points and different scales to place decimal numbers. Examine misconceptions about 0.011 or 0.11 etc. ***Read, write, order and compare numbers with up to three decimal places.*** Use number lines to order and compare, and place value counters to partition and compare decimal numbers. ***Read and write decimal numbers as fractions e.g. 0.71 = 71/100*** ***Solve problems which require knowing decimal and percentage equivalence.*** ***Solve problems involving numbers up to three decimal places.*** Pose empty box problems that rely on understanding of place value. Include problems with = and inequalities <> Pose word problems in contexts such as money, sharing etc. ***Percentages:*** *Y4 review: find non-unit fractions of numbers.* Find 1/10 and then 2/10 etc. of numbers by dividing by 10. Link this to work done previously on 0.1 of a number and dividing a number by 10. ***Recognise the per cent symbol and understand that % relates to 'number of parts per hundred'.*** ***Write percentages as a fraction with a denominator of 100 and as a decimal fraction.*** ***Solve problems which require knowing percentage and decimal equivalents of ½ ¼ 1/5 2/5 4/5 and those fractions with a denominator of 10 or 25.*** 100 squares where each square represents 1% are a good starting image for this. It is also useful to discuss percentages in a real-life or colloquial context e.g. 'Have you given 100%?' or 'This price has 50% off!' Colour different percentages on a 100 square and find vulgar fraction and decimal equivalents, emphasising 'parts per 100'. Find simplified equivalents e.g. ½ = 50% = 50/100 = 25/50 All of the above focuses on percentages as a thing you can count out of 100. Now shift to percentages *of* numbers. Your whole can be anything! Create problems where children have to find 50% or 25% etc. of a number. Percentage clouds are a useful way of thinking about this. If you can find 50%, 10% and 1% of a number, you can build other percentages from these starting points. Prices and discounts are a useful context. Deepen understanding by asking inverse questions or missing number questions e.g. 25% of a number is 8, what's the number?

SPRING TERM

Week	Objective	Additional info and guidance
Spr 1 1	**Decimals and Percentages (with fractions)** ·read and write decimal numbers as fractions [for example, 0.71 =71⁄100] ·recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents ·round decimals with two decimal places to the nearest whole number and to one decimal place ·read, write, order and compare numbers with up to three decimal places ·solve problems involving number up to three decimal places ·recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal ·solve problems which require knowing percentage and decimal equivalents of 1⁄2, 1⁄4,1⁄5, 2⁄5 and those fractions with a denominator of a multiple of 10 or 25.	See Autumn 2 Week 8

Year 5 Curriculum Map

	Count up and down in tenths finding equivalents e.g. 5/10 = 0.5 = half Solving empty box/missing number problems including those with inequalities. Divide numbers by 10 including whole numbers which will become 1 place decimal numbers. Counting in decimals in small steps from 0.001 to 0.1	

Year 5 Curriculum Map

Spr 1 2	**Number and Place Value and Properties of Number** ·read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit ·count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 ·interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero ·round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 ·solve number problems and practical problems that involve all of the above ·identify multiples and factors, including finding all factor pairs of a number, and common factors of 2 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 ·recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3}) Halving (this supports number line work by estimating where half way is) Finding mystery numbers or marking them on differently scaled number lines. Making and comparing numbers using digits cards and completing equations with digit cards to make statements correct.	Don't just limit to word problems - this is about how numbers work together and how to be flexible in manipulating numbers, with a large emphasis on mental strategies / different ways of doing things, games and manipulating numbers – how could you do this? What is the best way? Why does this way work well? Good mathematicians are lazy – finding short cuts / quickest ways / most efficient strategies. Make explicit different mental strategies and how to increase efficiency (such as using number bonds, near doubles etc) . Chn to think about when it is quicker to take away and when it is quicker to count on (find difference). Pupils practise using the formal written methods of columnar addition and subtraction with increasingly large numbers to aid fluency They practise mental calculations with increasingly large numbers to aid fluency (for example, 12 462 – 2300 = 10 162). Chn must have fail safe method for both – column addition and column subtraction. Think carefully about any chn for whom column subtraction may not be suitable – back track. Use intelligent practice to build up complexity of calculations chn are required to do. Look at different examples – why is it hard? Why is it easy? E.g. 3010 – 1678 – why is this 'hard'? 6789 – 2345 – why is this 'easy'? Constantly need to be requiring chn to check their work (using inverse, estimations, is it sensible). Subtractions should always be checked with a column addition in case of 'classic' column subtraction errors. Work on resilience in problem solving – keep going until they know it is right – keep trying different things. Lots of emphasis on working systematically and methodically when tackling problems. Don't just limit to word problems – use Testbase for wider range of contexts / puzzles / problems. https://www.ncetm.org.uk/resources/42550 ***Add and subtract numbers mentally with increasingly large numbers*** Write calculations horizontally and tell children to assess whether mental methods will be quick and efficient. Use addition calculations which involve bridging multiples of 100 or 1,000 Use 'friendly numbers' which partition easily to take away e.g. 12,462 – 2,300 Use numbers which are close to each other where finding the difference mentally supported by number line jottings would be most efficient. Explore the rule 'if it's looking at you' find the difference e.g. 2,003 – 1,899. Find the difference between amounts of money that involve finding change, times and dates on time lines, mentally. Estimate answers first using rounding and check with the inverse. ***Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.*** Draw number lines and refer back to place value work to round numbers to the nearest 10, 100 etc. as appropriate. ***Add numbers with more than four digits (different amounts of digits and more than two numbers) using compact columnar addition*** Encourage checking that a mental method wouldn't be more efficient! Write calculations horizontally. Use place value counters to ensure understanding of compact method. Add numbers with multiple carrying. Add numbers with different numbers of digits including up to three decimal places. Add piles of numbers (more than 2 numbers) where the carry goes over 20. Find bonds to 10 and doubles in your pile to add quickly! Estimate answers first using rounding and *use + to check subtractions …* ***Subtract numbers with more than four digit numbers using compact columnar subtraction*** Review of Y4: Partition use base 10 and then place value counters. Partition numbers in different ways as a precursor to columnar subtraction. e.g. 124 = 100 + 20 + 4 or 100 + 10 + 14 etc. Explore these types of patterns. Show expanded subtraction alongside compact to ensure understanding. Design calculations so they can't be done quickly mentally and use intelligent practice e.g. one exchange from tens to ones, then multiple exchanges, then what happens when there's a zero! Use base 10 and then place value counters. Estimate answers first using rounding and check with the inverse ***Recognise and use the inverse relationship between + and - and use this to check calculations and solve missing number problems.*** ***Solve addition and subtraction multi-step problems in context, deciding which operations and methods to use and why.*** Write calculations in different ways e.g. 2.3 = ? + 1.2 ; 4.3 + 2.5 = ? – 0.8; and 1,002 + 1,005 < ? – 2 but with larger or decimal numbers. Where there is more than one possible solution, explore what the largest or smallest could possibly be. Use bar models to show whole part-part inverse relationships and to help children decide which operation to carry out. Pose word problems and problems in different contexts which require different calculation strategies and ensure that it is not just word problems that children have to deal with.

Year 5 Curriculum Map

Spr 1 **4** **5**	**Calculating x and /** ·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 1,000 Chant and memorise weaker times tables. Explore the effect of multiplying numbers by 10, 100 and 1,000. Explore the 20 X table, the 30 X table etc. Create 'If I know this… I know that… 'statements to supersize numbers e.g. 6 X 7 = 42 so 6 X 70 = 420. Find rules and missing numbers in multiplicative/doubling or halving sequences. (Not always horizontally… show sequences with circles and arrows between, for example.)	Teach how to interpret division where answers have a remainder. Distributivity can be expressed as a(b + c) = ab + ac. Pupils use and explain the equals sign to indicate equivalence, including in missing number problems (for example, 13 + 24 = 12 + 25; 33 = 5 x). Mad Minutes Chn must have fail safe method for both – short division (bus stop) and grid method / short multiplication. Think carefully about who short multiplication is suitable for. Make explicit different mental strategies and how to increase efficiency (such as using known facts etc) Constantly need to be requiring chn to check their work (using inverse, estimations). Work on resilience in problem solving – keep going until they know it is right – keep trying different things. Lots of emphasis on working systematically and methodically when tackling problems. Don't just limit to word problems – use Testbase for wider range of contexts / puzzles / problems. https://www.ncetm.org.uk/resources/42605 ***The key Y5 objective relating to the Y4 review below is: Multiply and divide numbers mentally drawing upon known facts*** *Y4 Review: Recall and use multiplication and division facts for multiplication tables up to 12 X 12* Assess which times tables children have the most difficulty in recalling rapidly. Repeat teaching and chanting of these. Make links with doubling and doubling where it is useful. Make links with properties of numbers. Explore the law of commutativity by showing arrays. These are factor pairs. Create 'If I know this… I know that…' statements. Multiply by 0 and 1 and then divide by 1. Multiply three numbers together. Explain the ÷ as 'how many groups of this are in that' and as the inverse of multiplication. Use derived facts to divide mentally. Find remainders (picture this on a number line, chunking forwards or using arrays). Divide numbers related to times table facts mentally e.g. I know 42 ÷7 = 6 so 420 ÷7 = 60 *Use recall of x and ÷facts and place value to multiply larger numbers mentally and explore the effect of multiplying numbers by 10, 100 and 1,000* ***Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.*** Discuss zeros as place holders, how the numbers are becoming 10 times bigger or smaller (scaling) and avoid misconceptions about adding 0. Use procedural variation to explore patterns and the *effect of multiplying a number by 10 or 100 e.g.* *3 X 7 = 21 30 X 7 = 210 30 X 70 = 2100 3 X 70 = 210 etc.* ***Multiply numbers up to 4 digits by one digit (short multiplication) or two digits (long multiplication) using the formal written method.*** Ensure that calculations don't lend themselves to using a mental method like doubling and doubling again to X4! For example, calculate 14 X 4 by…Doubling 14 and doubling again or 14 X 4 = (10 X 4) + (4 X 4) … the distributive law. Show expanded columnar multiplication next to grid method, and then next to compact multiplication, examining the links. Explore misconceptions e.g. 500 X 8 within a grid is often mistakenly recorded as 400 rather than 4,000 ***Divide numbers up to 4 digits by a 1-digit number using the formal written method of short division and interpret remainders.*** Use the image of an open array to show how 'bus stop' division relates to multiplication and the grid method. Use place value counters to divide, being careful to structure examples intelligently with first one remainder and then the first digit carrying over etc. then dealing with zeros or remainders at the end. Use a number line to count up 'how many groups of and what's the remainder' so children don't 'pass' the multiple they're looking for when dividing… a common misconception e.g. 26 ÷ 3 = 8 r2 NOT 9r1 Use multiplication to check answers… this can lead to great reasoning about how to include remainders.

Year 5 Curriculum Map

HALF TERM		
Spr 2 **1** **2**	**Measures** ·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 and square metres 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 - temperature problems including negative numbers Doubling (link to perimeter) Chant / recall square numbers and cube numbers.	Missing measures questions such as these can be expressed algebraically, for example 4 + 2b = 20 for a rectangle of sides 2 cm and b cm and perimeter of 20cm. Pupils calculate the area from scale drawings using given measurements. https://www.ncetm.org.uk/resources/42796 ***Calculate and compare the area of rectangles (including squares) and use standard units, square cm and square m.*** ***Estimate the area of irregular shapes*** Show the link between the side lengths and the area of rectilinear shapes. Solve missing side length problems and work backwards from known dimensions. Investigate the changes that occur in area or perimeter when the other changes. Look at the relationship between the area of a right-angle triangle and a rectangle; a non-right-angle triangle and a rectangle by cutting or folding paper. ***Solve problems involving measure (area and volume)*** ***Estimate volume (for example using 1cm³ blocks to build cuboids including cubes or using water).*** Relate 2D rectangles with 3D cuboids and investigate how area and shape of face contributes to volume. **Temperature** Including negative numbers (reading scales and solving problems) *GARDEN*

Year 5 Curriculum Map

Spr 2 **3** **4**	**Fractions** ·compare and order fractions whose denominators are all multiples of the same number ·identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths ·recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements >1 as a mixed number[for example,2⁄5+4⁄5=6⁄5= 1 1⁄5] ·add and subtract fractions with the same denominator and denominators that are multiples of the same number ·multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams Count in fractional steps starting from different numbers and discussing equivalence.	Find 1/6 of a number, linking to multiplication and division facts. Show this pictorially with a bar model. Don't just teach a trick of dividing by the denominator and multiplying by the numerator! Find 2/6 or 3/6 etc. of a shape or a number. Link to equivalence. Is this the same as 1/3 of the same number? Repeat with 1/8 after chanting the 8 times table and reviewing division facts. Pupils connect equivalent fractions > 1 that simplify to integers with division and other fractions > 1 to division with remainders, using the number line and other models, and hence move from these to improper and mixed fractions. Pupils connect multiplication by a fraction to using fractions as operators (fractions of), and to division, building on work from previous years. This relates to scaling by simple fractions, including fractions > 1. Being able to find equivalence is essential. Step counting in fractions. Fractions as: Part whole Numbers Measures Operators https://www.ncetm.org.uk/resources/42655 ***Add and subtract fractions with the same denominator and denominators that are multiples of the same number.*** Use fraction cards to add and subtract fractions within the same family, starting with those with the same denominator. These may tip over one whole into improper fractions and mixed numbers. https://www.ncetm.org.uk/resources/43609 Bar models are also useful for exploring addition and subtraction of fractions. ***Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.*** In this context, it can be useful to read the X symbol as 'of' e.g. 1/3 x 18 = 1/3 of 18 (this needs to be altered to '18 groups of 1/3' if it is written as 18 X 1/3. You could demonstrate how if we count up in 1/3s 18 times we will get to 9 whole ones. Explore lots of examples of this, drawing diagrams with the children to picture what is happening. This can also be modelled using Numicon where 1 whole = 3. Write related equations e.g. if we know ½ X 6 =3 then is 3 ÷ 6 = ½ ? This challenges misconceptions about x always making a bigger product.

Year 5 Curriculum Map

Spr 2 5	**Calculating problem solving with 4 ops** ·add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) ·add and subtract numbers mentally with increasingly large numbers ·use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy ·solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. ·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 1,000 Find rules and missing numbers in additive sequences. (Not always horizontally… show sequences with circles and arrows between, etc. Include missing numbers on measuring scales too!) Making and comparing numbers using digits cards and completing equations with digit cards to make statements correct. Chanting weaker times tables needed up to 12 X 12.	*Y4 Review: Use recall of multiplication and division facts and place value to multiply larger numbers mentally.* Use procedural variation to explore patterns and the *effect of multiplying a number by 10 or 100 e.g.* *3 X 7 = 21 30 X 7 = 210 30 X 70 = 2100 3 X 70 = 210 etc.* Count in multiples of 6, 7, 9, 25 and 1000. Relate these to finding rules and missing numbers in multiplicative sequences. Opportunity to practice calculating skills and combine operations, including word problems with more than one step. Lots of examples of 'working backwards' type problems e.g. I bought this and this, my change was £4.56, how much money did I start with? I multiply a number by 6, add 28 and then halve the result, the answer is 50, what did I start with? (THOANs – I Think Of A Number) Go beyond 'word problems' to non context problems / puzzles – use Testbase for inspiration of types of questions. Usual guidance on chn being systematic, thorough, using annotations, and various checking strategies. *Autumn & Spring review of 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.* *Add numbers with more than four digits (different amounts of digits and more than two numbers) using compact columnar addition* *Subtract numbers with more than four digit numbers using compact columnar subtraction* *Recognise and use the inverse relationship between + and - and use this to check calculations and solve missing number problems.* *Solve addition and subtraction multi-step problems in context, deciding which operations and methods to use and why.* *Autumn & Spring review of multiplication and division:* *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 and divide whole numbers and those involving decimals by 10, 100 and 1000.* *Multiply numbers up to 4 digits by one digit (short x) or two digits (long multiplication) using the formal written method.* *Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders.* *Recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3}).* *Solve problems involving multiplication and division using knowledge of factors and multiples, squares and cubes.* ***Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.*** Use measures as a useful context for scaling problems e.g. 'My jug holds three and a half times the capacity as yours.' **One of the best methods of visualising ratio problems is the bar model. Investigate this and use it!** Use money and time as a useful context for rates e.g. 'My phone bill costs 30p per minute…' Explore problems that require us to round up or down. Some children may be ready to explore fractions as whole numbers, decimal fractions and vulgar fractions but ensure they understand this. e .g. 435 ÷ 6 = 72.5 = 72 ½ = 72 r3 ***Solve problems involving addition, subtraction, multiplication and division and a combination of these , including understanding the meaning of =*** ***Solve two-step problems using all operations in contexts, deciding which operations and methods to use and why.*** ***Use all 4 operations to solve problems involving measure (length, mass, volume, money) using decimal notation, including scaling*** Provide lots of questions which require different approaches to be solved most efficiently. Use both mental (partition and add; add nearly numbers; partition and take away; subtract nearly numbers; find the difference on a number line to find change) and written methods to solve money problems. Have plenty of plastic money and measuring equipment! Use word problems and the contexts of measuring length, mass and capacity to solve problems. Be sure to use calculations which wouldn't be solved more efficiently mentally, and involve conversions. Estimate answers first using rounding and check with the inverse.

Year 5 Curriculum Map

6	**Geometry - Position and Direction** ·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. Review 2D shape names and properties.	Always use the corners of a shape – if the corners are correctly transformed – the sides will be when you join them up. https://www.ncetm.org.uk/resources/42944 Ensure that children are translating by moving vertices of a shape to a new position. Children should be encouraged to visualise the new position, checking with a mirror or tracing paper as they go (Note: tracing paper not allowed in SATS).

Year 5 Curriculum Map

Summer Term

Week	Objective	Additional info and guidance
Sum 1 **1** **2**	**Decimals and Percentages** ·read and write decimal numbers as fractions [for example, 0.71 =71⁄100] ·recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents ·round decimals with two decimal places to the nearest whole number and to one decimal place ·read, write, order and compare numbers with up to three decimal places ·solve problems involving number up to three decimal places ·recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal ·solve problems which require knowing percentage and decimal equivalents of 1⁄2, 1⁄4,1⁄5, 2⁄5 and those fractions with a denominator of a multiple of 10 or 25. Count up and down in tenths finding equivalents e.g. 5/10 = 0.5 = half Solving empty box/missing number problems including those with inequalities. Divide numbers by 10 including whole numbers which will become 1 place decimal numbers.	Constant links between fractions, decimals and percentages – being able to quickly convert between gives chn much more flexibility and options for solving problems. ***Decimals:*** *Y4 Review: Recognise and write decimal equivalents of any number of tenths or hundredths.* Placing on a number line and finding nearest whole numbers. Comparing with inequalities <> and the = symbol Find complements to 1. *Y4 Review: Recognise and write decimal equivalents to $^1/_4$, $^1/_2$, $^3/_4$.* Using a blank 100 square to represent hundredths, explore why ½ = 0.5 and ¼ = 0.25 and ¾ = 0.75 Use different models and images to explore decimals – counting sticks, number lines, and Dienes equipment where a 'flat' represents 1 not 100. Relate decimals to money but use non money contexts as well. Two top tips: 'Make them look the same' – draw in the zeroes. 'Imagine its money' – link 0.01 to 1p, 0.1 to 10p – draw in the zeroes. Find complements to 1 e.g. 0.35 and 0.65. https://www.ncetm.org.uk/resources/42655 ***Recognise and use thousandths and relate them to tenths and hundredths*** Use base 10 to review learning from Y4 with one whole represented by a 100 slab, a tenth being a rod of ten and a hundredth being a small cube. We can't represent a thousandth… imagine this cube divided into 10 tiny pieces! Count up in 0.001 and show what happens after 0.009 as it becomes 0.01 etc. Explore 'zoomed in' number lines which break 1 into tenths, hundredths and then thousandths. ***Round decimals with two decimal places to the nearest whole number and to one decimal place.*** Use number lines with different starting points and different scales to place decimal numbers. Examine misconceptions about 0.011 or 0.11 etc. ***Read, write, order and compare numbers with up to three decimal places.*** Use number lines to order and compare, and place value counters to partition and compare decimal numbers. ***Read and write decimal numbers as fractions e.g. 0.71 = 71/100*** ***Solve problems which require knowing decimal and percentage equivalence.*** ***Solve problems involving numbers up to three decimal places.*** Pose empty box problems that rely on understanding of place value. Include problems with = and inequalities <> Pose word problems in contexts such as money, sharing etc. ***Percentages:*** *Y4 review: find non-unit fractions of numbers.* Find 1/10 and then 2/10 etc. of numbers by dividing by 10. Link this to work done previously on 0.1 of a number and dividing a number by 10. ***Recognise the per cent symbol and understand that % relates to 'number of parts per hundred'.*** ***Write percentages as a fraction with a denominator of 100 and as a decimal fraction.*** ***Solve problems which require knowing percentage and decimal equivalents of ½ ¼ 1/5 2/5 4/5 and those fractions with a denominator of 10 or 25.*** 100 squares where each square represents 1% are a good starting image for this. It is also useful to discuss percentages in a real-life or colloquial context e.g. 'Have you given 100%?' or 'This price has 50% off!' Colour different percentages on a 100 square and find vulgar fraction and decimal equivalents, emphasising 'parts per 100'. Find simplified equivalents e.g. ½ = 50% = 50/100 = 25/50 All of the above focuses on percentages as a thing you can count out of 100. Now shift to percentages *of* numbers. Your whole can be anything! Create problems where children have to find 50% or 25% etc. of a number. Percentage clouds are a useful way of thinking about this. If you can find 50%, 10% and 1% of a number, you can build other percentages from these starting points. Prices and discounts are a useful context. Deepen understanding by asking inverse questions or missing number questions e.g. 25% of a number is 8, what's the number?

Year 5 Curriculum Map

Sum 1 **3**	**Calculating + and -** ·add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) ·add and subtract numbers mentally with increasingly large numbers ·use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy ·solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. KS1 and LKS2 review: basic but still important! Mental addition strategies without counting on! **Calculate don't count and apply all these strategies to larger or decimal numbers**: -Quick adds e.g. 20 + 7 then 23 + 6 'because I know 3 + 6 = 9' -Using bonds to 10 -Partitioning single digit numbers in different ways to bridge 10 e.g. 27 + 5 = 27 + 3 + 2 -Finding near doubles rather than adding e.g. 30 + 31 -Adding nearly numbers like 19 by adding 20 and adjusting. -Add strings of numbers by finding bonds and doubles. Reinforce law of commutativity for + so we don't have to do it from left to right! Find rules for and complete additive number sequences. Play games such as Shall I risk it? Making and comparing numbers using digits cards and completing equations with digit cards to make statements correct.	Don't just limit to word problems - this is about how numbers work together and how to be flexible in manipulating numbers, with a large emphasis on mental strategies / different ways of doing things, games and manipulating numbers – how could you do this? What is the best way? Why does this way work well? Good mathematicians are lazy – finding short cuts / quickest ways / most efficient strategies. Make explicit different mental strategies and how to increase efficiency (such as using number bonds, near doubles etc) . Chn to think about when it is quicker to take away and when it is quicker to count on (find difference). Pupils practise using the formal written methods of columnar addition and subtraction with increasingly large numbers to aid fluency They practise mental calculations with increasingly large numbers to aid fluency (for example, 12 462 – 2300 = 10 162). Chn must have fail safe method for both – column addition and column subtraction. Think carefully about any chn for whom column subtraction may not be suitable – back track. Use intelligent practice to build up complexity of calculations chn are required to do. Look at different examples – why is it hard? Why is it easy? E.g. 3010 – 1678 – why is this 'hard'? 6789 – 2345 – why is this 'easy'? Constantly need to be requiring chn to check their work (using inverse, estimations, is it sensible). Subtractions should always be checked with a column addition in case of 'classic' column subtraction errors. Work on resilience in problem solving – keep going until they know it is right – keep trying different things. Lots of emphasis on working systematically and methodically when tackling problems. Don't just limit to word problems – use Testbase for wider range of contexts / puzzles / problems. https://www.ncetm.org.uk/resources/42550 ***Add and subtract numbers mentally with increasingly large numbers*** Write calculations horizontally and tell children to assess whether mental methods will be quick and efficient. Use addition calculations which involve bridging multiples of 100 or 1,000 Use 'friendly numbers' which partition easily to take away e.g. 12,462 – 2,300 Use numbers which are close to each other where finding the difference mentally supported by number line jottings would be most efficient. Explore the rule 'if it's looking at you' find the difference e.g. 2,003 – 1,899. Find the difference between amounts of money that involve finding change, times and dates on time lines, mentally. Estimate answers first using rounding and check with the inverse. ***Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.*** Draw number lines and refer back to place value work to round numbers to the nearest 10, 100 etc. as appropriate. ***Add numbers with more than four digits (different amounts of digits and more than two numbers) using compact columnar addition*** Encourage checking that a mental method wouldn't be more efficient! Write calculations horizontally. Use place value counters to ensure understanding of compact method. Add numbers with multiple carrying. Add numbers with different numbers of digits including up to three decimal places. Add piles of numbers (more than 2 numbers) where the carry goes over 20. Find bonds to 10 and doubles in your pile to add quickly! Estimate answers first using rounding and *use + to check subtractions …* ***Subtract numbers with more than four digit numbers using compact columnar subtraction*** Review of Y4: Partition use base 10 and then place value counters. Partition numbers in different ways as a precursor to columnar subtraction. e.g. 124 = 100 + 20 + 4 or 100 + 10 + 14 etc. Explore these types of patterns. Show expanded subtraction alongside compact to ensure understanding. Design calculations so they can't be done quickly mentally and use intelligent practice e.g. one exchange from tens to ones, then multiple exchanges, then what happens when there's a zero! Use base 10 and then place value counters. Estimate answers first using rounding and check with the inverse ***Recognise and use the inverse relationship between + and - and use this to check calculations and solve missing number problems.*** ***Solve addition and subtraction multi-step problems in context, deciding which operations and methods to use and why.*** Write calculations in different ways e.g. 2.3 = ? + 1.2 ; 4.3 + 2.5 = ? – 0.8; and 1,002 + 1,005 < ? – 2 but with larger or decimal numbers. Where there is more than one possible solution, explore what the largest or smallest could possibly be. Use bar models to show whole part-part inverse relationships and to help children decide which operation to carry out. Pose word problems and problems in different contexts which require different calculation strategies and ensure that it is not just word problems that children have to deal with.

Year 5 Curriculum Map

Sum 1 **4** **5**	**Calculating x and /** ·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 1,000 Chant and memorise weaker times tables. Explore the effect of multiplying numbers by 10, 100 and 1,000. Explore the 20 X table, the 30 X table etc. Create 'If I know this… I know that… 'statements to supersize numbers e.g. 6 X 7 = 42 so 6 X 70 = 420. Find rules and missing numbers in multiplicative/doubling or halving sequences. (Not always horizontally… show sequences with circles and arrows between, for example.)	Teach how to interpret division where answers have a remainder. Distributivity can be expressed as a(b + c) = ab + ac. Pupils use and explain the equals sign to indicate equivalence, including in missing number problems (for example, 13 + 24 = 12 + 25; 33 = 5 x). Mad Minutes Chn must have fail safe method for both – short division (bus stop) and grid method / short multiplication. Think carefully about who short multiplication is suitable for. Make explicit different mental strategies and how to increase efficiency (such as using known facts etc) Constantly need to be requiring chn to check their work (using inverse, estimations). Work on resilience in problem solving – keep going until they know it is right – keep trying different things. Lots of emphasis on working systematically and methodically when tackling problems. Don't just limit to word problems – use Testbase for wider range of contexts / puzzles / problems. https://www.ncetm.org.uk/resources/42605 ***The key Y5 objective relating to the Y4 review below is: Multiply and divide numbers mentally drawing upon known facts*** *Y4 Review: Recall and use multiplication and division facts for multiplication tables up to 12 X 12* Assess which times tables children have the most difficulty in recalling rapidly. Repeat teaching and chanting of these. Make links with doubling and doubling where it is useful. Make links with properties of numbers. Explore the law of commutativity by showing arrays. These are factor pairs. Create 'If I know this… I know that…' statements. Multiply by 0 and 1 and then divide by 1. Multiply three numbers together. Explain the ÷ as 'how many groups of this are in that' and as the inverse of multiplication. Use derived facts to divide mentally. Find remainders (picture this on a number line, chunking forwards or using arrays). Divide numbers related to times table facts mentally e.g. I know 42 ÷7 = 6 so 420 ÷7 = 60 *Use recall of x and ÷facts and place value to multiply larger numbers mentally and explore the effect of multiplying numbers by 10, 100 and 1,000* ***Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.*** Discuss zeros as place holders, how the numbers are becoming 10 times bigger or smaller (scaling) and avoid misconceptions about adding 0. Use procedural variation to explore patterns and the *effect of multiplying a number by 10 or 100 e.g.* *3 X 7 = 21 30 X 7 = 210 30 X 70 = 2100 3 X 70 = 210 etc.* ***Multiply numbers up to 4 digits by one digit (short multiplication) or two digits (long multiplication) using the formal written method.*** Ensure that calculations don't lend themselves to using a mental method like doubling and doubling again to X4! For example, calculate 14 X 4 by…Doubling 14 and doubling again or 14 X 4 = (10 X 4) + (4 X 4) … the distributive law. Show expanded columnar multiplication next to grid method, and then next to compact multiplication, examining the links. Explore misconceptions e.g. 500 X 8 within a grid is often mistakenly recorded as 400 rather than 4,000 ***Divide numbers up to 4 digits by a 1-digit number using the formal written method of short division and interpret remainders.*** Use the image of an open array to show how 'bus stop' division relates to multiplication and the grid method. Use place value counters to divide, being careful to structure examples intelligently with first one remainder and then the first digit carrying over etc. then dealing with zeros or remainders at the end. Use a number line to count up 'how many groups of and what's the remainder' so children don't 'pass' the multiple they're looking for when dividing… a common misconception e.g. 26 ÷ 3 = 8 r2 NOT 9r1 Use multiplication to check answers… this can lead to great reasoning about how to include remainders.

Year 5 Curriculum Map

HALF TERM		
Sum 2 **1** **2**	**Fractions, decimals and percentages** ·read and write decimal numbers as fractions [for example, 0.71 =71⁄100] ·recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents ·recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal ·solve problems which require knowing percentage and decimal equivalents of 1⁄2, 1⁄4,1⁄5, 2⁄5 and those fractions with a denominator of a multiple of 10 or 25. ·compare and order fractions whose denominators are all multiples of the same number ·identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths ·recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements >1 as a mixed number[for example,2⁄5+4⁄5=6⁄5= 11⁄5] ·add and subtract fractions with the same denominator and denominators that are multiples of the same number ·multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams	Constant links between fractions, decimals and percentages – being able to quickly convert between gives chn much more flexibility and options for solving problems. Revise all methods and equivalents for FDP and spend more time on their weaker areas – see previous weeks when FDP has been covered for a refresher.

Year 5 Curriculum Map

Sum 2 **3**	**Calculating problem solving with 4 ops** ·add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) ·add and subtract numbers mentally with increasingly large numbers ·use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy ·solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. ·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 1,000	Opportunity to practice calculating skills and combine operations, including word problems with more than one step. Lots of examples of 'working backwards' type problems e.g. I bought this and this, my change was £4.56, how much money did I start with? I multiply a number by 6, add 28 and then halve the result, the answer is 50, what did I start with? (THOANs – I Think Of A Number) Go beyond 'word problems' to non context problems / puzzles – use Testbase for inspiration of types of questions. Usual guidance on chn being systematic, thorough, using annotations, and various checking strategies. What do they need more practise in based on what they cannot do or what has not been covered yet: *Autumn & Spring review of 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.* *Add numbers with more than four digits (different amounts of digits and more than two numbers) using compact columnar addition* *Subtract numbers with more than four digit numbers using compact columnar subtraction* *Recognise and use the inverse relationship between + and - and use this to check calculations and solve missing number problems.* *Solve addition and subtraction multi-step problems in context, deciding which operations and methods to use and why.* *Autumn & Spring review of multiplication and division:* *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 and divide whole numbers and those involving decimals by 10, 100 and 1000.* *Multiply numbers up to 4 digits by one digit (short x) or two digits (long multiplication) using the formal written method.* *Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders.* *Recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3}).* *Solve problems involving multiplication and division using knowledge of factors and multiples, squares and cubes.* ***Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.*** Use measures as a useful context for scaling problems e.g. 'My jug holds three and a half times the capacity as yours.' **One of the best methods of visualising ratio problems is the bar model. Investigate this and use it!** Use money and time as a useful context for rates e.g. 'My phone bill costs 30p per minute…' Explore problems that require us to round up or down. Some children may be ready to explore fractions as whole numbers, decimal fractions and vulgar fractions but ensure they understand this. e .g. 435 ÷ 6 = 72.5 = 72 ½ = 72 r3 ***Solve problems involving addition, subtraction, multiplication and division and a combination of these , including understanding the meaning of =*** ***Solve two-step problems using all operations in contexts, deciding which operations and methods to use and why.*** ***Use all 4 operations to solve problems involving measure (length, mass, volume, money) using decimal notation, including scaling*** Provide lots of questions which require different approaches to be solved most efficiently. Use both mental (partition and add; add nearly numbers; partition and take away; subtract nearly numbers; find the difference on a number line to find change) and written methods to solve money problems. Have plenty of plastic money and measuring equipment! Use word problems and the contexts of measuring length, mass and capacity to solve problems. Be sure to use calculations which wouldn't be solved more efficiently mentally, and involve conversions. Estimate answers first using rounding and check with the inverse.

Year 5 Curriculum Map

Sum 2 **4** **5**	**Statistics** ·solve comparison, sum and difference problems using information presented in a line graph ·complete, read and interpret information in tables, including timetables. Counting in 10s 5s 20s 25s Finding missing numbers on scales and working out the intervals. Making and comparing numbers using digits cards and completing equations with digit cards to make statements correct.	Pupils connect their work on coordinates and scales to their interpretation of time graphs. They begin to decide which representations of data are most appropriate and why. Use and apply calculating and problem solving skills to interpret data. Emphasis on skills of being methodical and systematic when interpreting different data sources. Revise use of tables, pictograms, bar charts, time graphs. https://www.ncetm.org.uk/resources/42968 *Make sure scales are moving into the negative and children are able to solve problems using negative numbers – applying the skills taught earlier in the year* ***Interpret and present discrete and continuous data using bar charts, time line graphs, pictograms and tables.*** Remember to keep bars separate from each other. Make a transition from pictograms to bar charts. Use different scales. Make links with science and topic projects when presenting data. Use a ruler to find points on a line graph. Remember to explore a 'naked' graph with no labels and say what it *could* represent! ***Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.*** Relate the scales of bar charts to number lines. Draw on methods of + and – used in previous unit of work. *GARDEN*
Sum 2 **6**	**Geometry - Angles** ·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 ½ a turn (total 180°) - other multiples of 90° Count in steps of 5 or 10° until you reach a right angle. Use a squeaky voice for all acute angles then a low voice for obtuse angles. Show angles with hands Count in multiples of 90, linking to the 9 X table.	Remember angles are a measure of turn – how far something has turned about a set point. Link missing angles to similar missing number problems. https://www.ncetm.org.uk/resources/42849 ***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; angles at a point on a straight line and a ½ turn; other multiples of 90°*** Ensure understanding of a protractor and what is being measured i.e. The lines showing the angle could extend forever but the angle is the same size. Emphasise the steps of using a protractor – find the zero, and line it up on the point, choose a 'base line' and line this up with zero then observe whether you are using the 'inside' numbers or the 'outside' scale to measure this angle. Always see if this matches your estimate! Spot and measure angles at different orientations. Compare with obtuse or acute angles in quadrilaterals and other shapes.
Sum 2 **7**		Revision / Assessment (Can be fit in previous weeks if needed)