Year 5: Planning for Mastery

Autumn Term

Number and place value

Fractions including decimals

Measures and statistics included in practice activities

Spring Term

Addition and subtraction

Geometry

Recap of work covered so far

Measures and statistics included in practice activities

Summer Term

Multiplication and division

Recap of all work to ensure children ready for Year 6

Measures and statistics included in practice activities

Measurement and statistics to include in number work:

- 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
- 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 (cm^2) and square metres (m^2) and estimate the area of irregular shapes
- estimate volume [for example, using 1 cm^3 blocks to build cuboids (including cubes)] and capacity [for example, using water]
- solve problems involving converting between units of time
- use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling
- solve comparison, sum and difference problems using information presented in a line graph
- complete, read and interpret information in tables, including timetables

As part of starter activities count in steps of the multiplication tables that you want the children to rehearse, decimal and fraction (10th, 100th) steps, steps of powers of 10 and steps that help children with mental calculation strategies such as 20, 25, 50 and 75. Link to algebra – linear number sequences (15, 30, 45, 60, ? ?: n + 15 = m, what might n and m be?). It is also helpful to count in positive and negative integers across zero.

Telling the time on clocks, minutes past the hour linking to digital and then exploring how many minutes to the next hour.

Rehearse mental calculation strategies developed Years 1 to 4

Weeks are flexible: keep going until all children have mastered the area being taught

	Number and place value	**Fractions**
Autumn Term	Place Value: positional, multiplicative, additive, base 10. Teach the terms and use alongside teaching. Positional: where digit is placed, multiplicative: multiply the digit by its position to get true value, additive: add all the values together to get the whole number. Explore place value from thousandths to one million. Use partitioning cards, Dienes, Place value counters, place value grids and digit cards for this. Base 10: our number system increases and decreases in powers of 10. Practice multiplying/dividing by powers of 10 on Gettegno charts. Repeat with thousandths. Find 100 000/10 000/1000 more/less. Recap zero as place holder. Link to measurement- practical activities with length, mass, capacity, money. Ordering and comparing, greater than, less than, equals, rounding to nearest tenth, 1, 10, 100, 1000, 10 000 and 100 000. Ensure this is done with tenths, hundredths and thousandths as well as whole numbers. Kilometres and metres: 3km 450m = 3.45km. Kilograms and grams: 2kg 125g = 2.125kg and litres and millilitres. With money, the dot separates the pounds and pence. It should not be referred to as a decimal point because of the way we say money: £3.45, three pounds forty-five not three point four five pounds. Solving missing number problems and linking to algebra (use letters as well as text boxes), finding pairs of numbers that satisfy an equation with two unknowns, e.g. a + b = 360, a – 129 = b. How many solutions can children find? Negative numbers within the context of temperature using thermometers with different scales, land below sea level and money. Roman numeral investigation to 1000 – or leave until Year 6.	Fractions – whole part relationships (birds and faces), link to sharing model of division. Correct vocabulary: vinculum, denominator, numerator. Compare and order fractions with the same denominator and unit fractions with different denominators. Children should have mastered +/- of fractions with denominators in same family (halves, quarters and eighths and thirds, sixths and twelfths). Focus on finding common denominators to add/subtract more random fractions, e.g. 3/8 + 2/5 = 15/40 + 16/40 = 31/40. Ensure families of facts through commutativity and inverse are included: 2/5 + 3/8 = 31/40, 31/40 – 2/5 = 3/8, 31/40 – 3/8 = 2/5. When doing this include examples that are greater than one to rehearse changing improper fractions to mixed numbers and vice versa. Continue to explore fractions of numbers, quantities and shapes at the same time. Fractions are about area so show shapes with equal fractions that are not identical. Multiply fractions including mixed numbers by whole numbers very practically using repeated addition. Expect children to be able to make the generalisation that the numerator is multiplied by the whole number. Finding equivalent fractions using the generalisation explored in Years 3 and 4, include percentage and decimal equivalents e.g. ½ = 5/10 = 50/100 = 500/1000 = 0.5 = 50%. 1/5 = 2/10 = 20/100 = 200/1000 = 0.25 = 25%. Children will be familiar with percentages. Focus on finding percentages of numbers by finding 10% and playing around with it. Make links to measures. Problem solving **using bar model**.

	Addition and subtraction	**Geometric Reasoning**
	Vocabulary: augend add addend = sum, minuend subtract subtrahend = difference.	
Spring Term	Reinforce commutativity and inverse. Check addition using subtraction. Check subtraction using addition. Estimate answers first. Continue the development of mental calculation strategies from KS1 and Years 3 and 4. Focus on these strategies for two weeks or more. Mental calculation strategies to focus on (with jottings as appropriate): • Using number pairs for all numbers to 1/10 (hundredths), 1 (tenths), 10, 20 and 100 • Near doubles (1250 + 1260, 3214 + 3215) • Counting on and counting back • Bridging 10 (1376 + 1284 = 1380 + 1280 then 1400 + 1260) • Sequencing e.g. 2145 + 1132 = 2145 + 1000 + 100 + 30 + 2 = 3275 • Add/subtract near multiples of 10/100/100 by +/- the multiple and adjusting • Using known number facts, e.g. 105 + 114 = 119, 210 + 228 = 238 • Same difference, different calculation, 3263 – 2129 becomes 3264 - 2130 Children should have mastered addition and subtraction using the written methods by now. So focus on problem solving, adding and subtracting numbers with more than four digits and also decimals (tenths and hundredths) which is exactly the same process. Practice within the context of money, length, mass, capacity, volume, time differences and durations with 12- and 24-hour time; read and interpret timetables. Ensure practical opportunities when exploring measures. Include bar charts, tables and line graphs (finding totals and differences). Ensure opportunities for children to make their own. Include perimeter of rectangles and other shapes, using formula as appropriate; missing whole number problems linking to algebra. Encourage children to decide which methods to use for different calculations. When practicing the written methods, choose numbers that can't be efficiently calculated using a mental calculation strategy.	**3D shape:** 3D shape: using plasticine to make sphere, cube, cuboid, pyramid, exploring what doing to get each new shape and properties including naming face shapes. Use plasticine to make shapes and visualise net of pyramid, then cube, triangular and other prisms and pyramids. Explore which patterns make nets and which don't. Prism has named ends joined by rectangles. Pyramid has named face and triangular faces. Explore shapes in different orientations. Identify 3-D shapes from 2-D representations, e.g. circle could be sphere, cylinder, cone. Square could be cube, cuboid, square based pyramid, any prism. Sort into Venn and Carroll diagrams: whether polyhedral or not, whether prism or not, whether pyramid or not. **2D shape:** compare, classify and draw regular and irregular shapes according to properties, including symmetry and angles (acute, right, obtuse and reflex). Recap names of quadrilaterals (rectangle, square, oblong, parallelogram, rhombus, trapezium, kite). Children draw different types. Rectangles have 4 right angles: oblongs and squares. Explore properties including vertical, horizontal, diagonal, parallel, perpendicular sides, angles and symmetry. Kites have two adjacent equal sides, at least on pair of opposite angles equal and diagonals bisect at right angles. Which shapes are rhombi, kites and parallelograms? (squares). Use knowledge to find missing lengths and angles. Explore properties (as above) of named triangles (equilateral, right angled isosceles, isosceles, right angled scalene, scalene). Find perimeters and areas. Sorting activities including Venn and Carroll diagrams. Focus on measuring and identifying angles including whole, half, quarter turns **Position direction and movement:** reinforce positions on a 2-D grid as coordinates in the first quadrant. Describe movements between positions as translations of a given unit to the left/right and up/down including those on a coordinate grid. Explore reflections where lines are parallel to the axes.

	Multiplication and division Vocabulary: multiplicand multiplied by multiplier = product, dividend divided by divisor = quotient	**Assessment**
Summer Term	Spend at least 2 weeks on mental calculation. Mental calculation strategies: - Tables facts for all numbers to 12 x 12. Counting in steps and learn the facts. Lots of chanting. - Use known facts to generate others, e.g. 6 x 9 = 54, 60 x 9 = 540, 60 x 4.5 = 270, commutative and inverse facts, multiplying and dividing by 10, 100 and 1000, halving, doubling - Doubling and halving - Multiplying by 5 by multiplying by 10 and halving, dividing by 5 by dividing by 10 and doubling - Multiplying by 20 by multiplying by 10 and doubling, dividing by 20 by dividing by 10 and halving - Multiplying by 15, by multiplying by 10, halve it and add the two Practice in different contexts, e.g. converting units of measurements. Link in with finding areas and solid volumes and exploring the formulae for these – practically on squared paper and using interlocking cubes. Create time/distance line graphs where scale goes up in multiples the children need to practice. Missing number problems linking to algebra. Explore common factors, multiples, prime numbers, prime factors, non-composite (not prime) numbers. Children should have mastered formal written methods by now. New focus for Year 5 is long multiplication. Do this initially using dotty arrays and the grid method. Link to commutativity and inverse. Check using multiplication (with a calculator). **Scaling up and scaling down:** link to ratio. Include measurement contexts. Bar model problems, e.g. Sam had 23 cars, Tom had 5 times as many. How many more did Tom have?	Last half term: reinforcement and consolidation of key concepts studied so far, so that children have mastered Year 5 curriculum and are ready for Year 6. Check NC requirements for Year 5 to ensure everything has been covered especially measurement and statistics.