Year 4: 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 5

Measures and statistics included in practice activities

Measurement and statistics to include in number work:

- Convert between different units of measure [for example, kilometre to metre; hour to minute] MULTIPLICATION, DIVISION, PLACE VALUE
- measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres ADDITION, SUBTRACTION
- find the area of rectilinear shapes by counting squares MULTIPLICATION, DIVISION, GEOMETRY
- estimate, compare and calculate different measures, including money in pounds and pence ALL 4 OPERATIONS
- read, write and convert time between analogue and digital 12- and 24-hour clocks STAND ALONE AS WELL AS ADDITION AND SUBTRACTION
- solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days ALL 4 OPERATIONS
- interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs ALL 4 OPERATIONS
- solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs ALL 4 OPERATIONS

As part of starter activities count in steps of 6, 7, 9, 25 and 1 000 and also other multiplication tables that you want the children to rehearse, decimal and fraction steps (½, ¼, $^1/_3$, 10th and hundredths) and steps that help children with mental calculation strategies such as 20, 25, 50 and 75. Link to linear number sequences (20, 30, 40, ?, ?: n+20)

It is also helpful to count in positive and negative integers across zero.

Several times a week work on telling the time with clocks (analogue and digital) and find time durations and differences

Rehearse mental calculation strategies developed Years 1, 2 and 3

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 hundredths to 10 000. 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 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 1, 10, 100, 1000. Ensure this is done with tenths and hundredths as well as whole numbers. Centimetres and millimetres: 3cm 4mm = 3.4cm. Metres and centimetres: 2m 56cm = 2.56m. 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 3.45 three point four five of a pound. 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. Spend short amount of time on a Roman numeral investigation to 100 (or leave until Year 6).	Fractions – whole part relationships (birds and faces), link to sharing model of division. Correct vocabulary: vinculum, denominator, numerator. Focus on halves, quarters and eighths and thirds, sixths and twelfths. Take each fraction one at a time and explore that fraction of numbers, quantities and shapes at the same time. Fractions are about area so show shapes have fractions that are not identical. Recap adding and subtracting fractions with the same denominator (those listed above). Look at equivalences between one whole, halves, quarters and eighths using fraction walls for these fractions only. Begin addition and subtraction using the walls or similar: ½ + 3/8 = 4/8 + 3/8 = 7/8. If I know ½ + 3/8 = 7/8 what else do I know? Commutative and inverse facts. Then move onto thirds, sixths and twelfths, then fifths and tenths. Children should be encouraged to add and subtract of fractions within the same 'families' using appropriate visuals. Addition needs to have sums greater than one. Subtraction minuends should be mixed numbers. Work on mixed numbers and improper fractions and explore the generalisation. Simple equivalent fractions and tenths and hundredths including ½ = 5/10 = 50/100 = 0.5, 1/10 = 10/100 = 0.1. Link hundredths to percentages (one out of 100). Children will be familiar with these. Convert hundredths to %. 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		Continue the development of mental calculation strategies from KS1. Reinforce commutativity and inverse through the bar model. Check addition using subtraction. Check subtraction using addition. 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 (tenths), 10, 20 and 100 • Near doubles (125 + 126, 314 + 315) • Counting on and counting back • Bridging 10 (1376 + 1284 = 1380 + 1280 then 1400 + 1260) • Sequencing e.g. 145 + 132 = 145 + 100 + 30 + 2 = 277 • Add/subtract near multiples of 10/100 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 Include: adding and subtracting 4 and 5-digit numbers. Extend to tenths. Add variation by using patterns of similar calculations, e.g. 200 – 145, 300 – 145 Estimate answers and check using commutative and inverse. Practice within the context of money, length, mass, volume, time differences and durations with 12- and 24-hour time; bar charts; perimeter of rectangles and other shapes, developing its formula; missing whole number problems linking to algebra. Encourage children to decide which methods to use for different calculations. When teaching 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 ends joined by rectangles. Pyramid has named face and triangular faces. Explore shapes in different orientations. Sorting activities including Venn and Carroll diagrams. Sort shapes according to whether polyhedral or not, whether prism or not, whether pyramid or not. **2D shape:** compare, classify and draw shapes according to properties, including symmetry and angles (acute, right, obtuse and reflex). Introduce 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. Find perimeters and areas of rectangles and other rectilinear shapes. Find areas of rectangles by multiplication and others by counting squares. Explore properties (as above) of named triangles (equilateral, right angled isosceles, isosceles, right angled scalene, scalene). Sorting activities including Venn and Carroll diagrams. Explore symmetry in real life and complete symmetric figures with specific lines of symmetry **Position direction and movement:** describe positions on a 2-D grid as coordinates in the first quadrant. Describe movements between positions as translations of a given unit to the left/right and up/down Plot specified points and draw sides to complete a given polygon.
		Last week or two of term: assessment or reinforcement and consolidation of key concepts studied so far. If necessary, make a note of areas that need more work and build these into the last half of the summer term	

	Multiplication and division	**Assessment**
	Vocabulary: multiplicand multiplied by multiplier = product, dividend divided by divisor = quotient	
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 clock idea. Use these 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 • Count in steps of 6, 12, 7, 9 and work on tables facts. 6: double 3, 12: double 6, x7: x2 add x5, 9: x4 add x5 • Doubling and halving • Multiplying by 5 by multiplying by 10 and halving, dividing by 5 by dividing by 10 and doubling Practice in different contexts, for example, converting units of time e.g. 2 hours = 120 mins and other measurements, e.g. 3m = 300cm. Also include common factors and multiples and finding pairs of numbers that satisfy an equation with two unknowns, e.g. a x 12 = b, a x b = 48. Statistics-pictograms and bar graphs with symbols and divisions in multiples of 2, 4 and 8 etc. Multiply and divide by tables facts children struggle to recall. Recap arrays and the grid method. Work towards the written method for multiplying 2- and 3- digit numbers by one. They must master this by the end of Year 4. Check using division (with calculator). Link to commutativity and inverse, for example, 76 x 3 = 228 so 228 ÷ 76 = 3 and 228 ÷ 3 = 76. Use Dienes and place value counters for division, modelling written method: 2- and 3-digit numbers by single. They find how many groups of the divisor can be made from the dividend, include remainders as fractions (part of a group of the divisor). Check using multiplication (with a calculator). Children need to master this by end of Year 4. **Scaling up and scaling down:** link to doubling and fractions. Work within the context of measure – 7 times as much, 1/9 of the size, 3 times as many etc. Link to ratio. Select those measures that have been covered less often than others. Problem solving, e.g. for every 3 marbles Suzie makes, Freddy has 4. If Suzie has 21 marbles how many does Freddy have? Use counters and the bar model for this.	Last half term: reinforcement and consolidation of key concepts studied so far, so that children have mastered Year 4 curriculum and are ready for Year 5. Check NC requirements for Year 4 to ensure everything has been covered especially measurement and statistics.