Year 3: 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 4

Measures and statistics included in practice activities

Measurement and statistics to include in number work:

- measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) ADDITION AND SUBTRACTION
- measure the perimeter of simple 2-D shapes ADDITION AND SUBTRACTION, GEOMETRY
- add and subtract amounts of money to give change, using both £ and p in practical contexts ADDITION AND SUBTRACTION
- tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks STAND ALONE LESSONS
- estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight STAND ALONE LESSONS
- know the number of seconds in a minute and the number of days in each month, year and leap year STARTERS
- compare durations of events [for example to calculate the time taken by particular events or tasks]. ADDITION AND SUBTRACTION
- interpret and present data using bar charts, pictograms and tables ALL 4 OPERATIONS
- solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables ALL 4 OPERATIONS

As part of starter activities count in steps of 4 and 8 forwards and backwards from and to 0 and also other multiplication tables that you want the children to rehearse. Link these to multiplication and division facts. Count in fraction and decimal steps e.g. ½, ¼, $^1/_3$, tenths and the decimal equivalent 0.1 and steps that help children with mental calculation strategies such as 50 and 100. Count in positive and negative integers across zero.

Use known facts to generate others by scaling up and down, e.g. 1 hour = 60 minutes, 2 hours = 120 minutes, 4 hours = 240 minutes, 6 hours = 2 hrs + 4 hrs

Several times a week work on telling the time with clocks and link to digital time and Roman numeral clocks (or leave Roman numeral clocks until Year 6).

Rehearse mental calculation strategies developed Years 1 and 2

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 tenths to 1000. Use partitioning cards, 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.
Recap zero as place holder. Repeat with hundredths.
Link to measurement- practical activities with length, mass, capacity, money.
Ordering and comparing numbers up to 1000. Greater than, less than, equals, rounding. Ensure this is done with tenths 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 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 = 148, a – 36 = b. How many solutions can children find?
Negative numbers within the context of temperature using thermometers with different scales.	Fractions – whole part relationships (birds and faces), link to sharing model of division. Correct vocabulary: vinculum, denominator, numerator.
Focus on halves, quarters and eighths. Take each fraction one at a time and explore that fraction of numbers, quantities and shapes at the same time. Link fractions to area. Shapes should have parts that are the same fraction but that look different.
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. Explore the generalisation for finding equivalent fractions.
Compare and order unit fractions and fractions with the same denominator.
Children should be encouraged to add and subtract of fractions within the same 'families' using appropriate visuals.
Simple equivalent fractions and tenths including ½ = 5/10 = 0.5, 1/10 = 0.1.
Counting in fractional steps and link this to improper fractions and mixed numbers – e.g. ½, 1, 1 ½, 2, 2 ½, how many halves? 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 20 and then 100 • Near doubles (125 + 126, 314 + 315) • Counting on and counting back • Bridging 10 (137 + 128 = 140 + 125 or 135 + 130) • 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, 274 – 169 becomes 275 - 170 Include: a three-digit number and ones, a three-digit number and tens, a three-digit number and hundreds. Also extend to other numbers. Add variation by using patterns of similar calculations, e.g. 245 + 100, 245 + 200. Practice in contexts of money, length, mass, volume, capacity, time differences and durations with 12- and 24-hour time; bar charts; perimeter of rectangles, 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. Build on from end of Year 2, with 3-digit expanded addition. 67 + 54 (summer Year 2) $$67 + 54:\quad \begin{array}{r} 67 \\ + 54 \\ \hline 110 \\ 11 \\ \hline 121 \end{array}$$ $$\begin{array}{r} 267 \\ +254 \\ \hline 400 \\ 110 \\ 11 \\ \hline 521 \end{array}$$ Explore missing expanded part: $$\begin{array}{r} 267 \\ +254 \\ \hline 41111 \end{array}$$ Discuss what is wrong (no exchange) and lead into formal method from least significant digit. 3-digit subtraction to be covered subtracting least significant digit first.	**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 prism, cuboid etc. Explore which patterns make nets and which don't. Explore shapes in different orientations. Sorting activities including Venn and Carroll diagrams. Sort shapes according to whether polyhedral or not, whether prism (ends joined by rectangles) or not, whether pyramid (named base and triangular faces) or not. Important to get definitions of prisms and pyramids correct. **2D shape:** compare, classify and draw shapes according to properties, including symmetry and angles. Include triangles, pentagons, hexagons, octagons, etc. Know that a polygon is a shape with 3 or more sides. Introduce quadrilaterals as 4 sided shapes. Children draw different types. Rectangles have 4 right angles: oblongs and squares. Look at properties in terms of vertical, horizontal, diagonal, perpendicular and parallel. Find perimeters of rectangles and other rectilinear and 2D-shapes explored. Sorting activities including Venn and Carroll diagrams. Introduce acute and obtuse angles. When noticing angles that are greater than a straight-line use term reflex. **Position direction and movement:** Using vocabulary to describe position and direction. Practical activities to explore movement in a straight line and in different directions. Practical exploration of rotation as a turn in terms of right angles. Link to fractions, time. Identifying right angles in the environment and recognise: 1 right angle is ¼ turn of 90°. Look at protractors and identify 90^{0}. Use scale as a number line – take finger for a walk. Link to Kandinsky. 2 right angles are ½ turn of 180° and 3 are ¾ turn of 270°. Look at these on a protractor. What is a whole turn?
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 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 1x, 2x, 5x and 10x. Counting in steps and learn the facts. Lots of chanting. Use clock idea. Use these facts to generate others, e.g. 6 x 5 = 30, commutative and inverse facts, multiplying and dividing by 10 and 100, halving doubling • Count in steps of 4, 8, 3 and work on tables facts. 4: double 2, 8: double 4 • Doubling and halving • Multiplying by 5 by multiplying by 10 and halving 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. Work towards mastering the grid method for multiplication. Make arrays using Dienes and place value counters for 2-digit multiplication by single digit and model grid method. Check using division (with calculator) linking to the array, for example, 76 x 3 = 228 so 228 ÷ 76 = 3 and 228 ÷ 3 = 76. Model the written method alongside the grid. Expect children to master arrays and the grid by the end of Year 3, not necessarily the written method. Use Dienes and place value counters for division, finding 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). **Scaling up and scaling down:** link to doubling and fractions. Work within the context of measure – 4 times as much, 1/5 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 £2 pounds Jenny has, Freddy £3. If Jenny has £12 much do they have altogether. 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 3 curriculum and are ready for Year 4. Check NC requirements for Year 3 to ensure everything has been covered especially measurement and statistics.