

Year 2: Planning for Mastery

Autumn Term

Number and place value

Fractions

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 3

Measures and statistics included in practice activities

Measurement and statistics to include in number work:

- choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature ($^{\circ}\text{C}$); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels
- compare and order lengths, mass, volume/capacity and record the results using $>$, $<$ and $=$
- recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value
- find different combinations of coins that equal the same amounts of money
- solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change
- compare and sequence intervals of time
- tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times
- know the number of minutes in an hour and the number of hours in a day
- interpret and construct simple pictograms, tally charts, block diagrams and simple tables (Venn and Carroll diagrams for shape)
- ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity
- ask and answer questions about totalling and comparing categorical data

As part of starter activities count in steps of 2, 3 and 5 forwards and backwards from and to zero and 10s from any number and fraction steps e.g. $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{3}$ and steps that help children with mental calculation strategies such as 50 and 100.

Link to linear number sequences e.g. 3, 6, 9, ?, ? and 20, 30, 40, ?, ?

Several times a week work on telling the time with clocks and rehearsing mental calculation strategies.

With time focus on minutes past and relate to 5x table: 10 minutes past, 40 minutes past etc. and link to digital time 3:10, 3:40, finding these times on a clock face. Investigating how many minutes until the next hour. Minutes in an hour/2 hours/3/4 and hours in a day/2 days/3/4 etc.

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

	Number and place value	Fractions
Autumn Term	<p>Place Value: positional, multiplicative, additive, base 10. Children need to understand that, e.g. with 356, the 3 is positioned in the 100s, the 5 is positioned in the 10s and 6 is positioned in the 1s. 3 is multiplied by 100 to give its true value of 300, 5 is multiplied by 10 and 6 is multiplied by 1. These values are added to give the whole number: $300 + 50 + 6 = 356$. Children need to understand that when we multiply or divide a number by 10 it becomes 10 times greater or smaller. Introduce 100 in place value because they have been dealing with tens and ones since Year R. Lots of practice using place value grids and digit cards, partitioning cards and Gettegno charts. Revisit zero as place holder.</p> <p>Represent numbers in different ways including with Dienes, coloured counters, cubes, money (£1, 10p and 1p coins), on a number line and 100 square, 100 grid.</p> <p>Ordering and comparing, Greater than, less than, equals (using symbols as described in plan), rounding. Reinforce equals as same as and equivalent to. 10 /100 more / less.</p> <p>Link to measurement- practical activities with money, length (1m, 10cm, 1cm), mass (kg and multiples of 100g), volume and capacity (litres and multiples of 100ml), time, temperature.</p> <p>Solving missing number problems and linking to algebra (use letters as well as boxes)</p>	<p>Fractions – whole part relationships (birds and faces), link to sharing model of division. Correct vocabulary: vinculum, denominator, numerator.</p> <p>Focus on halves and quarters. Take each fraction one at a time and explore that fraction of measurement, numbers, quantities and shapes at the same time. Recap area and show shapes that have fractions of the same area that are not identical.</p> <p>Addition and subtraction of halves, quarters and eighths (using coloured cards), include commutativity and inverse, e.g. $\frac{1}{2} + \frac{1}{4} = \frac{3}{4}$, $\frac{1}{4} + \frac{1}{2} = \frac{3}{4}$, $\frac{3}{4} - \frac{1}{2} = \frac{1}{4}$, $\frac{3}{4} - \frac{1}{4} = \frac{1}{2}$.</p> <p>Look at equivalences between halves, and quarters.</p> <p>Focus on thirds as with halves and quarters.</p> <p>Ensure they understand that the denominator shows the number of parts the whole has been shared into and then link to other fractions. What if the denominator is 5, 6, 7 etc? Build different fractions using cubes e.g. $\frac{2}{5}$ red, $\frac{3}{5}$ yellow. What addition and subtraction statements can they make? Reinforce commutativity and inverse: $\frac{2}{5} + \frac{3}{5} = 1$, $\frac{3}{5} + \frac{2}{5} = 1$, $1 - \frac{2}{5} = \frac{3}{5}$, $1 - \frac{3}{5} = \frac{2}{5}$. Repeat for other denominators.</p> <p>Compare and order unit fractions and fractions with the same denominator.</p> <p>Problem solving using bar model throughout.</p>

	<p style="text-align: center;">Addition and subtraction</p> <p>Vocabulary: augend add addend = sum, minuend subtract subtrahend = difference.</p>	<p style="text-align: center;">Geometric Reasoning</p>
<p>Spring Term</p>	<p>Continue the development of mental calculation strategies from Year 1 when teaching addition and subtraction. Link addition and subtraction by doing both together. Reinforce commutativity and inverse.</p> <p>Consolidate addition and subtraction number facts for all numbers to 20 and then 100. Focus on: a two-digit number and ones, a two-digit number and tens, two two-digit numbers, adding three one-digit numbers. Add variation using patterns of similar calculations, e.g. $24 + 13 = 37$, $24 + 14 = 38$, $24 + 15 = 39$</p> <p>Use Numicon, Dienes, cubes, counters. Build it, draw it, talk about it and write the number statement.</p> <p>Find out which strategies Year 1 have covered and teach the others. Reinforce and consolidate those from Year 1.</p> <ul style="list-style-type: none"> • YEAR 1 Number pairs for all numbers to 20 and then 100. Use, for example, Dienes. Children make and record commutative and inverse number statements. • YEAR 1 Doubling, halving, near doubles ($13 + 14$, $25 + 26$) • YEAR 1 Counting on and counting back, e.g. time differences and durations in whole hours and 5 minute intervals. • YEAR 1 Bridging 10 with Dienes and 100 square grids (e.g. $37 + 28 = 40 + 25 = 65$) • YEAR 1 Sequencing e.g. $45 + 32$ by adding 30 then 2 • YEAR 2 Adding / subtracting 9 / 11 / 8 / 12 by adding 10 and adjusting • YEAR 2 Using known number facts, e.g. $25 + 14 = 39$, $35 + 14 = 49$, $50 + 28 = 78$ • YEAR 1 Same difference, different calculation, $64 - 52$ becomes $62 - 50$, difference of 12 <p>Reinforce the bar model and circle model to show relationship between addition and subtraction (family of facts). Commutativity, e.g. $13 + 14 = 14 + 13$, same answer different calculation. Subtraction not commutative – prove it. Check addition using subtraction. Check subtraction using addition.</p> <p>Missing number problems $43 = ? + 19$, $28 = ? - 19$.</p> <p>Practice finding totals and differences within context of money, length, mass, capacity, volume, temperature and time.</p>	<p>3D shape: using plasticine make sphere (curved surface), cube, cuboid, exploring what they are doing to get each new shape. Discuss their properties including naming and describing faces for cubes and cuboids.</p> <p>Explore non-polyhedral shapes: spheres, hemispheres, cones, cylinders and polyhedral shapes: pyramids and prisms exploring their properties. Pyramids have base and at least another three triangular faces. Prisms have ends that are joined by rectangles. Cones have a face, curved surface and apex. Make a variety of pyramids and prisms using polydron type equipment.</p> <p>Using a cuboid, cube, pyramid or triangular prism, give opportunities to make one out of card.</p> <p>Sorting activities including Venn and Carroll diagrams</p> <p>2D shape: use drawings on paper. Begin with three sided shapes, all are triangles. Look at equilateral triangle as regular. Repeat this for quadrilaterals, and then focus on rectangles: four sides and four right angles. Square is regular, oblong is irregular. Repeat for pentagons and hexagons.</p> <p>Plenty of pattern making and sorting (include circles)</p> <p>Explore symmetry on different 2D regular and irregular shapes. Making symmetrical patterns across horizontal, vertical and diagonal mirror lines. Numicon is good for this. Identify right angles in the environment and on the shapes they have explored. Find perimeters of rectangles.</p> <p>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.</p>
<p>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</p>		

	<p style="text-align: center;">Multiplication and division</p> <p>Vocabulary: multiplicand multiplied by multiplier = product, dividend divided by divisor = quotient</p>	<p style="text-align: center;">Assessment</p>
<p>Summer Term</p>	<p>Mental calculation strategies:</p> <ul style="list-style-type: none"> • 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. $6 \times 5 = 30$, commutative and inverse facts, multiplying by 10 and 100, halving doubling • Count ins steps of 3 and work on tables facts • Doubling and halving • Multiplying and dividing by 10 • Multiplying by 5 by multiplying by 10 and halving <p>Explore multiplication and division together using arrays on dot paper and using counters. Link to repeated additions and repeated subtraction. Reinforce that multiplication is commutative, division is not (prove it) and that they are inverse operations.</p> <p>Focus on single digit x single digit arrays. Check with division (grouping model). Look at both ways to multiply: how many rows, (e.g. 6), how many columns, (e.g. 5)? $6 \times 5 = 30$, how many columns, how many rows? $5 \times 6 = 30$.</p> <p>Give children different numbers of counters and ask them to make all the arrays that they can. Each time they explore arrays, they write the four facts for each one made. For multiplication use ones cubes and pennies, exchanging ten ones for a ten. Record horizontally. Link to pictograms where symbols represent different multipliers.</p> <p>Scaling up and scaling down: link to doubling and fractions. Work within the context of measure – half as much, 4 times as much, a quarter of the size, 3 times as many etc. Select those measures that have been covered less often than others. Problem solving, e.g. for every three cars Bobby has, Freddy has 5. If Bobby has 12 cars how many does Freddy have. Use counters and the bar model for this.</p> <p>Odd and even numbers: explore using Numicon, odd number is an even number + one. Explore what happens when you add two even numbers, two odd numbers, an even and an odd number. Explore multiplying an even and then an odd number by 2, 5 and 10. Can they make any generalisations?</p> <p>Sharing model for division: link to fractions and scaling up and scaling down within the context of problem solving measures.</p>	<p>Last half term: reinforcement and consolidation of key concepts studied so far, so that children have mastered Year 2 curriculum and are ready for Year 3. Check NC requirements for Year 2 to ensure everything has been covered especially measurement and statistics.</p> <p>Include a week on addition using the expanded written method to prepare the children for their progression to the written method in Year 3.</p> <div style="text-align: center; margin: 20px 0;"> $\begin{array}{r} 67 + 54 \qquad 67 \\ + 54 \\ \hline 110 \\ + 11 \\ \hline 121 \end{array}$ </div> <p>Also, spend a few weeks adding and subtracting fractions with the same denominators, for example, thirds, fifths, sixths, eighths as described in the fractions section. It is important that children master this before they start Year 3.</p>

