Mathematics Journey Planner: Year 3

OVERVIEW & BIG IDEAS					
AUTUMN		**SPRING**		**SUMMER**	
3 weeks	**The Number System: Whole numbers to 1,000** The value of a digit is determined by its position in a number. Place value must be explored in terms of the value of each digit and its overall value, as well as its position relative to other numbers.	**2 weeks**	**The Number System: Whole numbers to 1,000** The value of a digit is determined by its position in a number. Place value must be explored in terms of the value of each digit and its overall value, as well as its position relative to other numbers.	**2 weeks**	**The Number System: Whole numbers to 1,000** The value of a digit is determined by its position in a number. Place value must be explored in terms of the value of each digit and its overall value, as well as its position relative to other numbers.
3 weeks	**Calculating, Patterns & Algebra + and –** Calculate don't count on in ones! The big idea is using a whole-part model to picture addition and subtraction. Relate numbers to their parts (partitioning) and to multiples of 10 to bridge multiples of ten. E.g. 8 + 7 = 8 + 2 + 5 15 – 8 should be tackled by thinking what needs to be added to 8 to make 15. This is the concept of 'difference'. Drawing bar models will help to picture which operation to do. This should then be applied when calculating with larger numbers.	**3 weeks**	**Calculating, Patterns & Algebra + and –** Calculate don't count on in ones! Use whole-part and relationships to see how numbers relate to each other. This is how the inverse is explored. Drawing bar models will help to picture which operation to do. Mental methods of subtraction (finding the difference) should be used when most efficient. During this unit of work, decomposition subtraction (take away) is introduced. The big idea here is that numbers can be partitioned in different ways.	**3 weeks**	**Calculating, Patterns & Algebra + and –** Calculate don't count on in ones! Use whole-part and relationships to see how numbers relate to each other. This is how the inverse is explored. Drawing bar models will help to picture which operation to do. Mental methods of subtraction (finding the difference) should be used when most efficient. During this unit of work, change is found when subtracting amounts of money. Often, 'find the difference' is the most efficient strategy.
1 week	**Geometry & Measures** Children can develop benchmarks to help them to estimate measures. E.g. The height of a door, the weight of a bag of sugar etc.. The big idea in geometry is that relationships – connections – are made between shapes. They can be regular or irregular and can be categorised according to their properties including vertices and side lengths.	**3 weeks**	**Calculating, Patterns & Algebra: X and ÷** The big idea explored in this unit of work is one of scaling: When we multiply by 10, the product is 10 times larger. This understanding is the basis for grid method and formal multiplication. The distributive law is also important as children explore how numbers are partitioned, multiplied and recombined. Multiplication and division's inverse relationship is the basis of solving division problems and finding remainders.	**3 weeks**	**Calculating, Patterns & Algebra: X and ÷** The big idea explored in this unit of work is one of scaling: When we multiply by 10, the product is 10 times larger. This understanding is the basis for grid method and formal multiplication. The distributive law is also important as children explore how numbers are partitioned, multiplied and recombined. Multiplication and division's inverse relationship is the basis of solving division problems and finding remainders.
2 weeks	**The Number System: Fractions *as* numbers** Fractions are numbers! You can count in fractions just like numbers. They express equal parts of a whole. Equal parts of shapes do not need to be congruent but need to be equal in area.	**2 weeks**	**The Number System: fractions *of* numbers** Fractions are equal parts of a whole and you can find fractional parts of a number. This whole can be an amount or a number. We can find fractions of numbers.	**2 weeks**	**Measures Time** Time is measured different units/bases from what we are used to with metric measures. There are 60 seconds in a minute, 60 minutes in an hour, 24 hours in a day etc.. Therefore children need to use number lines to help them efficiently calculate time differences.
3 weeks	**Calculating, Patterns & Algebra X and Division** Multiplication is related to times tables as repeated addition. The big idea is one of 'unitisation' where children count in 'groups of' a number. Division can be seen as 'how many groups of'. The inverse relationship will also be explored through arrays.	**2 weeks**	**Geometry Angles & properties of shape** Angles are measure of a turn and the lengths of lines used to show the angle do not change its size. Shapes can be regular or irregular and can be categorised according to their properties.	**2 weeks**	**The Number System: fractions as numbers** Fractions are equal parts of a whole which you can count in! Equal parts of shapes do not need to be congruent but need to be equal in area. The other big idea introduced in this unit of work is that our number system is base 10 and decimal fractions 0.1 are linked to other fractions.
1 week	**Statistics** Data is collected with a purpose in mind and can be represented in different ways.				

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To be used as a basis for unit planning, combined with the calculation or progression policy. Each unit of work should include several problem solving lessons. NRICH is a great resource for this and has problems mapped to the curriculum here. NCETM progression maps are useful for dialling it back for children working below Y3 levels. NCETM mastery assessment document is wonderful for deepening. ***Remember the aims of the National Curriculum are: fluency, reasoning and problem solving!***			
Timing		**Fluency**	**Destinations for reaching expected Y3 level** with teaching notes.
AUTUMN	3 WEEKS	Y2 review: count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward Y2 review: recognise the place value of each digit in a two-digit number (tens, ones) Halving (this supports number line work by estimating where half way is)	**The Number System: Whole numbers to 1,000** ***Read and write numbers up to 1,000 in numerals and in words*** Noting the pattern of three digits and commas. ***Recognise the place value of each digit in a three-digit number (hundreds, tens, ones) – the significance of the position of each digit to its value/size*** Partitioning (review teens numbers as ten and ones) Use Numicon, base 10 and then place value counters. Making numbers using digits cards Explore questions such as 'how many ones in 80?' 'How many tens in 800?' to deepen understanding! ***Compare and order numbers up to 1,000 – numbers in relation to each other*** Placing on a number line and finding nearest multiples of 10, 100 etc. Beginning rounding and estimating. Explore the idea of = as equivalence and balance using empty box partitions

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Timing		Fluency & Key Maths	Destinations for reaching expected Y3 level with teaching notes.
AUTUMN	3 WEEKS	KS1 review: mental addition strategies without counting on! Calculate don't count: -Quick adds e.g. 20 + 7 then 23 + 6 'because I know 3 + 6 = 9' -Partitioning single digit numbers in different ways to bridge 10 e.g. 27 + 5 = 27 + 3 + 2 - Add multiples of 10 and nearly numbers like 19 by spider counting and adjusting. -Adding strings of numbers by making bonds or finding doubles. Reinforce law of commutativity for + so we don't have to do it from left to right! Play games such as Shall I risk it? Totality and Don't roll a 6! Find rules and missing numbers in additive sequences.	**Calculating, Patterns & Algebra + and –** ***Add and subtract numbers mentally (take away not find the difference), with and without bridging including:*** a three-digit number and ones; a three-digit number and tens; a three-digit number and hundreds Write calculations horizontally and tell children to assess whether mental methods will be quick and efficient. Solve word problems that require mental addition and subtraction using strategies taught. Use base 10, place value counters. Explore the different strategies in the fluency column. Model explicitly! ***Add three digit numbers using expanded then compact columnar addition*** Use base 10, then place value counters and show expanded and compact next to each other to see links. Solve word problems that require written addition. Estimate answers first using rounding and check with the inverse. ***Subtract using informal mental methods – finding the difference*** Begin slowly with the concept of difference. E.g. which numbers have a difference of 1, 2, 5 or 10? Use Numicon to show 'difference' Find the difference on a number line by counting up. NB numbers should not be far apart or lend themselves better to 'take away' Solve word problems that require 'find the difference'. Estimate answers first using rounding and check with the inverse. ***Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.*** Write calculations in different ways e.g. 23 = ? + 12 ; 43 + 25 = ? – 8; and 12 + 15 < ? – 2 Use bar models to show whole part-part inverse relationships.
AUTUMN	1 WEEK	Doubling Multiplying by 10 (beginning of conversions)	**Geometry & Measures** *Review Y2: name 2 d shapes, (include examples which are regular and irregular and at different orientations)* ***Measure, compare, add and subtract lengths (m/cm/mm);*** Use rulers and meter rules, discussing the different units of measurement. ***Measure the perimeter of simple 2-D shapes***

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Pace		Fluency	Destinations for reaching expected Y3 level with teaching notes.
AUTUMN	2 WEEKS	Review from Year 2: Count in fractions up to 10, starting from any number and using the1/2 and 2/4 equivalence on the number line Use a counting stick to count in 1/4s beyond 1 whole! Discuss equivalence… how else could we say 2/4? Find rules and missing fractions in sequences.	**The Number System: Fractions *as* numbers** *Year 2 review: Finding equal pieces and recognising what is ½ what is ¼ etc.* Explore equal and unequal pieces. Find fractions of shapes linking to equivalence e.g. If you have 3/6 shaded on a shape, this is the same as ½ Explore the idea that fractional pieces must have the same area but don't need to be congruent. ***Compare and order unit fractions, and fractions with the same denominators*** Review from Year 2: Pupils should count in fractions up to 10, starting from any number and using the1/2 and 2/4 equivalence on the number line. Work on understanding what the denominator is…. Equal parts of a whole. Work in the ½ ¼ 1/8 family. Consider 1/8 and how it is smaller than ¼. Try paper folding and building a fraction wall for this family. Work on understanding what the numerator is. Look at equivalence. Add and subtract fractions in the same family. Use fraction cards. https://www.ncetm.org.uk/resources/43609 Solve pictorial problems and very simple word problems involving fractions.

<table>
<tr><td rowspan="2">AUTUMN</td><td rowspan="2">3 WEEKS</td><td>KS1 review: doubling and halving by partitioning

Step counting in multiples of 4
Chanting 2s, 5s and 10s.

Find rules and missing numbers in sequences.</td><td>Calculating, Patterns & Algebra X and Division
Recall and use multiplication and division facts for the 4x table
Make links with doubling and doubling again. Make links with properties of even numbers.
Investigate patterns with multiples of 4,
Create arrays for multiples of 4… show inverse relationship and write X and division facts. Use bar models to show the same relationships. Use Cuisenaire rods to show ‘how many 4s make 24’.
Show counting in groups of 4 on a number line.
Solve word problems that relate to multiplying by 4 (additive and scaling problems)

Recall and use multiplication and division facts for the 8x table.
Make links with doubling and doubling again. Make links with properties of even numbers.
Investigate patterns with multiples of 8,
Create arrays for multiples of 8… show inverse relationship and write X and division facts. Use bar models to show the same relationships. Use Cuisenaire rods to show ‘how many 8s make 24’ and show alongside counting in groups of 8 on a number line.
Investigate remainders using arrays or number lines. E.g. 33 ÷ 8…
Solve word problems that relate to multiplying by 8(additive and scaling problems)

Multiply two-digit numbers by one-digit numbers, using mental and progressing to formal written methods
For example, calculate 14 X 4 by…
• Doubling 14 and doubling again
• 14 X 4 = (10 X 4) + (4 X 4)
• Showing as an array and then an open array (no dots!) as a stepping stone to grid method.</td></tr>
<tr><td colspan="2">Pace</td><td>Fluency</td><td>Destinations for reaching expected Y3 level with teaching notes.</td></tr>
<tr><td rowspan="2">AUTUMN</td><td rowspan="2">1 WEEK</td><td>Counting in 10s 5s 20s 25s</td><td>Statistics
Interpret and present data using bar charts, 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.

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.
Relate the scales of bar charts to number lines.
Solve word different word problems all based around the same bar chart etc.</td></tr>
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Pace		Fluency	Destinations for reaching expected Y3 level with teaching notes.
SPRING	2 WEEKS	Count from 0 in multiples of 4, 8, 50 and 100; Review how to read and write numbers up to 1000 in numerals and in words Note the pattern of three digits and commas.	**The Number System: Whole numbers to 1,000** ***Find 10 or100 more or less than a given number*** Use broken or blank hundred squares with missing pieces. ***Recognise the place value of each digit in a three-digit number (hundreds, tens, ones)*** Emphasise the significance of the position of each digit to its value/size using base 10, place value counters and arrow cards. ***Compare and order numbers up to 1000*** ***Emphasise numbers' sizes in relation to each other and the 'nearest' multiples.*** Placing on a number line (lines of different scales with different starting and end points) and finding nearest multiples of 10, 100 etc. Beginning rounding and estimating. Comparing with inequalities <> and the = symbol
SPRING	3 WEEKS	Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 Making and comparing numbers using digits cards Find rules and missing numbers in additive sequences. (Not always horizontally… show sequences with circles and arrows between, for example.)	**Calculating, Patterns & Algebra + and –** ***Add three digit numbers using expanded then compact columnar addition*** Use base 10, then place value counters and show expanded and compact next to each other to see links. Solve addition word problems. Estimate answers first using rounding and check with the inverse. Using addition to check these subtractions… ***Subtract three digit numbers using expanded then compact columnar subtraction*** 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. 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. Solve subtraction word problems. Estimate answers first using rounding and check with the inverse. ***Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.*** **Write calculations in different ways e.g. 23 = ? + 12 ; 43 + 25 = ? – 8; and 12 + 15 < ? – 2** Use bar models to show whole part-part inverse relationships.

Pace		Fluency	Destinations for reaching expected Y3 level with teaching notes.
SPRING	3 WEEKS	Chanting 3 and 6 X table. Find rules and missing numbers in multiplicative/doubling or halving sequences. (Not always horizontally… show sequences with circles and arrows between, for example.)	**Calculating, Patterns & Algebra: X and ÷** ***Recall and use multiplication and division facts for the 3x table*** Make links with doubling and doubling again. Make links with properties of even numbers. Investigate patterns with multiples of 3, Create arrays for multiples of 3… show inverse relationship and write X and division facts. Use bar models to show the same relationships. Use Cuisenaire rods to show 'how many 3s make 24'. Show counting in groups of 3 on a number line. Solve word problems that relate to multiplying and dividing by 3 (additive, scaling and grouping problems) ***Recall and use multiplication and division facts for the 6x table.*** Make links with doubling and doubling again. Make links with properties of even numbers. Investigate patterns with multiples of 6, Create arrays for multiples of 6… show inverse relationship and write X and division facts. Use bar models to show the same relationships. Use Cuisenaire rods to show 'how many 6s make 24'. Show counting in groups of 6 on a number line. Investigate remainders using arrays or number lines. E.g. 31 ÷ 6… Solve word problems that relate to multiplying by 6 and dividing by 6 (additive, scaling and grouping problems) ***Multiply two-digit numbers by one-digit numbers, using mental and progressing to formal written methods*** 14 X 3… • 14 X 3 = (10 X 3) + (4 X 3) • Show as an array and then an open array (no dots!) as a stepping stone to grid method.
SPRING	2 WEEKS	Chanting 3 X and 6 X tables Find rules and missing numbers in fractional sequences. (Not always horizontally… show sequences with circles and arrows between, for example.)	**The Number System: fractions of numbers** ***Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.*** Find 1/10 and then 2/10 etc. of numbers by dividing by 10. Link back to work on 3 x table and 6 x table… find 1/3 or 2/3 of amounts etc. Be sure to find unit fractions first and show pictorially with bar models. Don't just teach a trick of dividing by the denominator and multiplying by the numerator! Relate to real life contexts in word problems.

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SPRING	2 WEEKS	Chant 4 and 8 X tables. Find ¼ of a number. ¼ of a shape. Find 1/8 of a number and 1/8 of shape.	**Geometry Angles & properties of shape** ***Recognise angles as a property of shape or a description of a turn.*** ***Identify right angles, recognise that 2 right angles make a half-turn, 3 make three quarters of a turn and 4 a complete turn*** ***Identify whether angles are greater than or less than a right angle.*** ***Identify horizontal and vertical lines and pairs of perpendicular and parallel lines.*** ***Draw 2-D shapes and make 3-D shapes using modelling materials*.** Physically turn, think about viewing a turn from above, use bee-bots or pro-bots or other coding programmes to help children visualise.
Pace		**Fluency**	**Destinations for reaching expected Y3 level** with teaching notes.
SUMMER	2 WEEKS	Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 Solving empty box/missing number problems including those with inequalities.	**The Number System: Whole numbers to 1,000** ***Compare and order numbers up to 1,000 – numbers in relation to each other*** Placing on a number line and finding nearest multiples of 10, 100 etc. Beginning rounding and estimating. comparing with inequalities <> and the = symbol Review from Y2: 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.
SUMMER	3 WEEKS	Measure, compare, add and subtract mass (kg/g); Measure, compare, add and subtract volume/capacity (l/ml). Find rules and missing numbers in additive sequences. (Not always horizontally… show sequences with circles and arrows between, for example.)	**Calculating, Patterns & Algebra + and –** ***Add and subtract three digit numbers using expanded then compact columnar addition*** Use word problems and different contexts to solve problems. Link with mass and capacity: Measure, compare, add and subtract mass (kg/g); Be sure to use calculations which wouldn't be solved more efficiently mentally. Estimate answers first using rounding and check with the inverse. ***Add and subtract amounts of money to give change, using both £ and p in practical contexts.*** Find the change from £1, £5 etc. where columnar would not be as efficient. Ensure word problems and real life contexts are used to explore addition and subtraction of money.

SUMMER	3 WEEKS	Chanting weaker times tables from 3, 6, 4 and 8s. Finding division facts by using the inverse of times tables. Find rules and missing numbers in multiplicative sequences. (Not always horizontally… show sequences with circles and arrows between, for example.)	**Calculating, Patterns & Algebra: X and ÷** ***Solve problems, including missing number problems, involving multiplication and division*** Use known times table facts but keep ensuring understanding is there, referring to arrays or bar models to show inverse relationships. Use times table facts to find divisions and remainders. Find fractions of numbers using division facts Use word problems relating to mental multiplication and division. ***Solve scaling problems (include word problems)*** What is twice as long as 17cm? What is 3 times as long? If we know 3 X 6 = 18, what is 30 X 6 (use procedural variation to explore patterns) ***Transition to more formal methods of multiplication*** The big idea here is partitioning and recombining which we use when doubling or when doing more complex HTO X TO etc. Show TO X O using 3 or 6 as multiplier because X4 could be done by doubling and doubling! Some children may be able to do HTO X O using grid method.

Pace		Fluency	Destinations for reaching expected Y3 level with teaching notes.
SUMMER	2 WEEKS	Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 Count in 5s and 15s	**Measures: Time** ***Tell and write the time from:*** - an analogue clock and 12-hour and 24-hour clocks; - an analogue clock, including using Roman numerals from I to XII. ***Use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight.*** ***Estimate and read time with increasing accuracy to the nearest minute.*** *Record and compare time in terms of seconds, minutes and hours* Know the number of seconds in a minute and the number of days in each month, year and leap year ***Compare durations of events [for example to calculate the time taken by particular events or tasks].*** Use number lines to find time durations and differences. Use timetables to explore word problems and real life contexts.
SUMMER	2 WEEKS	Count up and down in tenths	**The Number System: fractions as numbers** ***Recognise that tenths arise from dividing an object into 10 equal parts.*** *Use fraction cards representing the tenth family i.e. fifths, tenths and twentieths.* Recognise and show, using diagrams, equivalent fractions with small denominators ***Add and subtract fractions with the same denominator within one whole*** Use fraction cards to add and subtract fractions within one 'family' of fractions… perhaps revisit the tenth family. Some children will be able to add fractions with different denominators within the same family.