Mathematics Journey Planner: Y1

OVERVIEW & BIG IDEAS

AUTUMN		SPRING		SUMMER	
4 weeks	**The Number System: getting started** Numbers can be represented in different ways using objects, pictures or numerals. This unit (and whole term) is all about visuals, images and models of number. Their stable order must be known and their numeral or name does not always give us a clue about their value e.g. 14. Our number system is base 10. The teens numbers must be seen as ten and one, ten and two and so on. The position (place) of a digit in a number determines its value. We can place numbers on a track, line or 100 square to compare them.	3 weeks	**The Number System: whole numbers to 100; Measures** Numbers can be represented in different ways using objects, pictures or numerals. Their stable order must be known and their numeral or name does not always give us a clue about their value e.g. 14. Our number system is base 10. The teens numbers must be seen as ten and one, ten and two and so on. The position (place) of a digit in a number determines its value. We need standard units of measure in order to compare things more accurately and consistently. We can place numbers on a track, line or 100 square to compare them.	3 weeks	**The Number System: Numbers to 100; Measures** Numbers can be represented in different ways using objects, pictures or numerals. Their stable order must be known and their numeral or name does not always give us a clue about their value e.g. 14. Our number system is base 10. The teens numbers must be seen as ten and one, ten and two and so on. The position (place) of a digit in a number determines its value. We need standard units of measure in order to compare things more accurately and consistently. We can place numbers on a track, line or 100 square to compare them.
4 weeks	**Calculating, Patterns & Algebra + and – (A)** = means 'equivalent', 'the same as' or 'balances'. Understanding this before other symbols are introduced helps children make sense of equations written with = in different positions. We can compare numbers using > or < . We can partition numbers into two or more parts. We can add two or more of these parts in any order (commutativity). We can add or subtract by counting on or back in ones BUT knowing the 'story of a number' can help us add or subtract by calculation! Use a whole-part model (Numicon , 10 frames, Cuisenaire) to picture addition and subtraction. Relating numbers to 5 and 10 can help us to add by calculating, using bonds.	3 weeks	**Calculating, Patterns & Algebra + and –; Measures** = means 'equivalent', 'the same as' or 'balances'. Understanding this before other symbols are introduced helps children make sense of equations written with = in different positions. We can compare numbers or expressions that use + or - using > or < . We can partition numbers into two or more parts. We can add two or more of these parts in any order (commutativity). We can add or subtract by counting on or back in ones BUT knowing the 'story of a number' can help us add or subtract by calculation! Use a whole-part model (Numicon , 10 frames, Cuisenaire) to picture addition and subtraction. Relating numbers to 5 and 10 can help us to add by calculating, using bonds.	3 weeks	**Calculating, Patterns & Algebra + and –; Measures** = means 'equivalent', 'the same as' or 'balances'. Understanding this before other symbols are introduced helps children make sense of equations written with = in different positions. We can compare numbers or expressions that use + or - using > or < . We can partition numbers into two or more parts. We can add two or more of these parts in any order (commutativity). We can add or subtract by counting on or back in ones BUT knowing the 'story of a number' can help us add or subtract by calculation! Use a whole-part model (Numicon , 10 frames, Cuisenaire) to picture addition and subtraction. Relating numbers to 5 and 10 can help us to add by calculating, using bonds.
1 week	**Geometry** The properties of a shape tell us what name it should have and helps us to group shapes with the same or similar properties. Shapes have the same names and properties when they are at different orientations or scaled to a different size (still congruent). 2D shapes are closed shapes. 3D shapes are made up of 2D faces.	3 weeks	**Calculating, Patterns & Algebra X and Division** The concept of 'fair shares' is quickly grasped by children and will have been covered in Reception as a first exploration of division. Children now need to develop the big idea of 'unitisation' where they count in 'groups of' a number. Division can be seen as 'how many groups of…in…'. The inverse relationship can also be explored through arrays. Children learn about doubling as 'two groups of' and counting in other 'groups of' numbers. Division can be explored as the inverse through 'grouping', as well as 'sharing'.	3 weeks	**Calculating, Patterns & Algebra: X and ÷** The concept of 'fair shares' is quickly grasped by children and will have been covered in Reception as a first exploration of division. Children now need to develop the big idea of 'unitisation' where they count in 'groups of' a number. Division can be seen as 'how many groups of…in…'. The inverse relationship can also be explored through arrays. Children learn about doubling as 'two groups of' and counting in other 'groups of' numbers. Division can be explored as the inverse through 'grouping', as well as 'sharing'.
2 weeks	**The Number System: Fractions *of* shapes & fractions as numbers** Fractions are equal parts of a whole which can be a whole shape. Fractions can also be counted like any other numbers!	2 Weeks	**The Number System: Fractions *of* shapes and quantities & fractions *as* numbers** **Geometry: position; Measures: Time** Fractions are equal parts of a whole which can be a whole shape. Fractions can also be counted like any other numbers!	1 Week	**Measures: time** We measure time in seconds, minutes, hours, days, weeks and years (and decades and centuries!). We use times of the day to help us order and organise when things happen.
3 weeks	**Calculating, Patterns & Algebra all operations (B); measures** We can add or subtract by counting on or back in ones BUT knowing the 'story of a number' can help us add or subtract by calculation! Use a whole-part model (Numicon , 10 frames, Cuisenaire) to picture addition and subtraction. Relating numbers to 5 and 10 can help us to add by calculating, using bonds. Repeated addition can also be understood as multiplying and counting in 'groups of'.	1	**Geometry** 3D shapes are made up of 2D faces and they have depth/volume.	2	**The Number System & Calculating, Patterns & Algebra check-up!** Review all number work and focus in on essentials!

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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 Y1 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 Y1 level** with teaching notes.
AUTUMN	4 WEEKS	**Count forwards and backwards in 1s from any number up to 100.** At EP we call counting in 1s 'Wormy ones'. Support this with number tracks or number lines, depending on security. Play games where children roll a die marked with 1 or 2 and move forward either 1 or 2, winning when they reach 20. Find one more or one less day or hour on a time line.	**The Number System: getting started** ***Read and write numbers from 1 to 20 in numerals and words.*** ***Count, read and write numbers to 100 in numerals.*** ***Given a number, identify on more and one less.*** ***Identify and represent numbers using objects and pictorial representations, and use the language of equal to, more than, less than (fewer), most and least.*** Explore the story of each number from 1-20 using different representations: counters, dominoes, straws, pegs, Numicon tiles, Cuisenaire and bar modeled whole-part relationships. Have a number of the day or few days and make a 'number table' in the classroom showing lots of different representations of the number of the day. Numbers 5-10 need more focus than 1-4. Develop children's ability to subitise using dice and dominoes. Make a big fuss of bonds to 10 and play games like ping pong which help to memorise bonds to 10. Ten-frames are a key representation for pairs (or three numbers) which add to ten. Teens numbers are a huge focus in this unit. Investigate teen numbers and how they are ten and 1, ten and 2 etc. show this with Numicon tiles, Cuisenaire, base ten and place value cards. Really go deep on this and ensure that children are not writing 14 and 41 because of how the number 'sounds'. This is a big deal. Understanding the partitioning of teens numbers is a crucial step. Go over it in as many ways as possible. Place teens numbers on a number line, matching with Numicon tiles. Number tracks are the representation that children will be used to from Reception and it is a big leap to understanding number lines – not to be taken for granted. On a number line, each individual point has a theoretical value e.g. 1.5, but children don't need to know this at this stage! Placing numbers on a number line and finding one more and one less discourages counting from 1. Don't rush ordering and placing teens numbers. Compare quantities (i.e. Dots) and numbers using inequality symbols <> and =. These symbols are very important to understand. The = symbol should be read as 'is equivalent to' 'is equal to' 'is the same as' or 'balances with'. Where it is placed in an equation needs to be varied so children get used to this and never think of it as meaning 'the answer is'.

Timing		Fluency	Destinations for reaching expected Y1 level with teaching notes.
AUTUMN	4 WEEKS	**Count in to 100 in 10s, forwards and backwards** Play games such as Totality and Don't roll a 6! And be explicit about which facts you could use to add without counting on in ones. Find rules and missing numbers in additive sequences.	**Calculating, Patterns & Algebra + and – (A)** ***Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs.*** ***Represent and use number bonds and related subtraction facts within 20.*** ***Add and subtract one-digit and two digit numbers to 20, including zero.*** It might seem like an important stage for children to count on from a number in order to add. In the previous unit, children will have placed numbers on a line and counted on 1more or back 1 less. Starting with a larger number and counting on in 'hops' will become important for bridging ten in the Spring but for now, **the key is to calculate, not count on in 1s.** If children are going right back to 1 to add, further work needs to be done on understanding a number's cardinal place value. From the previous unit of work, children should be becoming more secure with the 'story of' numbers up to 20, and finding one more or one less than numbers. This has to be the foundation for + and -, and, again, if children are not secure, more work on the number system needs to be continued. Work within the 'story of' numbers to 20, modelling whole-part relationships with Numicon, Ten Frames and Cuisenaire rods (where white =1) and then draw pictorially as bar models. Write addition and subtraction number sentences (equations) e.g. part + part = whole; whole – part = part so 5 + 6 = 11; 6 + 5 = 11; 11 – 6 = 5 and 11 – 5 = 6 Bonds to 10 are crucial, but bonds to other numbers from 2-9 are also really important. This unit of work will be about using these bonds to calculate up to 20 e.g. (11 + 9 = 20 because I know 1 + 9 = 10) some children might be able to go beyond (34 + 6 = 40 because I know 4 + 6 = 10). Do lots of work to make connections from work on place value to the rest of the number system 'if I know… I know…' e.g. If I know 5 + 5= 10, 5 + 6 = 11; If I know 4 + 6 = 10, 4 + 7 must = 11. There are other links to be made using procedural variation: 4 + 6 = 10, 14 + 6 = 20, 24 + 6 = 30. Again, model these whole-part relationships using Numicon, Ten Frames and Cuisenaire rods (where white = 1) and then draw pictorially as bar models. Stress that addition can be done in any order (commutativity) so when solving 5 + 4 + 5 we could add 5 and 5 first, making 10, then add 4. ***Solve one-step problems that involve addition and subtraction, using concrete objects & pictorial representations, and missing number problems such as 7 + ? = 9; 10 = ? + 3*** *NB. Talk about '<u>subtract</u>' rather than going for 'take away' or 'find the difference' which are strategies to be explored explicitly.* Write calculations horizontally (we tend to in KS1 but it's worth saying) and tell children to discuss the numbers in relation to each other. Are they far apart or close together? Which is the biggest? Smallest? Which number should we begin with? What 'linking thinking' can we do? <u>Strategies to be gradually introduced to get children calculating, not counting:</u> -Quick adds which do not involve bridging 10 e.g. 20 + 7 then 23 + 6 'because I know 3 + 6 = 9' -Quick subtractions e.g. 20 – 7 must be 13 because 10 – 7 = 3. Use concrete manipulatives, the number line image and whole/part models to support this. -Adding strings of numbers by making bonds or finding doubles (law of commutativity explored and flexibility encouraged e.g. we would do 7 + 5 + 3 by adding 7 and 3 to make 10 then 5 more is 15). -Add or subtract 10 to two digit numbers using spider counting (reinforced with Numicon tiles as concrete) and multiples of 10. Can any children add nearly numbers such as 9 by adding 10 and subtracting 1? The 100 square is the key image for this. Solve very simple one step word problems that require mental addition and subtraction using strategies taught. Check subtractions with the inverse. Write calculations in different ways and explore these using Numicon and balance scales e.g. 13 = ? + 4 ; 3 + 5 = ? – 2; and 2 + 5 > ? - 2

Timing		Fluency	Destinations for reaching expected Y1 level with teaching notes.
AUTUMN	1 WEEK	Find rules and missing numbers in additive sequences where the 'empty boxes' are different shapes e.g. 'what number goes in the triangle?'	***Geometry*** ***Recognise and name common 2-D shapes including rectangles (including squares), circles and triangles*** Look at, sort and notice the properties of 2-D shapes at different orientations and of different sizes. Children must get the hang not just of the names but of the properties starting in Y1 with sides and corners (vertices!). What are the sides like? Curved or straight? How many sides are there? Define that geometric shapes are closed shapes. Focus on grouping in different ways according to different properties. Sorting hoops or even Venn diagrams with 2 intersecting circles are great for this!
AUTUMN	2 WEEKS	Count in halves up to 10, starting from any number using a counting stick. Find rules and missing fractions in sequences. Rehears doubles and halves to 20.	**The Number System: Fractions *of* shapes & fractions *as* numbers** *NB. Although this document shows fractions like this ½ or ¾ it is MUCH better for you to write your fractions by hand or on a smart board so that the denominator is below not beside the numerator.* ***Recognise, find and name a half as one of two equal parts of an object, shape or quantity (fractions of shapes)*** Explore equal and unequal pieces of shapes, referring to the previous unit of work on geometry. Really emphasise that pieces must be equal and they are equal parts of a whole. Discuss what our 'whole' is. Tell them a shape is 1/2 and then get them to draw the rest. Focus on the denominator as representing the parts the whole is divided into. Keep the numerators as one at the beginning (unit fractions). Show 1/2 represented in different ways. You might even explore its equivalence with 2/4 of a shape. Ensure the shapes are different! Can the children find different ways of colouring exactly half of square? Can you find half of my cubes? Half of my water? ***Recognise, find and name half as one of two equal parts*** Count in fraction steps of halves on your counting stick, showing pictorial representations to support understanding. At first you might count in physical objects e.g. 'half an apple, one whole apple, one and a half apples, two apples…. Etc.' Discuss how we can write the fraction half as ½. The numerator shows us how many equal parts we have… 1/2 2/2 ('One whole!') 1 ½, 2 wholes, 2 1/2 , 3 wholes etc. Don't underestimate how difficult it is at first for children to write fractions using the dividing line etc. Give them opportunities to label fractional steps on a number line, modelled by your counting stick.

Timing		Fluency	Destinations for reaching expected Y1 level with teaching notes.
AUTUMN	3 WEEKS	**Sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening.]** Place days of the week or some of these words in order on a 'time line', starting from different places. Doubling numbers to 10 and halving numbers to 20; examine this inverse relationship. Find rules and missing numbers in sequences.	**Calculating, Patterns & Algebra + and – (B)** ***Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs.*** ***Represent and use number bonds and related subtraction facts within 20.*** ***Add and subtract one-digit and two digit numbers to 20, including zero.*** From earlier in the term, children should be becoming more secure with the 'story of' numbers up to 20, and finding one more or one less than numbers. This has to be the foundation for + and -, and, again, if children are not secure, more work on the number system needs to be continued. Autumn A review: Work within the 'story of' numbers to 20, modelling whole-part relationships with Numicon, Ten Frames and Cuisenaire rods (where white =1) and then draw pictorially as bar models. Write addition and subtraction number sentences (equations) e.g. part + part = whole; whole – part = part so 5 + 6 = 11; 6 + 5 = 11; 11 – 6 = 5 and 11 – 5 = 6 Bonds to 10 are crucial, but bonds to other numbers from 2-9 are also really important. This unit of work will be about using these bonds to calculate up to 20 e.g. (11 + 9 = 20 because I know 1 + 9 = 10) some children might be able to go beyond (34 + 6 = 40 because I know 4 + 6 = 10). Do lots of work to make connections from work on place value to the rest of the number system 'if I know… I know…' e.g. If I know 5 + 5= 10, 5 + 6 = 11; If I know 4 + 6 = 10, 4 + 7 must = 11. There are other links to be made using procedural variation: 4 + 6 = 10, 14 + 6 = 20, 24 + 6 = 30. Again, model these whole-part relationships using Numicon, Ten Frames and Cuisenaire rods (where white = 1) and then draw pictorially as bar models. Stress that addition can be done in any order (commutativity) so when solving 5 + 4 + 5 we could add 5 and 5 first, making 10, then add 4. ***Solve one-step problems that involve addition and subtraction, using concrete objects & pictorial representations, and missing number problems such as 7 + ? = 9; 10 = ? + 3*** *NB. Talk about '<u>subtract</u>' rather than going for 'take away' or 'find the difference' which are strategies to be explored explicitly.* Write calculations horizontally (we tend to in KS1 but it's worth saying) and tell children to discuss the numbers in relation to each other. Are they far apart or close together? Which is the biggest? Smallest? Which number should we begin with? What 'linking thinking' can we do? <u>Strategies to be gradually introduced to get children calculating, not counting:</u> -Quick adds which do not involve bridging 10 e.g. 20 + 7 then 23 + 6 'because I know 3 + 6 = 9' -Quick subtractions e.g. 20 – 7 must be 13 because 10 – 7 = 3. Use concrete manipulatives, the number line image and whole/part models to support this. -Adding strings of numbers by making bonds or finding doubles (law of commutativity explored and flexibility encouraged e.g. we would do 7 + 5 + 3 by adding 7 and 3 to make 10 then 5 more is 15). -Add or subtract 10 to two digit numbers using spider counting (reinforced with Numicon tiles as concrete) and multiples of 10. Can any children add nearly numbers such as 9 by adding 10 and subtracting 1? The 100 square is the key image for this. This type of subtraction is 'taking away'. Begin slowly with the concept of difference, using known bonds. E.g. which numbers have a difference of 1 or 2? Use Numicon tiles to show 'difference' and then pictorial representation as a bar model showing whole-part relationships. Find the difference on a number line by counting up or, preferably, using known number facts to calculate. Rows of cubes could be compared to show whole-part relationships and 'difference' too. NB numbers that are close together lend themselves better to 'find the difference' and numbers that are far apart lend themselves to 'take away'. Children need to spend lots of time (years!) understanding these concepts and your calculations need to be intelligently designed to suit one strategy at a time before allowing the children to choose which is best. Solve very simple one step word problems that require mental addition and subtraction using strategies taught. Check subtractions with the inverse. Write calculations in different ways and explore these using Numicon and balance scales e.g. 13 = ? + 4 ; 3 + 5 = ? – 2; and 2 + 5 > ? - 2

AUTUMN	1 WEEK	Counting in 10s 5s and 2s Tally in 5s	**Statistics** ***Interpret and construct simple pictograms, tally charts, block diagrams and simple tables.*** ***Ask and answer simple questions by counting the number of objects in each category and sorting categories by quantity.*** Ask simple questions of the class and record as tally charts and frequency tables. From this information, interpret the data e.g. 'there are 3 more children who like swimming than basketball.' Use this data to create pictograms. Discuss how the pictograms chosen should all look the same. You could use printing for this! Create a block diagram (like a bar chart but using postits for example or Duplo bricks to physically build a block graph) using the data. Finally, if children are secure, show how this can be represented as a bar graph where the bar is continuous. Remember to keep bars separate from each other. Choose your scale carefully and talk through the decisions e.g. 'I need it to go up to beyond our largest data set..' Use and try different scales. Make links with science and topic projects. Relate the scales of bar charts to number lines. Solve word different word problems all based around the same bar chart etc.

Timing		Fluency	Destinations for reaching expected Y1 level with teaching notes.
SPRING	2 WEEKS	**Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number.** We don't fall off the edge of the world after 100, the pattern continues! At EP we call counting in 1s 'Wormy ones' **Count in multiples of twos, fives and tens.** At EP we call counting on in 10s 'Spider counting'. Halving (this supports number line work by estimating where half way is). Discuss finding 'half of' the number line and 'half way between' two points etc.	**The Number System: whole numbers to 100; measures** ***Read and write numbers from 1 to 20 in numerals and words.*** ***Count, read and write numbers to 100 in numerals.*** ***Given a number, identify one more and one less.*** ***Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most and least.*** Review the 'story of' numbers from the Autumn term, particularly teens numbers. Extend this to partition all two digit numbers using Numicon tiles, base ten and place value cards. Place numbers on number lines and discuss their relative value and size. Fill in missing numbers on number lines. Which is the nearest multiple of 10? At EP we call them café numbers. How far to the nearest café? Children should begin to represent two digit numbers (tens and ones) in different ways, using Numicon, straws, ten frames, place value cards etc. They need to understand at this point that if we add tens, the ones digit doesn't change! Explore how a 100 square is just a number track chopped up into 10s. Children can create 100 squares in this way. Do activities where children fill in parts of empty 100 squares and count on or back in 1s or 10s from any number. Represent this with Numicon tiles, base ten or place value counters too to show how the 10s digit is the bit that changes, not the ones digit. At EP we call this spider counting. Begin to forge connections from these foundations to the rest of the number system 'if I know… I know…' e.g. If I know 1 + 2 = 3 then I know 21 + 2 = 23. If I know 4 + 6 = 10, 24 + 6 = 30. If I know 5 + 5= 10, 5 + 6 = 11 Explore the idea of = as equivalence and balance using empty box partitions, Numicon tiles in balance scales and placing the = symbol in different places in equations. As well as making connections to solve addition problems, children should solve inequality problems, equivalence/ balance problems and empty box problems e.g. 12 = ? + 5 (don't always use number bonds to 10 as they're too familiar with them!), is 4 + 10 > or < than 11 + 4. Create questions like this which draw attention to the underlying structure and place value of the digits. Give children digit cards to place to complete equations and inequalities. They should also be able to order all numbers to 100 and say which are bigger and smaller. Ask questions such as 'how many 1s in 10?' to open up discussion and reasoning. ***Compare, describe and solve practical problems for lengths and heights [for example, long/short, longer/shorter, tall, short, double, half]*** ***Measure and begin to record the following: lengths and heights*** Autumn review: Compare quantities (i.e. Dots) and numbers using inequality symbols <> and =. These symbols are very important to understand. The = symbol should be read as 'is equivalent to' 'is equal to' 'is the same as' or 'balances with'. Where it is placed in an equation needs to be varied so children get used to this and never think of it as meaning 'the answer is'. Compare lengths and heights using 'longer and shorter' measuring with strips of paper or string etc. or other non-standard units e.g. feet, lolly-sticks or cubes. This is great for estimation and the beginning of unitization. Discuss how it is useful to be more accurate if two people/lengths are almost the same. This is how standard units of measurement arise. The Y1 curriculum does not specify measuring in a particular unit but, depending on your class' security with numbers to 100, you could introduce a metre stick as showing 100 cm. Mark different lengths in cm on the meter stick. How do these compare to your rulers? Tie this in with place value work, placing numbers to 100. Ask children to find half or double a length or height in practical problem solving contexts.

Timing		Fluency	Destinations for reaching expected Y1 level with teaching notes.
SPRING	3 WEEKS	Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 Count on or back in 10s At EP we call this 'spider counting'. Encourage children to begin to add or subtract (this is taking away) nearly numbers such as 11 and 9. Find rules and missing numbers in additive sequences. (Not always horizontally… show sequences with circles and arrows between, for example.)	**Calculating, Patterns & Algebra + and – ; measures** ***Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs.*** ***Represent and use number bonds and related subtraction facts within 20.*** ***Add and subtract one-digit and two digit numbers to 20, including zero.*** Use the 'story of' numbers to 20, to add and subtract other numbers. For less secure children, stay within 0-20 but give them opportunities to look at related equations (procedural variation). Write addition and subtraction number sentences (equations) e.g. part + part = whole; whole – part = part so 5 + 6 = 11; 6 + 5 = 11; 11 – 6 = 5 and 11 – 5 = 6. Bonds to 10 are crucial, but bonds to other numbers from 2-9 are also really important. Encourage children to continue using bonds to calculate up to 20 and beyond e.g. (11 + 9 = 20 because I know 1 + 9 = 10 , 34 + 6 = 40 because I know 4 + 6 = 10. Do lots of work to make connections from work on place value to the rest of the number system 'if I know… I know…' e.g. If I know 5 + 5= 10, 5 + 6 = 11; If I know 4 + 6 = 10, 4 + 7 must = 11. There are other links to be made using procedural variation: 4 + 6 = 10, 14 + 6 = 20, 24 + 6 = 30. Model whole-part relationships using Numicon, Ten Frames, Cuisenaire rods (where white = 1) and you might introduce base ten. Draw pictorially as bar models. Begin to add and subtract numbers which bridge by partitioning the single digit in different ways 10 e.g. 27 + 5 = 27 + 3 + 2; 23 – 7 = 27 – 3 – 4 This strategy needs lots of exploration. A number line might be a useful pictorial representation, or using Numicon tiles. ***Solve one-step problems that involve addition and subtraction, using concrete objects & pictorial representations, and missing number problems such as 7 + ? = 9; 10 = ? + 3*** *NB. Talk about 'subtract' rather than going for 'take away' or 'find the difference' which are strategies to be explored explicitly.* Autumn review: Write calculations horizontally (we tend to in KS1 but it's worth saying) and tell children to discuss the numbers in relation to each other. Are they far apart or close together? Which is the biggest? Smallest? Which number should we begin with? What 'linking thinking' can we do? Strategies to be gradually introduced to get children calculating, not counting: -Quick adds which do not involve bridging 10 e.g. 20 + 7 then 23 + 6 'because I know 3 + 6 = 9' -Quick subtractions e.g. 20 – 7 must be 13 because 10 – 7 = 3. Use concrete manipulatives, the number line image and whole/part models to support this. -Adding strings of numbers by making bonds or finding doubles (law of commutativity explored and flexibility encouraged e.g. we would do 7 + 5 + 3 by adding 7 and 3 to make 10 then 5 more is 15). -Add or subtract 10 to two digit numbers using spider counting (reinforced with Numicon tiles as concrete) and multiples of 10. Can any children add nearly numbers such as 9 by adding 10 and subtracting 1? The 100 square is the key image for this. Find the 'difference' between numbers by counting up using a known fact, a number line or Numicon. Rows of cubes could be compared to show whole-part relationships and 'difference' too. Solve very simple one step word problems that require mental addition and subtraction using strategies taught. Check subtractions with the inverse. Write calculations in different ways and explore these using Numicon and balance scales e.g. 13 = ? + 4 ; 3 + 5 = ? – 2; and 2 + 5 > ? - 2 -Adding strings of numbers by making bonds or finding doubles (law of commutativity explored and flexibility encouraged e.g. we would do 7 + 5 + 3 by adding 7 and 3 to make 10 then 5 more is 15. This is the expected level of mental addition in Y2. -Add 10 to numbers using spider counting (reinforced with Numicon tiles as concrete) and multiples of 10. Can children add nearly numbers such as 9 by adding 10 and subtracting 1? The 100 square is the key image for this. ***Recognise and know the value of different denominations of coins*** Consider the big step in understanding that a coin's physical size does not give us a clue about its value; the place value is implicit! Children who count all coins as 'one' indiscriminately have not got a secure enough understanding value yet and need to add 1ps only. The NC does not say Y1 needs to add coins but for children who understand the implicit value of different coins, explore adding 10ps and 1ps to link to work on place value. Explore adding small amounts of 1ps 2ps and 5ps.

Timing		Fluency	Destinations for reaching expected Y1 level with teaching notes.
SPRING	3 WEEKS	**Count in multiples of 2, 5 and 10** Spot patterns in the multiples. Make a fuss when you say a multiple of 10 when counting in 2s! Solve number sequence problems.	**Calculating, Patterns & Algebra X and Division** ***There is no emphasis in the Y1 or Y2 Curriculum on doubling but time should be spent on doubling numbers to 10, or 12, and then to the inverse: halving.*** ***Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.*** Present children with some division problems which require 'fair sharing' e.g. 'one for you, one for you, one for you…' Children usually have a firm grasp of 'what's fair' but may not be totally secure with this from Reception. Children may see division as 'sharing' so halving needs explicit teaching as viewing the number or amount 'in two groups'. It is linked to fractions work in the next unit. Look at doubling as 'two groups of' which is based on the idea of 'unitisation' where you count in 'groups of' a number. Numicon tiles are very useful for this and you can also use balance scales to show that 4 + 4 = 2 X 4 = 8. Spend time exploring what the X symbol represents. It is not explicit in the Y1 curriculum that they must understand this symbol but they should understand this as 'four add four is equivalent to two groups of 4'. ***Count in multiples of twos, fives and tens*** Make links with counting in these numbers and 'unitising' e.g. '0, 2, 4, 6, 8… we have counted four groups of 2 and it equalled 8! We can write this as 2 + 2 + 2 + 2 or 4 X 2. Encourage children to spot patterns in the multiples as they count in twos, fives and tens. ***Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.*** Present children with some division problems which suit 'grouping' as a strategy. Use concrete manipulatives… can you put these counters into groups of 5? Use Cuisenaire rods to show step counting 'how many 2s make 12'. Represent this pictorially with a bar model showing whole-equal parts. Show counting in groups of 2, 5 and 10 on a number line. Create arrays to solve multiplication or division word problems. NB If we are dividing by 5 then we should draw our array in 5s until we reach our total, rather than drawing 15 dots then making rings round them in 5s! Solve problems by creating arrays, using Cuisenaire rods to show 'how many 2s make 12', counting on a number line (repeated addition) or using known and related facts. Represent this with a bar model showing whole-equal parts. Children should always be encouraged to use facts they know to link to solutions.

Timing		Fluency	Destinations for reaching expected Y1 level with teaching notes.
SPRING	2 WEEKS	**Count in steps of 3.** Chant the 3X table (this is in the Y3 curriculum but will be useful for this unit of work) 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* shapes & fractions *as* numbers; Geometry: position and direction; Measures: time** *NB. Although this document shows fractions like this ½ or ¾ it is MUCH better for you to write your fractions by hand or on a smart board so that the denominator is below not beside the numerator.* ***Autumn review: Recognise, find and name a half as one of two equal parts of an object, shape or quantity (fractions of shapes)*** ***Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.*** Explore equal and unequal pieces of shapes, referring to the previous unit of work on geometry and fractions. Really emphasise that pieces must be equal and they are equal parts of a whole. Discuss what our 'whole' is. Tell them a shape is 1/2 and then get them to draw the rest. Focus on the denominator as representing the parts the whole is divided into. Keep the numerators as one at the beginning (unit fractions). Show 1/2 represented in different ways. You might even explore its equivalence with 2/4 of a shape. Ensure the shapes are different! Can the children find different ways of colouring exactly half of square? Can you find half of my cubes? Half of my water? Try paper folding and building a fraction wall for the half and quarter family. If when we have 2 equal parts we call one of them 1/2 , how might we write our fraction if we have one of 4 equal parts? We call this a quarter! Label shapes that have ¼ shaded. Use fraction cards to support the very beginnings of equivalence between ½ and 2/4 . https://www.ncetm.org.uk/resources/43609 ***Recognise, find and name quarter as one of two equal parts*** Count in fraction steps of quarters on your counting stick, showing pictorial representations to support understanding. At first you might count in physical objects e.g. 'quarter of an apple, half an apple, three quarters of an apple, one whole apple, one and a quarter apples, one and a half apples, one and three quarter apples, two whole apples…. Etc.' Discuss how we can write the fraction quarter as 1/4. The numerator shows us how many equal parts we have. Don't underestimate how difficult it is at first for children to write fractions using the dividing line etc. Give them opportunities to label fractional steps on a number line, modelled by your counting stick. Spend time exploring the meaning of 2/4 and perhaps its equivalence to ½. Spend even longer exploring ¾ and what the 3 signifies. ***Describe position, direction and movement including whole, half, quarter and three quarter turns.*** ***Tell the time to the hour, half past the hour and draw the hands on the clock.(This will be looked at in much more detail in the Summer)*** Use these as valuable contexts for deepening understanding of fractions.
SPRING	2 WEEKS	Count in steps of 5p, 20p and 10p etc. to support money work. Rehearse number bonds to 100	***Geometry*** ***Recognise and name common 2-D and 3-D shapes including rectangles (including squares), circles and triangles; cuboids (including cubes), pyramids and spheres.*** Autumn review: Look at, sort and notice the properties of 2-D shapes at different orientations and of different sizes. Children must get the hang not just of the names but of the properties starting in Y1 with sides and corners (vertices!). What are the sides like? Curved or straight? How many sides are there? Examine how 3D shapes have faces, edges and corners (vertices). Count these properties. Use nets to explore which 2D shapes define their faces. Can you spot 3D shapes in every-day life?

Timing		Fluency	Destinations for reaching expected Y1 level with teaching notes.
SUMMER	3 WEEKS	**Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number.** We don't fall off the edge of the world after 100, the pattern continues! At EP we call counting in 1s 'Wormy ones' **Count in multiples of twos, fives and tens.** At EP we call counting on in 10s 'Spider counting'. Halving (this supports number line work by estimating where half way is). Discuss finding 'half of' the number line and 'half way between' two points etc.	**The Number System: whole numbers to 100; measures** ***Read and write numbers from 1 to 20 in numerals and words.*** ***Count, read and write numbers to 100 in numerals.*** ***Given a number, identify one more and one less.*** ***Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most and least.*** Review the 'story of' numbers from the Autumn/ Spring terms, particularly teens numbers. Extend this to partition all two digit numbers using Numicon tiles, base ten and place value cards. Place numbers on number lines and discuss their relative value and size. Fill in missing numbers on number lines. Which is the nearest multiple of 10? At EP we call them café numbers. How far to the nearest café? Children should begin to represent two digit numbers (tens and ones) in different ways, using Numicon, straws, ten frames, place value cards etc. They need to understand at this point that if we add tens, the ones digit doesn't change! Explore how a 100 square is just a number track chopped up into 10s. Children can create 100 squares in this way. Do activities where children fill in parts of empty 100 squares and count on or back in 1s or 10s from any number. Represent this with Numicon tiles, base ten or place value counters too to show how the 10s digit is the bit that changes, not the ones digit. At EP we call this spider counting. Begin to forge connections from these foundations to the rest of the number system 'if I know… I know…' e.g. If I know 1 + 2 = 3 then I know 21 + 2 = 23. If I know 4 + 6 = 10, 24 + 6 = 30. If I know 5 + 5= 10, 5 + 6 = 11 Explore the idea of = as equivalence and balance using empty box partitions, Numicon tiles in balance scales and placing the = symbol in different places in equations. As well as making connections to solve addition problems, children should solve inequality problems, equivalence/ balance problems and empty box problems e.g. 12 = ? + 5 (don't always use number bonds to 10 as they're too familiar with them!), is 4 + 10 > or < than 11 + 4. Create questions like this which draw attention to the underlying structure and place value of the digits. Give children digit cards to place to complete equations and inequalities. They should also be able to order all numbers to 100 and say which are bigger and smaller. Ask questions such as 'how many 1s in 10?' to open up discussion and reasoning. ***Compare, describe and solve practical problems for mass/weight & capacity and volume [for example, heavy/light, heavier/lighter, heavier than, lighter than, full/empty, more than, less than, half full, double, half, quarter]*** ***Measure and begin to record the following: mass/weight; capacity and volume*** Autumn/Spring review: Compare quantities (i.e. Dots) and numbers using inequality symbols <> and =. These symbols are very important to understand. The = symbol should be read as 'is equivalent to' 'is equal to' 'is the same as' or 'balances with'. Where it is placed in an equation needs to be varied so children get used to this and never think of it as meaning 'the answer is'. Compare weights using 'heavier/lighter ' etc. using balance scales. This is great for estimation and the beginning of unitization i.e. 'how many cubes weigh the same as one egg? Discuss how it is useful to be more about the weight. This is how standard units of measurement arise. The Y1 curriculum does not specify measuring in a particular unit but, depending on your class' security with numbers to 100 and beyond, you could introduce a gram weight and a kilo gram. How many grams do they think weigh the same as 1kg? Investigate. Can they weigh objects using balance scales and grams? Go through the same process comparing capacities. Which glass holds more liquid: the short wide glass or the tall narrow one? Show how it could be the same! Ask children to find half or double a mass or capacity in practical problem solving contexts.

Timing		Fluency	Destinations for reaching expected Y1 level with teaching notes.
SUMMER	3 WEEKS	Recall and use addition and subtraction facts for numbers up 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 –; measures** ***Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs.*** ***Represent and use number bonds and related subtraction facts within 20.*** ***Add and subtract one-digit and two digit numbers to 20, including zero.*** Spring review: use the 'story of' numbers to 20, to add and subtract other numbers. For less secure children, stay within 0-20 but give them opportunities to look at related equations (procedural variation). Write addition and subtraction number sentences (equations) e.g. part + part = whole; whole – part = part so 5 + 6 = 11; 6 + 5 = 11; 11 – 6 = 5 and 11 – 5 = 6. Bonds to 10 are crucial, but bonds to other numbers from 2-9 are also really important. Children should continue using bonds to calculate up to 20 and beyond e.g. 11 + 9 = 20 because I know 1 + 9 = 10 , 34 + 6 = 40 because I know 4 + 6 = 10. Do lots of work to make connections from work on place value to the rest of the number system 'if I know… I know…' e.g. If I know 5 + 5= 10, 5 + 6 = 11; If I know 4 + 6 = 10, 4 + 7 must = 11. There are other links to be made using procedural variation: 4 + 6 = 10, 14 + 6 = 20, 24 + 6 = 30. Model whole-part relationships using Numicon, Ten Frames, Cuisenaire rods (where white = 1) and you might introduce base ten. Draw as bar models. ***Solve one-step problems that involve addition and subtraction, using concrete objects & pictorial representations, and missing number problems such as 7 + ? = 9; 10 = ? + 3*** *NB. Talk about 'subtract' rather than going for 'take away' or 'find the difference' which are strategies to be explored explicitly.* Strategies to be gradually introduced to get children calculating, not counting: -Quick adds which do not involve bridging 10 e.g. 20 + 7 then 23 + 6 'because I know 3 + 6 = 9' -Quick subtractions e.g. 20 – 7 must be 13 because 10 – 7 = 3. Use concrete manipulatives, the number line image and whole/part models to support this. -Adding strings of numbers by making bonds or finding doubles (law of commutativity explored and flexibility encouraged e.g. we would do 7 + 5 + 3 by adding 7 and 3 to make 10 then 5 more is 15). -Add or subtract 10 to two digit numbers using spider counting (reinforced with Numicon tiles as concrete) and multiples of 10. Can any children add nearly numbers such as 9 by adding 10 and subtracting 1? The 100 square is the key image for this. **Add and subtract numbers which bridge by partitioning the single digit in different ways 10 e.g. 27 + 5 = 27 + 3 + 2; 23 – 7 = 27 – 3 – 4 This strategy needs lots of exploration. A number line might be a useful pictorial representation, or using Numicon tiles. This is the main area that might need further development from the Spring term.** Solve subtraction problems using two strategies: take away and find the difference Pose problems that lend themselves to taking away (calculating using known facts not counting back!) e.g. 65 – 5; 65 – 10; 65 - 11 Pose problems that lend themselves to finding the difference (where numbers are quite close together e.g. 25 – 23 (the difference between 5 and 3 is 2!) A number line or Numicon may be useful for 'finding the difference'. A 100 square is useful for 'taking away'. Check subtractions with the inverse. Write calculations in different ways and explore these using Numicon and balance scales e.g. 13 = ? + 4 ; 3 + 5 = ? – 2; and 2 + 5 > ? - 2 ***Measure and begin to record the following: lengths and heights; mass/weight; capacity and volume*** Use whichever measure will provide an interesting opportunity to add, subtract and compare amounts.

Timing		Fluency	Destinations for reaching expected Y1 level with teaching notes.
SUMMER	3 WEEKS	Count in 2s, 5s and 10s.	**Calculating, Patterns & Algebra X and Division** ***Spring review: There is no emphasis in the Y1 or Y2 Curriculum on doubling but time should be spent on doubling numbers to 10, or 12, and then to the inverse: halving.*** ***Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.*** Present children with some division problems which require 'fair sharing' e.g. 'one for you, one for you, one for you…' Children usually have a firm grasp of 'what's fair' but may not be totally secure with this from Reception. Children may see division as 'sharing' so halving needs explicit teaching as viewing the number or amount 'in two groups'. It is linked to fractions work in the next unit. Look at doubling as 'two groups of' which is based on the idea of 'unitisation' where you count in 'groups of' a number. Numicon tiles are very useful for this and you can also use balance scales to show that 4 + 4 = 2 X 4 = 8. Spend time discussing what the X symbol represents. It is not explicit in the Y1 curriculum that they must understand this symbol but they should understand this as 'four add four is equivalent to two groups of 4'. ***Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.*** Present children with some division problems which suit 'grouping' as a strategy but using multiples with which they are not as familiar (e.g. 3 or 4). This will ensure the children deepen their understanding of the strategies involved in multiplying and dividing. Use whatever concrete resources you think will encourage children to develop grouping and 'counting in groups of'. Use Cuisenaire rods to show step counting 'how many 3s are equivalent to 15'. Represent this pictorially with a bar model showing whole-equal parts. Create arrays to solve multiplication or division word problems. NB If we are dividing by 3 then we should draw our array in 3s until we reach our total, rather than drawing 15 dots then making rings round them in 3s! Solve problems by creating arrays, using Cuisenaire rods to show 'how many 3s make 12', counting on a number line (repeated addition) or using known and related facts. Represent this with a bar model showing whole-equal parts. Children should always be encouraged to use facts they know to link to solutions.

Timing		Fluency	Destinations for reaching expected Y1 level with teaching notes.
SUMMER	2 WEEKS	Recall and use addition and subtraction facts for numbers to 20 fluently. Count in 5s round a clock face to 60 minutes.	**Measures: Time** ***Recognise and use language relating to dates, including the days of the week, weeks, months and years.*** Use time lines, placing days of the week or months of the year in order, starting in different places. Chant these at any opportunity. Use a time line to place times of the day including O'clock, and half past the hour. Link to fractions work in the Autumn and Spring. ***Tell the time to the hour and half past the hour and draw hands on the clock face to show these times.*** Use an analogue clock to show the hour hand and how it moves slowly all the time. Then introduce the minute hand. See if they can estimate one minute closing their eyes and putting their hand up when they think a minute has passed. Talk about how there are 60 minutes in the hour and our clocks are marked in 5 minutes. 15 minutes = quarter past, 30 minutes = half past and 45 minutes = quarter to the next hour. Use the language 'past' and 'to' and when we use these different words.
SUMMER	1 WEEK	Rehearse mental addition and subtraction strategies.	**The Number System, Calculating, Patterns & Algebra Checkup!** *Look back over all number system and calculating units of work, objectives and 'destinations'. Consider which need more work. It may be that practice and repetition of bonds and 'the story of' needs to be embedded before the long holiday and transition to Y2. Alternatively, if these bonds are secure, it might be that calculation strategies for subtraction, for example, are needed. Can children answer questions on all four operations (but particularly addition and subtraction) which are posed in different ways e.g.* - Word problems - Number sequences - Missing number equations with empty circles instead of boxes (things like this can throw them!) - Equations with the = symbol or an expression on either side of the = e.g. 4 + 1 = ? + 3