



Toner Avenue whole school MATHS progression document

Place Value

	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Place Value: Counting	<p>Chanting Autumn 1 Counting objects that can't be moved</p> <p>Spring 1 Chanting More and less</p> <p>Spring 2 How many 1-1 counting How many altogether?</p> <p>Summer 1 Counting objects that can't be moved Counting actions One more, one less</p> <p>Summer 2</p>	<p>It's me! 1, 2, 3 -Representing Light and dark (4+5)</p> <p>Autumn Alive in 5! -One less Growing 6, 7, 8! -Composition Building 9 and 10</p> <p>Spring To 20 and beyond -missing numbers Find my pattern -Doubling</p> <p>Summer</p>	<p>- count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number</p> <p>- count, numbers to 100 in numerals; count in multiples of twos, fives and tens</p> <p>Autumn 1 and 2, Spring 2, Summer 2</p>	<p>- count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward</p> <p>Autumn 1, Spring 1, Summer 1 and 2</p>	<p>- count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number</p> <p>Autumn 1, Summer</p>	<p>- count in multiples of 6, 7, 9, 25 and 1000</p> <p>- count backwards through zero to include negative numbers</p> <p>Autumn 1, Spring 1</p>	<p>- count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000</p> <p>- count forwards and backwards with positive and negative whole numbers, including through zero</p> <p>Autumn 1, Spring 1, Summer 1</p>	
Place Value: Represent	<p>Introduction to number Zoo numerals Recording to represent number</p> <p>Autumn 2 Matching number to the amount</p> <p>Spring 1 Introduction to number Zoo numerals Recording to represent number Matching number to amount</p> <p>Summer 1 Matching number to amount</p> <p>Summer 2</p>	<p>Just Like Me! -Matching buttons and shapes -Compare size</p> <p>It's me! 1, 2, 3 -Representing -Matching/comparing</p> <p>Light and dark (4+5) -Representing</p> <p>Autumn Alive in 5! Growing 6, 7, 8! Building 9 and 10</p> <p>Spring To 20 and beyond</p> <p>Summer</p>	<p>- 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, least</p> <p>- read and write numbers from 1 to 20 in numerals and words.</p> <p>- read and write numbers to 100 in numerals</p> <p>Autumn 1 and 2, Spring 2, Summer 2</p>	<p>- read and write numbers to at least 100 in numerals and in words</p> <p>- identify, represent and estimate numbers using different representations, including the number line</p> <p>Autumn 1, Spring 1, Summer 1 and 2</p>	<p>- identify, represent and estimate numbers using different representations</p> <p>- read and write numbers up to 1000 in numerals and in words</p> <p>Autumn 1, Summer</p>	<p>- identify, represent and estimate numbers using different representations</p> <p>- read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value.</p> <p>Autumn 1, Spring 1</p>	<p>- read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit</p> <p>- read Roman numerals to 1000 (M) and recognise years written in Roman numerals.</p> <p>Autumn 1, Spring 1, Summer 1</p>	<p>- read, write, (order and compare) numbers up to 10 000 000 and determine the value of each digit</p> <p>Autumn 1, Summer 2</p>



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Place Value

	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Place Value: Use PV and compare	More and less Comparing amounts Autumn 1 Comparing amounts Spring 2	Just Like Me! -Matching lids -Compare size Autumn Alive in 5! -Comparing -Unequal groups Growing 6, 7, 8! -One more and less Building 9 and 10 Spring To 20 and beyond First, then, now On the move -Equip compare Summer	- given a number, identify one more and one less Autumn 1 and 2, Spring 2, Summer 2	- recognise the place value of each digit in a two-digit number (tens, ones) - compare and order numbers from 0 up to 100; use <, > and = signs Autumn 1, Spring 1, Summer 1 and 2	- recognise the place value of each digit in a three-digit number (hundreds, tens, ones) - compare and order numbers up to 1000 Autumn 1, Summer	- find 1000 more or less than a given number - recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) - order and compare numbers beyond 1000 Autumn 1, Spring 1	- (read, write,) order and compare numbers to at least 1 000 000 and determine the value of each digit Autumn 1, Spring 1, Summer 1	- (read, write), order and compare numbers up to 10 000 000 and determine the value of each digit Autumn 1, Summer 2
Place Value: Problems and Rounding		On the move Summer		- use place value and number facts to solve problems Autumn 1, Spring 1, Summer 1 and 2	- solve number problems and practical problems involving these ideas. Autumn 1, Summer	- round any number to the nearest 10, 100 or 1000 - solve number and practical problems that involve all of the above and with increasingly large positive numbers Autumn 1, Spring 1	- interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero - round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 - solve number problems and practical problems that involve all of the above Autumn 1, Spring 1, Summer 1	- round any whole number to a required degree of accuracy - use negative numbers in context, and calculate intervals across zero - solve number and practical problems that involve all of the above. Autumn 1, Summer 2



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Place Value Mental skills and knowledge

Year 1	Year 2	Year 3
<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number count, read and write numbers to 100 in numerals count in multiples of twos, fives and tens read and write numbers from 1 to 20 in numerals and words. <p>As you use less equipment and become more visual and abstract, this can be done as m+o starters</p> <ul style="list-style-type: none"> 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, least <p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u></p> <p>Once these have been taught, any of the objectives can be covered again in m+o to remind the children, but these are the obvious m+o objectives</p> <ul style="list-style-type: none"> All of the above often and regularly including outside of this unit and outside of the maths lesson This will start with lots of equipment, then move to equipment and a visual representation and then move to being more abstract - CPA is essential - refer to it - this is all building blocks to mental understanding. <p><u>Efficiency/accuracy points to be made</u></p> <ul style="list-style-type: none"> Use of equipment for the foundation is essential - using number squares, partitioning arrows/counters, diennes - all of this needs to build up to visual representations (number lines etc) so that they can the abstractly achieve this Practice often, outside of this unit and outside of a 'maths lesson'. (When comparing numbers, use the comparison symbols) When moving onto number lines, think about how this will need to progress - moving in jumps of one, to 2 etc CPA approach to support these mental strategies is essential! <p><u>Fast recall to be taught by the end of the year</u></p> <p>Count in steps of 2, 5 and 10 - building blocks for multiplication/division unit and times tables in following year groups.</p> <p>Read and write numbers to 20, words and numerals.</p>	<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward recognise the place value of each digit in a two-digit number identify, represent and estimate numbers using different representations, including the <u>number line</u> use <, > and = signs for numbers 0-100 read and write numbers to at least 100 in numerals and in words <p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u></p> <p>Once these have been taught, any of the objectives can be covered again in m+o to remind the children, but these are the obvious m+o objectives</p> <ul style="list-style-type: none"> All of the above often and regularly including outside of this unit <p><u>Efficiency/accuracy points to be made</u></p> <ul style="list-style-type: none"> Use of equipment for the foundation block is essential - using number squares, partitioning arrows/counters, diennes - all of this needs to build up to visual representations (number lines, partitioning diamond etc) so that they can the abstractly achieve this Practice often, outside of this unit and outside of a 'maths lesson'. When comparing numbers, use the comparison symbols CPA approach to support these mental strategies is essential! <p><u>Fast recall to be taught by the end of the year</u></p> <p>Count in steps of 2, 3, 5 and 10 - building blocks for multiplication/division unit and times tables in following year groups.</p> <p>Read one and two digit numbers and know the value of the digits in the units and 10s.</p>	<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> Counting in multiples of 4, 8, 50 and 100 (4 and 8 times table) Use equipment for finding (practical dienes etc, then visual numer square, then place value chart and then jotting the number, then expect that they can do this mentally) 10 and 100 more Partition numbers, initially with equipment, then using jottings and then being able to do this orally <p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u></p> <p>Once these have been taught, any of the objectives can be covered again in m+o to remind the children, but these are the obvious m+o objectives</p> <ul style="list-style-type: none"> Count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number Read numbers up to 1000 in numerals and in words <p><u>Efficiency/accuracy points to be made</u></p> <ul style="list-style-type: none"> Make clear the links between counting in 4s and 8s and the link between counting in 50s and 100s. Ensure you start at different points not always 0, count backwards. Include examples of 'I start at 16 and count in 4s three more steps - which number will I count up to?' for GD When comparing numbers, use the comparison symbols CPA approach to support these mental strategies is essential! <p><u>Fast recall to be taught by the end of the year</u></p> <p>4 and 8 times tables</p> <p>Read three digit numbers and know the value of the digits in the units, 10s and 100s.</p>



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Place Value Mental skills and knowledge

Year 4	Year 5	Year 6
<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> Count in multiples of 6, 7, 9, 25 and 1000 - this can be done as a whole class and then table competitions, starting at different numbers etc Count backwards through zero to include negative numbers - as above - use number line visual for support Find 1000 more or less than a given number - use place value chart to do this, move onto crossing the thousand barrier in time always with visual/jotting method Round numbers (after using number lines to understand, underline the place value rounding to and circle the column affecting it) <p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u></p> <p>Once these have been taught, any of the objectives can be covered again in m+o to remind the children, but these are the obvious m+o objectives</p> <ul style="list-style-type: none"> Count in multiples of 6, 7, 9, 25 and 1000 Find 1000 more or less than a given number Count backwards through zero to include negative numbers <p><u>Efficiency/accuracy points to be made</u></p> <ul style="list-style-type: none"> Make sure they are keeping up with how many of a multiple they have used when chanting (using fingers) - otherwise it's not going to be applicable. Use a place value chart and visual to add/subtract 1000, especially when crossing the boundary - then it will become an embedded mental skill as they can 'see' it. If this needs to be with equipment for some then use equipment. Use a number line for rounding - encourage children to have their own number line in their head - describe your own - this way again it becomes an embedded mental maths skill. Until then - get them to draw the empty number line as a starting point, not start with the rhyme until they have visualised rounding. <p><u>Fast recall to be taught by the end of the year</u></p> <p>Know the number value of the Roman numerals I, V, X, L and C 6, 7 and 9 times tables</p>	<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> Count in multiples of 10, 100, 1000, 10,000 and 100,000 - this can be done as a whole class and then table competitions, starting at different numbers etc Find power of 10 multiples more or less than a given number - use place value chart to do this, move onto crossing the thousand barrier in time always with visual/jotting method Count backwards and forwards through zero to include negative numbers - as above - use number line visual for support Round numbers (underline the place value rounding to and circle the column affecting it) <p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u></p> <p>Once these have been taught, any of the objectives can be covered again in m+o to remind the children, but these are the obvious m+o objectives</p> <ul style="list-style-type: none"> Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 Count forwards and backwards with positive and negative whole numbers, including through zero <p><u>Efficiency/accuracy points to be made</u></p> <ul style="list-style-type: none"> Use a place value chart and visual to add/subtract powers of 10, especially when crossing the boundary - then it will become an embedded mental skill as they can 'see' it. If this needs to be with equipment for some then use equipment. Use a number line for rounding - encourage children to have their own number line in their head - describe your own - this way again it becomes an embedded mental maths skill. Until then - get them to draw the empty number line as a starting point, not start with the rhyme until they have visualised rounding. <p><u>Fast recall to be taught by the end of the year</u></p> <p>Know the number value of the Roman numerals I, V, X, L, C, D, M (My Dear Cat Loves Xtra Vitamins Intensely)</p>	<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> Count backwards and forwards through zero to include negative numbers - as above - use number line visual for support Round numbers in a variety of different ways incl different decimal positions (underline the place value rounding to and circle the column affecting it) Ensure they can apply multiples of 10 (commutativity) to different calculations Look at applied place value problems <p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u></p> <p>Once these have been taught, any of the objectives can be covered again in m+o to remind the children, but these are the obvious m+o objectives</p> <ul style="list-style-type: none"> read, write, order and compare numbers up to 10 000 000 and determine the value of each digit round any whole number to a required degree of accuracy use negative numbers in context, and calculate intervals across zero <p><u>Efficiency/accuracy points to be made</u></p> <ul style="list-style-type: none"> Use a place value chart and visual to add/subtract powers of 10, especially when crossing the boundary - then it will become an embedded mental skill as they can 'see' it. If this needs to be with equipment for some then use equipment. Use a number line for rounding - encourage children to have their own number line in their head - describe your own - this way again it becomes an embedded mental maths skill. Until then - get them to draw the empty number line as a starting point, not start with the rhyme until they have visualised rounding. Then move onto rounding using underlining the place value in question and circling the place value it effects <p><u>Fast recall to be taught by the end of the year</u></p> <p>Recap the number value of the Roman numerals I, V, X, L, C, D, M (My Dear Cat Loves Xtra Vitamins Intensely)</p>



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Addition and Subtraction

	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Addition and Subtraction: Recall, representation, use	<p>One more and one less Spring 1 One more and one less Summer 2</p>	<p>Just Like Me! -Matching socks -memory games Light and dark (4+5) -Composition Autumn</p> <p>Alive in 5! -Composition -One less Growing 6,7,8! -one more and less Building 9 and 10 Spring</p> <p>To 20 and beyond -Ten frame deal -Ten Frame Subtraction First, then, now Summer</p>	<p>- read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs - represent and use number bonds and related subtraction facts within 20</p>	<p>- recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 - show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot - recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.</p>	<p>- estimate the answer to a calculation and use inverse operations to check answers</p>	<p>- estimate and use inverse operations to check answers to a calculation</p>	<p>- use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy</p>	
			Autumn 1 and 2, Spring 1, Summer 2	Autumn 1, Spring 1, Summer 1	Autumn 1, Spring 1, Summer 1	Autumn 1, Spring 1, Summer	Autumn 1, Spring 1, Summer	



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Addition and Subtraction Mental skills and knowledge

Year 1	Year 2	Year 3
<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> Doubles of single digits (and corresponding halves) - lots of equipment and visuals Number bonds to 10 and 20 (and 100) and applying - $3 + 7 = 10$; $10 - 7 = 3$ and $7 = 10 - 3$ and use to calculate $13 + 7 = 20$ Number stories - similar to bonds to 10 and 20, but with all numbers eg $7 = 3+4$ and $1+6$ and $2+5$ and $7+0$ and $9 + 7 = 16$; $16 - 7 = 9$; $7 = 16 - 9$ Adding one and two digit numbers to 20 - using a variety of practical and visual equipment to support mental maths. Addition and subtraction inversing - use bar model, numicon etc - pupils to fill in bar models and write as number sentences <p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u> Once these have been taught, any of the objectives can be covered again in m+o to remind the children, but these are the obvious m+o objectives Pupils should be taught to:</p> <ul style="list-style-type: none"> represent and use number bonds and related subtraction facts within 20 add and subtract one-digit and two-digit numbers to 20, including zero <p><u>Efficiency/accuracy points to be made</u></p> <ul style="list-style-type: none"> Empty number lines so they can practice this and number lines becomes a maths tool they have in their head - think about the jumps - starting with jumps of one but working towards bigger jumps Commutativity - PAUSE and think about the numbers - how should we add, which number should we add to first etc Think about the practical and visual ways they are adding and subtracting - use CPA policy - work progressively from equipment to visual and equipment alongside, to just visual and then abstract. Make this apparent in books (though notes children write in their book, learning objective sticker etc) - CPA approach to support these mental strategies is essential! 	<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> Doubles of single digits (and corresponding halves) - children will then recognise this and make their mental addition more efficient eg $4 + 4$ double 4 is 8 so the answer is 8 or $8 - 4 = 4$ I know double 4 is 8 so the answer is 4 Using empty number lines so they can practice this and number lines becomes a maths tool they have in their head - think about the jumps - starting with jumps of one but working towards bigger jumps Number bonds to 10 and 20 (and 100) and applying - $3 + 7 = 10$; $10 - 7 = 3$ and $7 = 10 - 3$ to calculate $30 + 70 = 100$; $100 - 70 = 30$ and $70 = 100 - 30$ and to also calculate $13 + 7 = 20$ Number stories - similar to bonds to 10, but with all numbers eg $7 = 3+4$ and $1+6$ and $2+5$ and $7+0$ Commutativity - using bonds to make it easier - $3 + 6 + 7 =$ would be better as $3 + 7 + 6 = 10 + 6 = 16$ - PAUSE and think about the numbers Addition and subtraction inversing - use bar model - pupils to fill in bar models and write as number sentences - <p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u> Once these have been taught, any of the objectives can be covered again in m+o to remind the children, but these are the obvious m+o objectives Pupils should be taught to:</p> <ul style="list-style-type: none"> recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 add and subtract numbers using concrete objects, pictorial representations, and mentally, including: <ul style="list-style-type: none"> a two-digit number and ones a two-digit number and tens two two-digit numbers adding three one-digit numbers show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot recognise and use the inverse relationship between addition and subtraction <p><u>Efficiency/accuracy points to be made</u></p> <ul style="list-style-type: none"> Think about the practical and visual ways they are adding and subtracting - use CPA policy - work progressively from equipment to visual and equipment 	<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> Number stories - to do $4 + 7$ we can take the 6 from the 7 to make 10 and with one left from the 7 it makes 11 ($4 + 6 + 1 = 11$). This is key to improving all the following addition skills. Start off with what two numbers make 7 and list them, then start to apply to addition and then subtraction. Move on from put the number in your head and count on as soon as possible. Doubles of single digits (and corresponding halves) - children will then recognise this and make their mental addition more efficient eg $234 + 4$ double 4 is 8 so the answer is 238 Using empty number lines so they can practice this and number lines becomes a maths tool they have in their head Number bonds to 10 (and 100) Eventually adding units, 10s and 100s to three digit numbers will be a m+o starter using jottings to move to abstract ability <p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u> Once these have been taught, any of the objectives can be covered again in m+o to remind the children, but these are the obvious m+o objectives Pupils should be taught to:</p> <ul style="list-style-type: none"> add and subtract numbers mentally, including: <ul style="list-style-type: none"> a three-digit number and ones a three-digit number and tens a three-digit number and hundreds use inverse operations <p><u>Efficiency/accuracy points to be made</u></p> <ul style="list-style-type: none"> After using practical equipment and visuals such as place value chart, jottings are the step to move onto abstract for adding units, 10s and 100s to three digit numbers Crossing the units/tens barrier will need daily practice, especially initially Always refer to numbers as their actual value in written methods - $456 + 345 =$ will be $50 + 40$ is 90 not $5 + 4 = 9$ etc



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<ul style="list-style-type: none"> Think about how your visual representations are progressing, especially number lines - the jumps that they are using <p><u>Fast recall to be taught by the end of the year</u> Know the effect of adding or subtracting a 0 Memorise number bonds to 10 and 20 Count forwards and backwards 0-100 (in steps of 1 to add/subtract, but also 2, 5 and 10 from previous unit) Know the doubles and corresponding halves for single digit numbers</p>	<p>alongside, to just visual and then abstract. Make this apparent in books (though notes children write in their book, learning objective sticker etc)</p> <ul style="list-style-type: none"> Always refer to numbers as their actual value- $23 + 5 =$ will be $20 + 3 + 5$ is 28 not $2 + 3 + 5 =$ etc Think about how your visual representations are progressing, especially number lines - the jumps that they are using Really work on children knowing where the highest/lowest value number is in addition and subtraction number sentences - bar model CPA approach to support these mental strategies is essential! <p><u>Fast recall to be taught by the end of the year</u> Know number stories for single digits Know the doubles and corresponding halves for single digit numbers Number bonds to 10 and 20 (and 10s multiples of 100 using number bonds to 10)</p>	<ul style="list-style-type: none"> Use the bar model to show inverse operations CPA approach to support these mental strategies is essential! <p><u>Fast recall to be taught by the end of the year</u> Know number stories for single digits Know the doubles and corresponding halves for single digit numbers Number bonds to 10 (and 100)</p>
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Addition and Subtraction Mental skills and knowledge

Year 4	Year 5	Year 6
<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> Number stories to add single digit numbers - eg $5 + 7 = (5 + 5 + 2 = 12)$ or $(2 + 3 + 7 = 12)$ - build up with jottings until it is mentally drawn upon Adding two digit number to a two digit number by using partitioning - $34 + 53 = 30 + 50 + 4 + 3 = 87$ Using doubles knowledge to add or subtract $8 + 8 =$, $12 - 6 =$ Subtracting from a two digit number - can it be partitioned? $45 - 12 =$ yes $56 - 27 =$ no use an empty number line - this must be drawn with jottings so eventually it becomes a visual they draw upon mentally - discuss their own number line <p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u> See above - not within an 'objective' but important skills to support understanding and formal methods</p> <p><u>Efficiency/accuracy points to be made</u></p> <ul style="list-style-type: none"> Always refer to numbers as their actual value in written methods - $3456 + 2345 =$ will be $50 + 40$ is 90 not $5 + 4 = 9$ 	<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> Number stories to add single digit numbers - eg $5 + 7 = (5 + 5 + 2 = 12)$ or $(2 + 3 + 7 = 12)$ - build up with jottings until it is mentally drawn upon Adding two digit number to a two digit number by using partitioning - $34 + 53 = 30 + 50 + 4 + 3 = 87$ - applied to larger numbers Using doubles knowledge to add or subtract $8 + 8 =$, $12 - 6 =$ - applied to larger numbers Subtracting from a two digit number - can it be partitioned? $45 - 12 =$ yes $56 - 27 =$ no use an empty number line - this must be drawn with jottings so eventually it becomes a visual they draw upon mentally - discuss their own number line - applied to larger numbers Use nearly numbers to add and subtract - $23 + 19 = 23 + 20 - 1$ and $45 - 18 = 45 - 20 + 2$ applied to larger numbers <p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u></p> <ul style="list-style-type: none"> Add and subtract numbers mentally with increasingly large numbers 	<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> Recap all time tables Recall number stories to add single digit numbers - eg $5 + 7 = (5 + 5 + 2 = 12)$ or $(2 + 3 + 7 = 12)$ - build up with jottings until it is mentally drawn upon Revise adding two digit number to a two digit number by using partitioning - $34 + 53 = 30 + 50 + 4 + 3 = 87$ - applied to larger numbers Revise using doubles knowledge to add or subtract $8 + 8 =$, $12 - 6 =$ - applied to larger numbers Revise subtracting from a two digit number - can it be partitioned? $45 - 12 =$ yes $56 - 27 =$ no use an empty number line - this must be drawn with jottings so eventually it becomes a visual they draw upon mentally - discuss their own number line - applied to larger numbers Revise times tables, square numbers and cube numbers (using partitioning jottings to do this mentally) Revise using a place value grid to multiply and divide by 10, 100 and 1000 Revise apply times tables to multiples of 10 ($3 \times 4 = 12$ so $30 \times 4 = 120$ so $30 \times 40 = 1200$) Revise how to multiply three numbers together eg $2 \times 3 \times 6$ - which order is most efficient? $(3 \times 6) \times 2$ - easier to double. With $5 \times 4 \times 7 - (5 \times 7) \times 4$ - how can we multiply 35 by 4 - double and double again. With $3 \times 7 \times 9 - (7 \times 9) \times 3$ - how can we multiply 63 by 3 - 60×3 and then 3×3 and combine (partitioning). This links with distributive law. Use nearly numbers to add and subtract - $23 + 19 = 23 + 20 - 1$ and $45 - 18 = 45 - 20 + 2$ applied to larger numbers Draw factor flowers to find factor pairs, common factors, common multiples, factor primes etc BODMAS ordering



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<ul style="list-style-type: none">• When teaching inversing of + and - use block method. This will help children visualise the number sentence. It will especially help when working out $___ - 56 = 12$ vs $67 - ___ = 15$• Give children a mix of formal and mental problems so they choose the most effective method• Display calculations and discuss the most efficient method <p><u>Fast recall to be taught by the end of the year</u> Doubles to add and subtract Bonds to 10, 100 and 1 Number stories (drawing on bonds to 10)</p>	<p><u>Efficiency/accuracy points to be made</u></p> <ul style="list-style-type: none">• Teach how to choose the most efficient method• Give children a mix of formal and mental problems so they choose the most effective method• Display calculations and discuss the most efficient method <p><u>Fast recall to be taught by the end of the year</u> Doubles to add and subtract applied to larger numbers Bonds to 10, 100 and 1 Number stories (drawing on bonds to 10)</p>	<p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u></p> <ul style="list-style-type: none">▪ perform mental calculations, including with mixed operations and large numbers▪ identify common factors, common multiples and prime numbers▪ use their knowledge of the order of operations to carry out calculations involving the four operations <p><u>Efficiency/accuracy points to be made</u></p> <ul style="list-style-type: none">• Teach how to choose the most efficient method• Give children a mix of formal and mental problems so they choose the most effective method• Display calculations and discuss the most efficient method <p><u>Fast recall to be taught by the end of the year</u> Prime numbers below 20 Square and cubed numbers from $1^{2/3}$ to $12^{2/3}$ Revise - Doubles to add and subtract applied to larger numbers, Bonds to 10, 100, 1 and 0.1 and Number stories (drawing on bonds to 10)</p>
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Multiplication and Division

	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Multiplication and Division: Recall, representation, use		Find my pattern -Doubling Summer		<ul style="list-style-type: none"> - recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers - show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot 	<ul style="list-style-type: none"> - recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables 	<ul style="list-style-type: none"> - recall multiplication and division facts for multiplication tables up to 12×12 - use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers - recognise and use factor pairs and commutativity in mental calculations 	<ul style="list-style-type: none"> - identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers - know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers - establish whether a number up to 100 is prime and recall prime numbers up to 19 - recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3) 	<ul style="list-style-type: none"> - identify common factors, common multiples and prime numbers - use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy
				Autumn 1, Spring 1, Summer 1	Autumn 1, Spring 1, Summer 1	Autumn 2, Spring 2, Summer	Autumn 2, Spring 2	Autumn 1, Spring 1, Summer 2



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Multiplication and Division

	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Multiplication and Division: Calculations				<ul style="list-style-type: none"> - calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals ($=$) signs 	<ul style="list-style-type: none"> - write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods 	<ul style="list-style-type: none"> - multiply two-digit and three-digit numbers by a one-digit number using formal written layout 	<ul style="list-style-type: none"> - multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers - multiply and divide numbers mentally drawing upon known facts - divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context - multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 	<ul style="list-style-type: none"> - multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication - divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context - divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context - perform mental calculations, including with mixed operations and large numbers
				Autumn 1, Spring 1, Summer 1	Autumn 1, Spring 1, Summer 1	Autumn 2, Spring 2, Summer	Autumn 2, Spring 2	Autumn 1, Spring 1, Summer 2



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Multiplication and Division

	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Multiplication and Division: Solve problems			<p>- 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.</p> <p>Spring 1 and 2, Summer 1</p>	<p>- solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.</p> <p>Autumn 1, Spring 1, Summer 1</p>	<p>- solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.</p> <p>Autumn 1, Spring 1, Summer 1</p>	<p>- solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.</p> <p>Autumn 2, Spring 2, Summer</p>	<p>- solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes</p> <p>- solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.</p> <p>Autumn 2, Spring 2</p>	<p>- solve problems involving addition, subtraction, multiplication and division</p> <p>Autumn 1, Spring 1, Summer 2</p>
Multiplication and Division: Combined Operations							<p>- solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign</p> <p>Autumn 2, Spring 2</p>	<p>- use their knowledge of the order of operations to carry out calculations involving the four operations</p> <p>Autumn 1, Spring 1, Summer 2</p>



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Multiplication and Division Mental skills and knowledge

Year 1	Year 2	Year 3
<p><u>Starting points - Mental and oral areas to support the objectives</u> Lots of concrete opportunities and lots of visual representations for the following -</p> <ul style="list-style-type: none"> Doubles of single digits (and corresponding halves) - lots of equipment and visuals Make connections between arrays, number patterns, and counting in twos, fives and tens. Count in steps of (and begin to recall) and chanting of 2, 5 and 10 times tables <p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u> Once these have been taught, any of the objectives can be covered again in m+o to remind the children, but these are the obvious m+o objectives</p> <ul style="list-style-type: none"> x and ÷ concrete objects, pictorial representations and arrays with the support of the teacher. <p><u>Efficiency/accuracy points to be made</u></p> <ul style="list-style-type: none"> CPA approach - lots of exposure <p><u>Fast recall to be taught by the end of the year</u> Begin to know 2, 5 and 10 multiples through practical, visuals, chanting, exposure etc Begin to know doubles (and halves) through practical, visuals, prompting, exposure etc</p>	<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> Recall and chanting of 2, 5 and 10 times tables Know odds and evens - use equipment (numicon for example) then apply to all numbers - fast recall style Doubles of single digits (and corresponding halves) Use commutativity to choose how to multiply - PAUSE and think Use inverse relations to develop multiplicative reasoning- know the inverse of multiplication sentences (for example, $4 \times 5 = 20$ and $20 \div 5 = 4$) - ingrained links that multiplication supports division <p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u> Once these have been taught, any of the objectives can be covered again in m+o to remind the children, but these are the obvious m+o objectives</p> <ul style="list-style-type: none"> recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables recognising odd and even numbers multiplication of two numbers can be done in any order (commutative) but division cannot calculate mathematical statements for multiplication and division within the multiplication <p><u>Efficiency/accuracy points to be made</u></p> <ul style="list-style-type: none"> Make clear the links between counting in 5s and 10s Use 10 times table and place value chart/number square hand in hand Use clock face for counting in 5s - will support both 5x and telling the time Really work on children knowing where the highest value number is in a multiplication and division number sentence (Find quarters/dividing by 4 by halving and halving again) <p><u>Fast recall to be taught by the end of the year</u> Know 2, 5 and 10 times tables Know and identify odd/even numbers Know inverse of multiplication and division number sentences</p>	<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> Recap halves and quarters of amounts (and can start $\frac{1}{2}$) Recall and chanting of 2, 3, 4 and 8 times tables and 5 and 10 Times tables as above and their inverse known division facts (how many 8s in 24 etc) Use place value chart to show how to make a number 10 times bigger Multiplying multiples of 10 by 2, 3, 4 and 8 - $30 \times 4 = 120$ Partitioning 2 digit numbers to then multiply the components by 2, 3, 4 and 8 and adding together to find the answer - $24 \times 3 = 20 \times 3$ and 4×3 so $60 + 12 = 72$ (this is the end game) Multiples of 10 to divide eg $60 \div 3 = 20$ because $6 \div 3 = 2$ Fractions of amounts ($\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{6}$, $\frac{1}{10}$) linking to fractions work <p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u> Once these have been taught, any of the objectives can be covered again in m+o to remind the children, but these are the obvious m+o objectives</p> <ul style="list-style-type: none"> Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables <p><u>Efficiency/accuracy points to be made</u></p> <ul style="list-style-type: none"> Make clear the links between counting in 4s and 8s Never, ever allow add a 0! Always refer to numbers as their actual value in written methods - $42 \times 6 =$ will be 40×6 is 240 not $4 \times 6 = 24$ Find quarters/dividing by 4 by halving and halving again <p><u>Fast recall to be taught by the end of the year</u> Know 3, 4 and 8 times tables Know the multiplication and division facts for 3, 4 and 8 times tables Know how to make single and double digits 10 times bigger Apply above to qu like $50 \times 4 = 200$</p>



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Multiplication and Division Mental skills and knowledge

Year 4	Year 5	Year 6
<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> • Times tables • Using a place value grid to multiply and divide by 10, 100 and 1000 • Apply times tables to multiples of 10 ($3 \times 4 = 12$ so $30 \times 4 = 120$ so $30 \times 40 = 1200$) • How to multiply three numbers together eg $2 \times 3 \times 6$ - which order is most efficient? (3×6) $\times 2$ - easier to double. With $5 \times 4 \times 7$ - (5×7) $\times 4$ - how can we multiply 35 by 4 - double and double again. With $3 \times 7 \times 9$ - (7×9) $\times 3$ - how can we multiply 63 by 3 - 60×3 and then 3×3 and combine (partitioning). This links with distributive law. • Jottings of a factor flower - going logically from 1 and __, taught to do quickly so that it becomes a mental visualisation after much practice • Half of multiples of 10, especially 30, 50, 70, 90 (which can then be applied to half of 1, 3, 5 etc) • Half of two digit numbers by partitioning (half of 64 - half of 60, half of 4 and combine) • Find fractions of amounts (to link with fraction work below) <p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u></p> <ul style="list-style-type: none"> ▪ Multiplication tables up to 12×12 ▪ Multiplying together three numbers ▪ Using the distributive law to multiply two digit numbers by one digit <p><u>Efficiency/accuracy points to be made</u></p> <ul style="list-style-type: none"> • Applying to ten, hundred and thousand multiples of 12×12 (then onto decimals if appropriate) • Multiply by 4 by double, double • Divide by 4/quarter by half and half again • Using partitioning (distributive law) to mentally double and halve two digit numbers • Above but choosing best way to \times by 4 and 10 • Factor flowers to ensure they know the corresponding factor pairs and they have them all • Never, ever allow add a 0! • Always refer to numbers as their actual value in written methods - $342 \times 6 =$ will be 40×6 is 240 not $4 \times 6 = 24$ <p><u>Fast recall to be taught by the end of the year</u></p> <p>Times tables to 12×12 Halves of tens multiples 10, 30, 50, 70, 90 etc (and then the decimal half of 1, 3, 5, 7, 9 etc)</p>	<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> • Times tables, square numbers and cube numbers (using partitioning jottings to do this mentally) • Using a place value grid to multiply and divide by 10, 100 and 1000 • Apply times tables to multiples of 10 ($3 \times 4 = 12$ so $30 \times 4 = 120$ so $30 \times 40 = 1200$) • How to multiply three numbers together eg $2 \times 3 \times 6$ - which order is most efficient? (3×6) $\times 2$ - easier to double. With $5 \times 4 \times 7$ - (5×7) $\times 4$ - how can we multiply 35 by 4 - double and double again. With $3 \times 7 \times 9$ - (7×9) $\times 3$ - how can we multiply 63 by 3 - 60×3 and then 3×3 and combine (partitioning). This links with distributive law. • Jottings of a factor flower - going logically from 1 and __, taught to do quickly so that it becomes a mental visualisation after much practice • Half of multiples of 10, especially 30, 50, 70, 90 (which can then be applied to half of 1, 3, 5 etc) • Half of two digit numbers by partitioning (half of 64 - half of 60, half of 4 and combine) including decimal halves eg 35 • Halves of decimals incl using place holders half of 0.3 - $0.30 = 0.15$ etc <p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u></p> <ul style="list-style-type: none"> ▪ multiplication tables up to 12×12 ▪ multiplying together three numbers (incl for cubed numbers) ▪ using the distributive law to multiply two digit numbers by one digit and increasingly large numbers <p><u>Efficiency/accuracy points to be made</u></p> <ul style="list-style-type: none"> • Applying to ten, hundred and thousand multiples of 12×12 (then onto decimals if appropriate) • Multiply by 4 by double, double • Divide by 4/quarter by half and half again • Using partitioning (distributive law) to mentally double and halve two digit numbers • Above but choosing best way to \times by 4 and 10 • Factor flowers to ensure they know the corresponding factor pairs and they have them all - know what a prime number and square number factor flowers look like <p><u>Fast recall to be taught by the end of the year</u></p> <p>Prime numbers under 20 Square numbers from 1^2 to 12^2 Start to know cubed numbers</p>	<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> • Recap all time tables • Recall number stories to add single digit numbers - eg $5 + 7 = (5 + 5 + 2 = 12)$ or $(2 + 3 + 7 = 12)$ - build up with jottings until it is mentally drawn upon • Revise adding two digit number to a two digit number by using partitioning - $34 + 53 = 30 + 50 + 4 + 3 = 87$ - applied to larger numbers • Revise using doubles knowledge to add or subtract $8 + 8 =$, $12 - 6 =$ - applied to larger numbers • Revise subtracting from a two digit number - can it be partitioned? $45 - 12 =$ yes $56 - 27 =$ no use an empty number line - this must be drawn with jottings so eventually it becomes a visual they draw upon mentally - discuss their own number line - applied to larger numbers • Revise times tables, square numbers and cube numbers (using partitioning jottings to do this mentally) • Revise using a place value grid to multiply and divide by 10, 100 and 1000 • Revise apply times tables to multiples of 10 ($3 \times 4 = 12$ so $30 \times 4 = 120$ so $30 \times 40 = 1200$) • Revise how to multiply three numbers together eg $2 \times 3 \times 6$ - which order is most efficient? (3×6) $\times 2$ - easier to double. With $5 \times 4 \times 7$ - (5×7) $\times 4$ - how can we multiply 35 by 4 - double and double again. With $3 \times 7 \times 9$ - (7×9) $\times 3$ - how can we multiply 63 by 3 - 60×3 and then 3×3 and combine (partitioning). This links with distributive law. • Use nearly numbers to add and subtract - $23 + 19 = 23 + 20 - 1$ and $45 - 18 = 45 - 20 + 2$ applied to larger numbers • Draw factor flowers to find factor pairs, common factors, common multiples, factor primes etc • BODMAS ordering <p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u></p> <ul style="list-style-type: none"> ▪ perform mental calculations, including with mixed operations and large numbers ▪ identify common factors, common multiples and prime numbers ▪ use their knowledge of the order of operations to carry out calculations involving the four operations <p><u>Efficiency/accuracy points to be made</u></p> <ul style="list-style-type: none"> • Teach how to choose the most efficient method • Give children a mix of formal and mental problems so they choose the most effective method • Display calculations and discuss the most efficient method <p><u>Fast recall to be taught by the end of the year</u></p> <p>Prime numbers below 20 Square and cubed numbers from $1^{2/3}$ to $12^{2/3}$ Revise - Doubles to add and subtract applied to larger numbers, Bonds to 10, 100, 1 and 0.1 and Number stories (drawing on bonds to 10)</p>



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Fractions, Decimals and Percentages

	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Fractions: Recognise and write			<ul style="list-style-type: none"> - recognise, find and name a half as one of two equal parts of an object, shape or quantity - recognise, find and name a quarter as one of four equal parts of an object, shape or quantity. 	<ul style="list-style-type: none"> - recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity 	<ul style="list-style-type: none"> - count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10. - Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators. - Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators 	<ul style="list-style-type: none"> - count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten. 	<ul style="list-style-type: none"> - identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths - recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$] 	
			Spring and Summer 1	Autumn 2, Spring 2	Autumn 2, Spring 2, Summer 2	Autumn 2, Spring 2	Autumn 2, Spring 2, Summer 2	
Fractions: Compare				<ul style="list-style-type: none"> - recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$. 	<ul style="list-style-type: none"> - Recognise and show, using diagrams, equivalent fractions with small denominators - Compare and order unit fractions, and fractions with the same denominators 	<ul style="list-style-type: none"> - recognise and show, using diagrams, families of common equivalent fractions 	<ul style="list-style-type: none"> - compare and order fractions whose denominators are all multiples of the same number 	<ul style="list-style-type: none"> - use common factors to simplify fractions; use common multiples to express fractions in the same denomination - compare and order fractions, including fractions > 1
				Autumn 2, Spring 2	Autumn 2, Spring 2, Summer 2	Autumn 2, Spring 2	Autumn 2, Spring 2, Summer 2	Autumn 2, Spring 1, Summer 1



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Fractions, Decimals and Percentages

	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Fractions: Calculations				<p>- write simple fractions for example, $\frac{1}{2}$ of 6 = 3</p> <p>Autumn 2, Spring 2</p>	<p>- Add and subtract fractions with the same denominator within one whole [eg $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$]</p> <p>Autumn 2, Spring 2, Summer 2</p>	<p>- add and subtract fractions with the same denominator</p> <p>Autumn 2, Spring 2</p>	<p>- add and subtract fractions with the same denominator and denominators that are multiples of the same number</p> <p>- multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams</p> <p>Autumn 2, Spring 2, Summer 2</p>	<p>- add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions</p> <p>- multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$]</p> <p>- divide proper fractions by whole numbers [for example, $\frac{1}{3} \div 2 = \frac{1}{6}$]</p> <p>Autumn 2, Spring 1, Summer 1</p>
Fractions: Solve Problems					<p>Solve problems that involve all of the above.</p> <p>Autumn 2, Spring 2, Summer 2</p>	<p>- solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number</p> <p>Autumn 2, Spring 2</p>		



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Fractions, Decimals and Percentages

	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Decimals: Recognise and write						<ul style="list-style-type: none"> - recognise and write decimal equivalents of any number of tenths or hundredths - recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ <p>Spring 2</p>	<ul style="list-style-type: none"> - read and write decimal numbers as fractions [for example, $0.71 = \frac{71}{100}$] - recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents <p>Spring 2, Summer 2</p>	<ul style="list-style-type: none"> - identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places <p>Autumn 2, Spring 1, Summer 1</p>
Decimals: Compare						<ul style="list-style-type: none"> - round decimals with one decimal place to the nearest whole number - compare numbers with the same number of decimal places up to two decimal places <p>Spring 2</p>	<ul style="list-style-type: none"> - round decimals with two decimal places to the nearest whole number and to one decimal place - read, write, order and compare numbers with up to three decimal places <p>Spring 2, Summer 2</p>	



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Fractions, Decimals and Percentages

	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Decimals: Calculations and problems						<p>- find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths</p> <p>Spring 2</p>	<p>- solve problems involving number up to three decimal places</p> <p>Spring 2, Summer 2</p>	<p>- multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places</p> <p>- multiply one-digit numbers with up to two decimal places by whole numbers</p> <p>- use written division methods in cases where the answer has up to two decimal places</p> <p>- solve problems which require answers to be rounded to specified degrees of accuracy</p> <p>Autumn 2, Spring 1, Summer 1</p>



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Fractions, Decimals and Percentages

	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Fractions, Decimals and Percentages						<p>- solve simple measure and money problems involving fractions and decimals to two decimal places.</p> <p>Spring 2</p>	<p>- recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal</p> <p>- solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25.</p> <p>Spring 2, Summer 2</p>	<p>- associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $\frac{3}{8}$]</p> <p>- recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.</p> <p>Autumn 2, Spring 1, Summer 1</p>



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Fractions, Decimals and Percentages Mental skills and knowledge

Year 1	Year 2	Year 3
<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> Doubles of single digits (and corresponding halves) Fractions ($\frac{1}{2}$ and $\frac{1}{4}$) of shapes, objects and quantities using counting equipment, objects, folding paper shapes, measuring equipment etc - emphasis on equal amounts How can we make this a whole with $\frac{1}{2}$ or $\frac{1}{4}$ missing? Recognise halves and quarters of shapes visually Recognise when shapes are not halves/quarters visually because it is not equal <p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u> Once these have been taught, any of the objectives can be covered again in m+o to remind the children, but these are the obvious m+o objectives</p> <ul style="list-style-type: none"> recognise, find and name a half as one of two equal parts of an object, shape or quantity recognise, find and name a quarter as one of four equal parts of an object, shape or quantity. <p><u>Efficiency/accuracy points to be made</u></p> <ul style="list-style-type: none"> Use lots of practical equipment and visual representations - objects, pictures, shapes shaded in, pizza slices etc and a fraction wall, not to mention cuisenaire rods to support understanding <p><u>Fast recall to be taught by the end of the year</u> Begin to know doubles (and halves) through practical, visuals, prompting, exposure etc Begin to visually see if fractions are equal or not equal</p>	<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> Doubles of single digits (and corresponding halves) Fractions of amounts ($\frac{1}{2}$ and $\frac{1}{4}$) using halving recall or times tables knowledge Write the fraction of shaded shapes by counting how many parts - know that if there are 2 shaded parts out of 4 that is equivalent to $\frac{1}{2}$ <p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u> Once these have been taught, any of the objectives can be covered again in m+o to remind the children, but these are the obvious m+o objectives</p> <ul style="list-style-type: none"> SEE ABOVE <p><u>Efficiency/accuracy points to be made</u></p> <ul style="list-style-type: none"> Use lots of visual representations - objects, pictures, shapes shaded in, pizza slices etc and a fraction wall, not to mention cuisenaire rods to support understanding Know that how many parts in total is the denominator and is the bottom part of a fraction and how many parts used/shaded etc is the numerator and goes on top of the fraction Knowing doubles and corresponding halves by fast recall is essential Find quarters/dividing by 4 by halving and halving again Use comparison symbols <p><u>Fast recall to be taught by the end of the year</u> Know doubles of single digits (and corresponding halves) Find $\frac{1}{2}$, $\frac{1}{4}$ (using half and half it again) of amounts</p>	<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> Using number beads as a visual, count in tenth steps Use an empty number line to count in tenth steps Fractions of amounts ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{10}$) using times tables knowledge Write the fraction of shaded shapes (and the fraction required to make that a whole), including with numerators larger than 1 Write the fraction of different objects eg fraction of shoes that are blue/triangles/have right angles, including with numerators larger than 1 Doubles and number stories for adding and subtracting Add and subtract fractions Order and compare fractions with 1 as a numerator or all with the same denominator - use comparison symbols and place on empty number lines <p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u> Once these have been taught, any of the objectives can be covered again in m+o to remind the children, but these are the obvious m+o objectives</p> <ul style="list-style-type: none"> count up and down in tenths Recognise, find and write fractions of a discrete set of objects Add and subtract fractions with the same denominator within one whole [eg $5/7 + 1/7 = 6/7$] Compare and order unit fractions, and fractions with the same denominators <p><u>Efficiency/accuracy points to be made</u></p> <ul style="list-style-type: none"> Use number bead strings to represent tenths and use when counting in steps of tenths - they can then see the whole ones being made and using a 100 number bead string means you can start at different points like 3.4 Fractions to be covered are fractions with 'small denominators', so anything with a denominator below 10, with emphasis on $1/10$, $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{5}$ and their higher numerators ($\frac{3}{4}$ etc) Children should know the relationship between fractions and division Find quarters/dividing by 4 by halving and halving again Use bar model to look at the size of fractions - use to compare $\frac{1}{2}$ to a $\frac{1}{4}$, highlighting that with fractions the larger denominator means more parts so the value is actually lower - then link to ordering fractions. This visual will help this become a mental skill Use comparison symbols <p><u>Fast recall to be taught by the end of the year</u> Count in tenths steps from different numbers Write fractions that are represented pictorially (shaded shapes, fraction of ___ in a set of objects) Order unit fractions and fractions with the same denominator</p>

Fractions, Decimals and Percentages Mental skills and knowledge



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Year 4	Year 5	Year 6
<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> • $0.9 = 9/10$, $34/100 = 0.34$ (could refer to this as money to help) onto $0.02 = 2/100$ vs $0.2 = 2/10$ • $\frac{1}{4} = 0.25$ $\frac{1}{2} = 0.5$ $\frac{3}{4} = 0.75$ • Count up and down in hundredths and tenths - use a number bead string to show whole numbers as an initial start • Dividing one and two digit numbers by 10 and 100 using place value chart • Dividing by 2 (halving facts), 4 (half and half again), 5, 3, 10 and 100 - finding $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{10}$, $1/100$ of amounts using the denominator to divide - eventually finding higher numerators $\frac{2}{5}$ of an amount • Find fractions of amounts ($\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{6}$, $1/7$, $\frac{1}{8}$, $1/10$), including where the numerator is higher than 1 <p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u></p> <ul style="list-style-type: none"> ▪ Recognise and write decimal equivalents of any number of tenths or hundredths ▪ Recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ ▪ Round 1d.p. numbers to nearest whole number ▪ Compare numbers with the same number of decimal places up to two decimal places - use money for understanding initially <p><u>Efficiency/accuracy points to be made</u> Once these have been taught, they can be covered again in m+o to remind the children</p> <ul style="list-style-type: none"> • Use hundred beads to show ten hundredths make a tenth, ten tenths make a whole and a hundred hundredths make a whole • Finding a quarter is halving and halving again • When adding and subtracting fractions, can they simplify the answer when appropriate (using work on fraction family and fraction wall) and if it is an improper fraction can this be discussed (GD)? • They must know that finding fractions of amounts is linked to the denominator (and numerator when higher than 1) 	<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> • Decimal, fraction and percentage equivalents for $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{3}{5}$, $\frac{4}{5}$, $\frac{1}{10}$ etc and $1/100$ etc • Percentage and decimal equivalents for $/25$, $/50$ and $/75$ • Round decimals to whole number and tenth • Order and compare decimals to 3d.p. • Simplifying fractions • Find common denominators where they are multiples of the same number • Proper into improper and visa versa • Multiply proper fractions and mixed numbers by whole numbers • Fractions and percentages of amounts <p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u></p> <ul style="list-style-type: none"> ▪ Compare and order fractions whose denominators are all multiples of the same number ▪ Identify equivalent fractions ▪ Convert mixed number and improper fractions ▪ Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams ▪ recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents ▪ round decimals with two decimal places to the nearest whole number and to one decimal place ▪ read, write, order and compare numbers with up to three decimal places ▪ write percentages as a fraction with denominator 100, and as a decimal <p><u>Efficiency/accuracy points to be made</u> Once these have been taught, they can be covered again in m+o to remind the children</p> <ul style="list-style-type: none"> • Cover understanding through diagrams and then ensure pupils can fast recall facts • They must know that finding fractions of amounts is linked to the denominator (and numerator when higher than 1) • Finding a quarter is halving and halving again <p><u>Fast recall to be taught by the end of the year</u></p>	<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> • Recall decimal, fraction and percentage equivalents for $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{3}{5}$, $\frac{4}{5}$, $1/10$ etc and $1/100$ etc and calculate decimals from fractions eg $\frac{3}{5} = 3$ divided by $8 = 0.375$ and multiply decimals by whole numbers eg $0.4 \times 2 = 0.8$ • Percentage and decimal equivalents for $/25$, $/50$ and $/75$ • Round decimals to whole number and tenth • Order and compare decimals to 3d.p. and fractions that are mixed numbers • Simplifying fractions • Find common denominators where they are multiples of the same number • Proper into improper and visa versa • Multiply proper fractions and mixed numbers by whole numbers and multiply fractions by fractions • Divide proper fractions by whole numbers • Fractions and percentages of amounts • Add fractions with different denominators • Rounding (also see place value) • relationship between unit fractions and division to work backwards by multiplying a quantity that represents a unit fraction to find the whole quantity (for example, if $\frac{1}{4}$ of a length is 36cm, then the whole length is $36 \times 4 = 144$cm) - bar model • Fractions, decimals and percentages in the context of shapes <p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u></p> <ul style="list-style-type: none"> ▪ Compare and order fractions whose denominators are all multiples of the same number ▪ Identify equivalent fractions ▪ Convert mixed number and improper fractions ▪ Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams ▪ recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents ▪ round decimals with two decimal places to the nearest whole number and to one decimal place ▪ read, write, order and compare numbers with up to three decimal places ▪ write percentages as a fraction with denominator 100, and as a decimal <p><u>Efficiency/accuracy points to be made</u> Once these have been taught, they can be covered again in m+o to remind the children</p> <ul style="list-style-type: none"> • Cover understanding through diagrams and then ensure pupils can fast recall facts • They must know that finding fractions of amounts is linked to the denominator (and numerator when higher than 1) • Finding a quarter is halving and halving again <p><u>Fast recall to be taught by the end of the year</u></p>



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<p><u>Fast recall to be taught by the end of the year</u> $\frac{1}{4} = 0.25$ $\frac{1}{2} = 0.5$ $\frac{3}{4} = 0.75$ All decimals for 1/10 to 10/10 and 1/100 to 100/100 1000m = 1km, 1000g = 1kg, 1000ml = 1l, 100cm = 1m, 10mm = 1cm (and corresponding halves and quarters)</p>	<p>Decimal, fraction and percentage equivalents for $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{3}{5}$, $\frac{4}{5}$, $\frac{1}{10}$ etc and 1/100 etc Percentage and decimal equivalents for above and /25, /50 /75 and /100 and percentage equivalents for all decimals to tenths and hundredths</p>	<p>Decimal, fraction and percentage equivalents for $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{3}{5}$, $\frac{4}{5}$, $\frac{1}{10}$ etc and 1/100 etc and know how to calculate decimal from a fraction Percentage and decimal equivalents for above and /25, /50 /75 and /100 and percentage equivalents for all decimals to tenths and hundredths</p>
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Ratio and Proportion

	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Ratio and Proportion								<ul style="list-style-type: none">- solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts- solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison- solve problems involving similar shapes where the scale factor is known or can be found- solve problems involving unequal sharing and grouping using knowledge of fractions and multiples. <p>Summer 1 and 2</p>



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Algebra

	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Algebra			- solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = * - 9$.	- recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems	- solve problems, including missing number problems			- use simple formulae generate and describe linear number sequences - express missing number problems algebraically - find pairs of numbers that satisfy an equation with two unknowns - enumerate possibilities of combinations of two variables. Summer 2

In red - stepping stones to algebra in Year 6 (ie missing number problems)

Measurement

	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
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<p>Measurement: Using Measures</p>	<p>Sorting by size Autumn 1 Height and weight Autumn 2 Heavy and light Spring 1 Sorting by size Spring 2 Height and weight Summer 1 Estimating Heavy and light Summer 2</p>	<p>Heights using string etc Spring On the move -Equip compare Summer</p>	<p>- compare, describe and solve practical problems for: -lengths and heights [for example, long/short, longer/shorter, tall/short, double/half] -mass/weight [for example, heavy/light, heavier than, lighter than], -capacity and volume [for example, full/empty, more than, less, than, half, half full, quarter] -time [for example, quicker, slower, earlier, later] - measure and begin to record the following: - lengths and heights - mass/weight - capacity and volume -time (hours, minutes, seconds)</p> <p>Autumn 2, Spring 1, Summer</p>	<p>- choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°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 =</p> <p>Autumn 2, Spring 2</p>	<p>- measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)</p> <p>Autumn 2, Spring, Summer 2</p>	<p>- convert between different units of measure [for example, kilometre to metre; hour to minute] - estimate, compare and calculate different measures</p> <p>Autumn 1, Spring 1, Summer 2</p>	<p>- convert between different units of metric measure (for example, kilometre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) - understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints - use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.</p> <p>Autumn 1, Spring 1, Summer 1</p>	<p>- solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate - use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places - convert between miles and kilometres</p> <p>Spring 2</p>
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Measurement

	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Measurement: Money	Money when shopping Autumn 1	Continuous provision - shop, till etc	<ul style="list-style-type: none"> - recognise and know the value of different denominations of coins and note Autumn 2, Spring 1, Summer	<ul style="list-style-type: none"> - 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 Autumn 2, Spring 2	<ul style="list-style-type: none"> - add and subtract amounts of money to give change, using both £ and p in practical contexts Spring 1, Summer 2	<ul style="list-style-type: none"> - estimate, compare and calculate different measures, including money in pounds and pence Autumn 1, Spring 1, Summer 2	<ul style="list-style-type: none"> - use all four operations to solve problems involving measure [for example, money] using decimal notation Autumn 1, Spring 1, Summer 1	

Measurement



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	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Measurement: Time			<ul style="list-style-type: none"> - sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening] - recognise and use language relating to dates, including days of the week, weeks, months and years - tell the time to the hour and half past the hour and draw the hands on a clock face to show these times <p>Autumn 2, Spring 1, Summer</p>	<ul style="list-style-type: none"> - 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. - compare and sequence intervals of time <p>Autumn 2, Spring 2</p>	<ul style="list-style-type: none"> - tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks - 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 - 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]. <p>Spring 2</p>	<ul style="list-style-type: none"> - read, write and convert time between analogue and digital 12- and 24-hour clocks - solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days. <p>Autumn 1, Spring 1, Summer 2</p>	<ul style="list-style-type: none"> - solve problems involving converting between units of time <p>Spring 1</p>	<ul style="list-style-type: none"> - use, read, write and convert between standard units, converting measurements of time from a smaller unit of measure to a larger unit and visa versa <p>Spring 2</p>

Measurement



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	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Measurement: Perimeter , Area, Volume					<ul style="list-style-type: none"> - measure the perimeter of simple 2-D shapes 	<ul style="list-style-type: none"> - measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres - find the area of rectilinear shapes by counting squares 	<ul style="list-style-type: none"> - measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres - calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm²) and square metres (m²) and estimate the area of irregular shapes - estimate volume [for example, using 1 cm³ blocks to build cuboids (including cubes)] and capacity [for example, using water] 	<ul style="list-style-type: none"> - recognise that shapes with the same areas can have different perimeters and vice versa - recognise when it is possible to use formulae for area and volume of shapes - calculate the area of parallelograms and triangles - calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic metres (m³), and extending to other units [for example, mm³ and km³].
					Autumn 2	Autumn 1, Spring 1, Summer 2	Autumn 2	Spring 2

Measurement Mental skills and knowledge



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Year 1	Year 2	Year 3
<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> Vocabulary of measures (see obj below) Recognise the value of coins Vocabulary of events and time passing and dates (see obj below) Tell the time on the hour and half past Apply adding and subtracting methods to measuring - lots of counting opportunities in measuring context Choose the correct equipment for the measuring task (ruler for length, weighing scales for mass etc) 	<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> Fast recall of the standard units of measure used (m/cm for length, kg/g for mass etc) and choose vessels/measuring devices appropriately Put amounts (lengths, money, capacity, mass etc) on a numberline to order Use \leftrightarrow to compare numbers linked to capacity Add money (coins) up - use commutativity rules (see + -) to apply either number bonds and/or times tables to be more efficient - PAUSE and think Double (and if appropriate halve) the value of coins (work on from + -) Count around a clock face in steps of five - quickly identify/recall (or at worst work out) what the minute (multiple of 5) is at any given point on a clock face Know 60 min = 1 hr, 24hrs = 1 day <p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u></p> <p>Once these have been taught, any of the objectives can be covered again in m+o to remind the children, but these are the obvious m+o objectives</p> <ul style="list-style-type: none"> choose appropriate units of measure and measuring devices compare and order amounts linked to measures - ordering and comparing \leftrightarrow 5 multiples around a clock know the number of minutes in an hour and the number of hours in a day. <p><u>Efficiency/accuracy points to be made</u></p> <ul style="list-style-type: none"> Use this unit as a chance to recover and strengthen m+o from + and - and any other relevant units Support understanding of change and other problems using the visual representation of bar model Use CPA policy for how to work through from practical to visual to abstract mental maths <p><u>Fast recall to be taught by the end of the year</u></p> <p>Know doubles of single digits (and corresponding halves) Know 5 times tables and apply to clock face Know 60 min = 1 hr, 24hrs = 1 day</p>	<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> 25 cm is 5 times bigger than 5cm etc Recall 1000g = 1kg, 1000ml = 1l, 100cm = 1m, 10mm = 1cm Perimeter of rectangles - either doubling the short and the long side and then adding together $(2 \times 2) + (7 \times 2) = 18\text{cm}$ OR add the long and short and then double it $(2 + 7) \times 2 = 18\text{cm}$ Perimeter multiple sided shapes - reorder using number bonds eg $4 + 8 + 2 + 7 + 6$ becomes $4 + 6 + 8 + 2 + 7 = 27\text{cm}$ See addition objectives to support perimeter Number bonds to 100, using empty number lines to add and subtract £ and p Learn I, II, III, IV, V, VI, VII, VIII, IX, X, XI, XII Recognise o'clock, quarter past, half past, 5 multiples Know 60 min = 1 hr, 60sec = 1 min, 7days = 1 week, days in the months of the year, 365 days in a year (and leap year) <p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u></p> <p>Once these have been taught, any of the objectives can be covered again in m+o to remind the children, but these are the obvious m+o objectives</p> <ul style="list-style-type: none"> Compare, add and subtract: lengths (m/cm/mm): mass (kg/g): volume/capacity (l/ml) eg compare 2kg to 600g Perimeter of simple 2-D shapes Add and subtract amounts of money Know the number of seconds in a minute and the number of days in each month, year and leap year <p><u>Efficiency/accuracy points to be made</u></p> <ul style="list-style-type: none"> Reordering multiple numbers to use bonds or stories (for perimeter) Encourage choosing the best method to add, be it doubling, stories, bonds etc - move away from counting on always With learning time, focus on recognising the meaning of the minute hand - fast recognition of the position of the hands Make sure they have opportunity to reorder numbers for perimeter so they practice thinking about how to add and not just count on A lot of known facts, so cover over and over, outside of the maths lesson and outside of this unit - fit in this knowledge in other units too <p><u>Fast recall to be taught by the end of the year</u></p> <p>1000g = 1kg, 1000ml = 1l, 100cm = 1m, 10mm = 1cm I, II, III, IV, V, VI, VII, VIII, IX, X, XI, XII Recognise o'clock, quarter past, half past, 5 multiples Number bonds to 100 Know 60 min = 1 hr, 60sec = 1 min, 7days = 1 week, days in the months of the year, 365 days in a year (and leap year)</p>

Measurement Mental skills and knowledge



Toner Avenue whole school MATHS progression document

Year 4	Year 5	Year 6
<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> • Converting - x and ÷ by 10, 100 and 1000 • Perimeter of rectangles - either doubling the short and the long side and then adding together $(2 \times 2) + (7 \times 2) = 18\text{cm}$ OR add the long and short and then double it $(2 + 7) \times 2 = 18\text{cm}$ • Perimeter multiple sided shapes - reorder using number bonds eg $4 + 8 + 2 + 7 + 6$ becomes $4 + 6 + 8 + 2 + 7 = 27\text{cm}$ • Area - times tables • Money - using decimals in terms of money to add (how many pence to make to the next pound $\pounds 0.76 + \underline{\quad} = \pounds 1$) • Time - 60min = 1 hr, 60sec = 1 min, 12 months = 1 year, 7 days = 1 week. Then so how many minutes in $1 \frac{1}{2}$ hours, how many years is 18 months? etc <p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u> Once these have been taught, they can be covered again in m+o to remind the children</p> <ul style="list-style-type: none"> ▪ Convert between different units of measure ▪ converting from hours to minutes; minutes to seconds; years to months; weeks to days. ▪ money in pounds and pence <p><u>Efficiency/accuracy points to be made</u> Using the place value grid to multiply and divide by 10, 100 and 1000 Multiply by 4 by double and double again Quarter of something/divide by 4 is half and half again Choosing the right method for rectangle perimeter Reordering multiple numbers to use bonds or stories (for perimeter)</p> <p><u>Fast recall to be taught by the end of the year</u> 1000m = 1km, 1000g = 1kg, 1000ml = 1l, 100cm = 1m, 10mm = 1cm (and corresponding halves and quarters) 60min = 1 hr, 60sec = 1 min, 12 months = 1 year, 7 days = 1 week 100p = $\pounds 1$</p>	<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> • Converting - x and ÷ by 10, 100 and 1000 • Perimeter of rectangles - either doubling the short and the long side and then adding together $(2 \times 2) + (7 \times 2) = 18\text{cm}$ OR add the long and short and then double it $(2 + 7) \times 2 = 18\text{cm}$ • Perimeter multiple sided shapes - reorder using number bonds eg $4 + 8 + 2 + 7 + 6$ becomes $4 + 6 + 8 + 2 + 7 = 27\text{cm}$ • Area - times tables • Visually splitting composite shapes • Algebra for missing lengths in rectangles $4 + 2a = 20$ • Calculating cubed numbers (using partitioning jottings to do this mentally) • Time - 60min = 1 hr, 60sec = 1 min, 12 months = 1 year, 7 days = 1 week. Then so how many minutes in $1 \frac{1}{2}$ hours, how many years is 18 months? etc • Money - using decimals in terms of money to add (how many pence to make to the next pound $\pounds 0.76 + \underline{\quad} = \pounds 1$ and over place value barriers) <p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u></p> <ul style="list-style-type: none"> ▪ convert between different units of metric measure ▪ calculate the perimeter ▪ calculate and compare the area of rectangles <p><u>Efficiency/accuracy points to be made</u></p> <ul style="list-style-type: none"> • Using the place value grid to multiply and divide by 10, 100 and 1000 • Multiply by 4 by double and double again and quarter of something/divide by 4 is half and half again • Choosing the right method for rectangle perimeter • Reordering multiple numbers to use bonds or stories (for perimeter) <p><u>Fast recall to be taught by the end of the year</u> 1000m = 1km, 1000g = 1kg, 1000ml = 1l, 100cm = 1m, 10mm = 1cm (and corresponding halves and quarters) 60min = 1 hr, 60sec = 1 min, 12 months = 1 year, 7 days = 1 week 60min = 1 hr, 60sec = 1 min, 12 months = 1 year, 7 days = 1 week</p>	<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> • Revise converting - x and ÷ by 10, 100 and 1000 incl 3d.p. • Revise perimeter of rectangles - either doubling the short and the long side and then adding together $(2 \times 2) + (7 \times 2) = 18\text{cm}$ OR add the long and short and then double it $(2 + 7) \times 2 = 18\text{cm}$ • Revise perimeter multiple sided shapes - reorder using number bonds eg $4 + 8 + 2 + 7 + 6$ becomes $4 + 6 + 8 + 2 + 7 = 27\text{cm}$ • Revise area - times tables - apply to rectangles, triangles and parallelograms • Revise visually splitting composite shapes • Algebra for missing lengths in rectangles $4 + 2a = 20$ • Calculating cubed numbers (using partitioning jottings to do this mentally and reordering for efficiency/ease) and apply to finding volume • Revise time - 60min = 1 hr, 60sec = 1 min, 12 months = 1 year, 7 days = 1 week. Then so how many minutes in $1 \frac{1}{2}$ hours, how many years is 18 months? etc • Revise money - using decimals in terms of money to add (how many pence to make to the next pound $\pounds 0.76 + \underline{\quad} = \pounds 1$ and over place value barriers) • Convert km into miles using 5 miles: 8 km (can look at this represented on a graph) • Measures of temperature incl negative using a numberline visual, moving onto mental <p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u></p> <ul style="list-style-type: none"> ▪ convert between different units of metric measure ▪ calculate the perimeter ▪ calculate and compare the area of rectangles <p><u>Efficiency/accuracy points to be made</u></p> <ul style="list-style-type: none"> • Using the place value grid to multiply and divide by 10, 100 and 1000 • Multiply by 4 by double and double again and quarter of something/divide by 4 is half and half again • Choosing the right method for rectangle perimeter • Reordering multiple numbers to use bonds or stories (for perimeter) <p><u>Fast recall to be taught by the end of the year</u> 1000m = 1km, 1000g = 1kg, 1000ml = 1l, 100cm = 1m, 10mm = 1cm (and corresponding halves and quarters) 60min = 1 hr, 60sec = 1 min, 12 months = 1 year, 7 days = 1 week Know the formulae for a rectangle, triangle and parallelogram Know 5 miles: 8km</p>



Toner Avenue whole school MATHS progression document

Geometry

	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Geometry : Angles and Lines					<ul style="list-style-type: none"> - recognise angles as a property of shape or a description of a turn - identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four 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. <p>Autumn 2, Spring 2, Summer 2</p>	<ul style="list-style-type: none"> - identify acute and obtuse angles and compare and order angles up to two right angles by size - identify lines of symmetry in 2-D shapes presented in different orientations - complete a simple symmetric figure with respect to a specific line of symmetry <p>Autumn 2, Summer 2</p>	<ul style="list-style-type: none"> - know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles - draw given angles, and measure them in degrees (°) - identify: <ul style="list-style-type: none"> -angles at a point and one whole turn (total 360°) -angles at a point on a straight line and $\frac{1}{2}$ a turn (total 180°) -other multiples of 90° <p>Autumn 2, Summer 2</p>	<ul style="list-style-type: none"> - find unknown angles in any triangles, quadrilaterals, and regular polygons - recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles. <p>Spring 1 and 2</p>



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Geometry

	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Geometry : Position and Direction	Positional language Autumn 1 Positional language Spring 2		<ul style="list-style-type: none"> - describe position, direction and movement, including whole, half, quarter and three quarter turns. 	<ul style="list-style-type: none"> - order and arrange combinations of mathematical objects in patterns and sequences - use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anticlockwise) 		<ul style="list-style-type: none"> - describe positions on a 2-D grid as coordinates in the first quadrant - describe movements between positions as translations of a given unit to the left/right and up/down - plot specified points and draw sides to complete a given polygon. 	<ul style="list-style-type: none"> - identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed. 	<ul style="list-style-type: none"> - describe positions on the full coordinate grid (all four quadrants) - draw and translate simple shapes on the coordinate plane, and reflect them in the axes
			Autumn 2, Spring, Summer 1	Autumn 2, Summer 2		Autumn 2, Summer 2	Autumn 2, Summer 2	Spring 1



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Geometry Mental skills and knowledge

Year 1	Year 2	Year 3
<p><u>Fast recall to be taught by the end of the year</u></p> <p>Names of 2D shapes</p> <ul style="list-style-type: none"> - focus on circle, triangle, square, rectangle and expose beyond this when appropriate (pentagon, hexagon, octagon) based on number of sides/angles <p>Names of 3D shapes</p> <ul style="list-style-type: none"> - Sphere, cube, cuboid, pyramids and expose beyond this when appropriate (cone, cylinder) • Describe the above and compare with other shapes • recognise the same shape in different sizes and orientations • Begin to know spellings of shapes 	<p><u>Fast recall to be taught by the end of the year</u></p> <ul style="list-style-type: none"> • Names of 2D shapes - incl circle, triangle, square, rectangle, pentagon, hexagon, heptagon, octagon based on number/size of sides/angles and other facts - regular and irregular • Names of 3D shapes - Sphere, cone, cylinder, cube, cuboid - For all other shapes, tell if it is a prism or a pyramid by referring to 1 base face and point or 2 base faces • Features of the above (number of edges/sides, vertices, faces etc) • Spellings of shapes • (Visually recognise lines of symmetry and investigate using folding) • Know the symbol for a right angle <p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> • Know if a sequence or pattern is followed correctly • Continue sequences or patterns - use above shape knowledge to make patterns - incl the shapes being in different orientations • All children should stand and turn in different ways practically - can they instruct partners how to turn? <p><u>Efficiency/accuracy points to be made</u></p> <ul style="list-style-type: none"> • Know $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ full turns as terms and associate with right angles • Know the symbol for a right angle 	<p><u>Fast recall to be taught by the end of the year</u></p> <p>Names of 2D shapes incl pentagon, hexagon, heptagon, octagon based on number/size of sides/angles and other facts, for regular and irregular</p> <p>Names of 3D shapes incl sphere, tetrahedron and other pyramids, cylinder, cube and cuboid and other prisms</p> <p>Features of the above (number of sides, vertices, faces etc)</p> <p>Visually recognise angles larger and less than 90 degrees</p> <p>Visually recognise horizontal and vertical lines</p> <p>Visually recognise perpendicular and parallel lines</p>



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Geometry Mental skills and knowledge

Year 4	Year 5	Year 6
<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> Bonds to make 90, 180 and 360 - start with 10 multiples $70 + \underline{\quad} = 90$ and them move onto numbers with units eg $34 + = 90$ etc <p><u>Fast recall to be taught by the end of the year</u> 'Along the corridor, up the stairs' Names of shapes incl all quadrilaterals (rhombus, parallelogram, kite, trapezium), pentagon, hexagon, heptagon, octagon, nonagon, decagon based on number/size of sides/angles and other facts, for regular and irregular Names of 3D prisms and pyramids using their 2D base face/s to name them Know Acute $<90^\circ$ Right = 90° Obtuse $>90^\circ$ Visually recognise horizontal and vertical lines, perpendicular and parallel lines Visually recognise angles larger and less than 90 degrees and 180 degrees</p> <p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u></p> <ul style="list-style-type: none"> Counting the sides/angles to decide the name of the shape for pentagon, hexagon, heptagon, octagon, nonagon and decagon <p><u>Fast recall to be taught by the end of the year</u> Names of shapes incl all quadrilaterals (rhombus, parallelogram, kite, trapezium), pentagon, hexagon, heptagon, octagon, nonagon, decagon based on number/size of sides/angles and other facts, for regular and irregular</p>	<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> Bonds to make 90, 180 and 360 - start with 10 multiples $70 + \underline{\quad} = 90$ and them move onto numbers with units eg $34 + = 90$ etc Subtracting from 90, 180, 270 and 360 Subtracting two numbers from the numbers above - $90 - (23 + 47)$ Know triangles and straight line angles equal 180, quadrilaterals and points 360 and right angles are 90 Visually estimate and compare acute, obtuse and reflex angles Recognising and know features of 2D shapes (see below for list), incl if irregular or regular and using these facts to find missing lengths/angles Missing lengths and angles in rectangles <p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u></p> <ul style="list-style-type: none"> Identify 3-D shapes and 2-D shapes Estimate and compare acute, obtuse and reflex angles Use the properties of rectangles to deduce related facts and find missing lengths and angles <p><u>Efficiency/accuracy points to be made</u></p> <ul style="list-style-type: none"> Learn the facts before using <p><u>Fast recall to be taught by the end of the year</u> Names of shapes incl all quadrilaterals (rhombus, parallelogram, kite, trapezium), pentagon, hexagon, heptagon, octagon, nonagon, decagon based on number/size of sides/angles and other facts, for regular and irregular esp which angles/sides are the same Names of 3D prisms and pyramids using their 2D base face/s to name them Number bonds to 10 and 100 Know triangles and lines = 180 degrees, quadrilaterals and points = 360 degrees</p> <p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u></p> <ul style="list-style-type: none"> Counting the sides/angles to decide the name of the shape for pentagon, hexagon, heptagon, octagon, nonagon and decagon <p><u>Fast recall to be taught by the end of the year</u> Names of shapes incl all quadrilaterals (rhombus, parallelogram, kite, trapezium), pentagon, hexagon, heptagon, octagon, nonagon, decagon based on number/size of sides/angles and other facts, for regular and irregular</p>	<p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u></p> <ul style="list-style-type: none"> Counting the sides/angles to decide the name of the shape for pentagon, hexagon, heptagon, octagon, nonagon and decagon Recognise 3D shapes in nets and see if they will work Find missing angles in triangles, quadrilaterals and regular polygons (use algebra to represent the formula) Name the parts of a circle (Circumference, Radius and Diameter) and know diameter is twice the radius (use algebra to represent the formula) recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles. <p><u>Fast recall to be taught by the end of the year</u> Names of shapes incl all quadrilaterals (rhombus, parallelogram, kite, trapezium), pentagon, hexagon, heptagon, octagon, nonagon, decagon based on number/size of sides/angles and other facts, for regular and irregular Names of 3D prisms and pyramids using their 2D base face/s to name them Know triangles and lines = 180 degrees, quadrilaterals and points = 360 degrees Know parts of a circle Know radius is half diameter (diameter half radius)</p> <p><u>Objectives which can be taught as mental and oral and repeated (or taught in one lesson and then repeated as mental and oral)</u></p> <ul style="list-style-type: none"> Counting the sides/angles to decide the name of the shape for pentagon, hexagon, heptagon, octagon, nonagon and decagon and use features to apply to coordinates Scaling within coordinates incl across the negative numbers <p><u>Fast recall to be taught by the end of the year</u> Names of shapes incl all quadrilaterals (rhombus, parallelogram, kite, trapezium), pentagon, hexagon, heptagon, octagon, nonagon, decagon based on number/size of sides/angles and other facts, for regular and irregular Know the rules for 4 quadrant grid</p>



Toner Avenue whole school MATHS progression document

Statistics

	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Statistics : Present and Interpret	Sorting by colour/size Autumn 1 Patterns around us Autumn 2 Continuing patterns Spring 1 Sorting by colour/size Spring 2 Patterns around us Sorting by shape Summer 1 Continuing patterns Summer 2	Heights using string etc Spring		- interpret and construct simple pictograms, tally charts, block diagrams and simple tables Spring 2, Summer 2	- interpret and present data using bar charts, pictograms and tables Autumn 2, Spring 1	- interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. Spring 2	- complete, read and interpret information in tables, including timetables Spring 1, Summer 2	- interpret and construct pie charts and line graphs and use these to solve problems Spring 2
Statistics : Solve Problems				- 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. Spring 2, Summer 2	- 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. Autumn 2, Spring 1	- solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs. Spring 2	- solve comparison, sum and difference problems using information presented in a line graph Spring 1, Summer 2	- calculate and interpret the mean as an average. Spring 2



Toner Avenue whole school MATHS progression document

Statistics Mental skills and knowledge

Year 1	Year 2	Year 3
	<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none">• counting up in 2, 5 and 10 to help scale reading• Read tallies eg III = 3 , II = 2  = 5,  = 10 etc• Number stories and number bonds to add objects in categories or total categorical data - commutativity• Use \leftrightarrow to compare items on graphs 12 rabbits and 15 turtles so $12 < 15$ so Rabbits $<$ Turtles <p><u>Efficiency/accuracy points to be made</u></p> <ul style="list-style-type: none">• Words/questions relating to whether addition or subtraction is required• All addition and subtraction should be completed mentally using methods from addition/subtraction unit• where possible, data reading should be done using multiples of 2, 5 and 10 to build upon previous learning	<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none">• counting up in 2, 4, 5, 10 to help scale reading• Halfway between numbers (multiples of 2, 4, 5, 10) to help reading scales <p><u>Efficiency/accuracy points to be made</u></p> <ul style="list-style-type: none">• Words/questions relating to whether addition or subtraction is required• All addition and subtraction should be completed mentally using methods from addition/subtraction unit



Toner Avenue whole school MATHS progression document

Statistics Mental skills and knowledge

Year 4	Year 5	Year 6
<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> • Adding data from a graph - reorder using number bonds eg $4 + 8 + 2 + 7 + 6$ becomes $4 + 6 + 8 + 2 + 7 = 27$ cats altogether • Number stories to add single digit numbers - eg $5 + 7 = (5 + 5 + 2 = 12)$ or $(2 + 3 + 7 = 12)$ - build up with jottings until it is mentally drawn upon • Adding two digit number to a two digit number by using partitioning - $34 + 53 = 30 + 50 + 4 + 3 = 87$ • Using doubles knowledge to add or subtract $8 + 8 = 12 - 6 =$ • Subtracting from a two digit number - can it be partitioned? $45 - 12 =$ yes $56 - 27 =$ no use an empty number line - this must be drawn with jottings so eventually it becomes a visual they draw upon mentally - discuss their own number line • Halfway and quarter way points between numbers (incl estimating on a line) <p><u>Efficiency/accuracy points to be made</u></p> <ul style="list-style-type: none"> • Most of this should be done mentally so keep expectations high that they use efficient mental methods (sometimes with jottings/visuals) - apply! • Words/questions relating to whether addition or subtraction is required <p><u>Fast recall to be taught by the end of the year</u> Doubles to add and subtract Bonds to 10, 100 and 1 Number stories (drawing on bonds to 10) Halving and quartering numbers (see division for appropriate amounts)</p>	<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> • Adding data from a graph - reorder using number bonds eg $4 + 8 + 2 + 7 + 6$ becomes $4 + 6 + 8 + 2 + 7 = 27$ cats altogether • Number stories to add single digit numbers - eg $5 + 7 = (5 + 5 + 2 = 12)$ or $(2 + 3 + 7 = 12)$ - build up with jottings until it is mentally drawn upon • Adding two digit number to a two digit number by using partitioning - $34 + 53 = 30 + 50 + 4 + 3 = 87$ • Using doubles knowledge to add or subtract $8 + 8 = 12 - 6 =$ • Subtracting from a two digit number - can it be partitioned? $45 - 12 =$ yes $56 - 27 =$ no use an empty number line - this must be drawn with jottings so eventually it becomes a visual they draw upon mentally - discuss their own number line • Halfway and quarter way points between numbers (incl estimating on a line) • Time - $60\text{min} = 1 \text{ hr}$, $60\text{sec} = 1 \text{ min}$ <p><u>Efficiency/accuracy points to be made</u></p> <ul style="list-style-type: none"> • Most of this should be done mentally so keep expectations high that they use efficient mental methods (sometimes with jottings/visuals) - apply! • Words/questions relating to whether addition or subtraction is required <p><u>Fast recall to be taught by the end of the year</u> Doubles to add and subtract Bonds to 10, 100 and 1 Number stories (drawing on bonds to 10) Halving and quartering numbers (see division for appropriate amounts) Time - $60\text{min} = 1 \text{ hr}$, $60\text{sec} = 1 \text{ min}$</p>	<p><u>Starting points - Mental and oral areas to support the objectives</u></p> <ul style="list-style-type: none"> • Recall adding data from a graph - reorder using number bonds eg $4 + 8 + 2 + 7 + 6$ becomes $4 + 6 + 8 + 2 + 7 = 27$ cats altogether • Recall number stories to add single digit numbers - eg $5 + 7 = (5 + 5 + 2 = 12)$ or $(2 + 3 + 7 = 12)$ - build up with jottings until it is mentally drawn upon • Recall adding two digit number to a two digit number by using partitioning - $34 + 53 = 30 + 50 + 4 + 3 = 87$ • Recall using doubles knowledge to add or subtract $8 + 8 = 12 - 6 =$ • Recall subtracting from a two digit number - can it be partitioned? $45 - 12 =$ yes $56 - 27 =$ no use an empty number line - this must be drawn with jottings so eventually it becomes a visual they draw upon mentally - discuss their own number line • Recall halfway and quarter way points between numbers (incl estimating on a line) • Recall time - $60\text{min} = 1 \text{ hr}$, $60\text{sec} = 1 \text{ min}$ • Estimate fractions/percentages shaded on a circle to the apply to estimating amounts on a pie chart • Know that a circle is 360 degrees, so know the degree when the circle is cut into different parts (if 10 equal sections, each is 36 degrees) • Finding the mean - use adding mental skills (number bonds, reordering) and division knowledge • Convert km into miles using 5 miles: 8 km (can look at this represented on a graph) <p><u>Efficiency/accuracy points to be made</u></p> <ul style="list-style-type: none"> • Most of this should be done mentally so keep expectations high that they use efficient mental methods (sometimes with jottings/visuals) - apply! • Words/questions relating to whether addition or subtraction is required <p><u>Fast recall to be taught by the end of the year</u> Doubles to add and subtract Bonds to 10, 100 and 1 Number stories (drawing on bonds to 10) Halving and quartering numbers (see division for appropriate amounts) Time - $60\text{min} = 1 \text{ hr}$, $60\text{sec} = 1 \text{ min}$</p>