Calculation Policy

Summary
This calculation policy has been devised from using White Rose Maths and AET Maths to develop consistency for understanding and progression for fluency of the 2014 curriculum and calculation concepts through a child's mathematical development.

Principles

- This calculation policy is focused on developing proficiency with the expected formal written methods by the end of Year 6 and hence the progression guidance provided for each operation is designed to flow into the expected method as exemplified on the National Curriculum Appendix document.
- Specific practical equipment and approaches have been suggested for each age group to support children in developing the conceptual understanding that will enable them to move more rapidly and efficiently towards the formal written methods expected.
- It is recommended that teachers encourage children to simultaneously carry out the calculation practically using the equipment/representation suggested and to record this calculation step by step using the parallel formal written method.
- It is expected that academies will work towards the fluency goals for each age group but that, where necessary, teachers will use approaches and materials from earlier year groups to bridge any gaps in a child's understanding.
- Teachers should have an understanding of the expectations and progression for all year groups, regardless of which year group they teach.
- The 'Written Methods', 'With jottings …or in your head' and 'Just know it' sections list the national curriculum expectations of the year group for calculation.
- The 'Developing Conceptual Understanding' section illustrates how to build children's understanding of the formal methods using a range of specific practical equipment and representations. The expected language for the formal methods is modelled in this section in the older year groups – this language should be used throughout whenever the formal method is used.
- The 'Foundations' section for each year group highlights the skills and knowledge that should be addressed on a regular basis within this year group to ensure that children have the requisite fluency to address the new approaches required.

FOUNDATION

Addition

Written:
Read (and write) numbers to 10
Recognise and understand the meaning of +/-/=
Add 2 single digit numbers – using a variety of manipulatives.

Developing conceptual understanding:
1 more 1 less (count on and back)
Using quantities and objects add/subtract two one digit numbers.
Comparing quantities up to 10 in different contexts (greater than, less than or the same)
Numberline/cubes/objects/counters/Numicon/tens frames/fingers
Number bonds
Teen numbers – seeing what a teen number is e.g. one ten and 4 ones

With jotting…or in your head:
Children count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number.
Using quantities and objects add/subtract two one digit numbers.
They solve problems, including doubling, halving and sharing.

Just know it!
Children count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number.
Number bonds to 5 (some to 10)
Subitising to 5

Foundations:
Recognising/counting/ordering numbers to 10 then 20
1 more - Counting forward from a given number
Develop wide range of manipulatives
Number bonds to ten
They solve problems, including doubling, halving and sharing.

Subtraction

Written:
Read (and write) numbers to 20.
Recognise and understand the meaning of +/-/=
Subtract 2 single digit numbers – using a variety of manipulatives.

Developing conceptual understanding:
1 more 1 less (count on and back)
Using quantities and objects add/subtract two one-digit numbers.
Comparing quantities up to 10 in different contexts (greater than, less than or the same)
Numberline/cubes/objects/counters/Numicon/tens frames/fingers
Number bonds
Teen numbers – seeing what a teen number is e.g. one ten and 4 ones

With jotting…or in your head:
Children count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number.
Using quantities and objects subtract two one digit numbers.
They solve problems, including doubling, halving and sharing.

Just know it!
Children count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number.
Some subtractions facts

Foundations:
Recognising/counting/ordering numbers to 10 (then 20)
1 less- Counting back from a given number
Develop wide range of manipulatives
Number bonds to ten
They solve problems, including doubling, halving and sharing.

Multiplication

Written:
Developing conceptual understanding:
Grouping objects: two frogs on this lily pad two frogs on this lily pad
Objects/Numicon/tens frames
Doubling/halving numbers to 10 – numicon, tens frames, cubes

With jotting…or in your head:
Using quantities and objects
Calculating the answer using concrete objects, pictorial representations

Just know it!
Children count reliably with numbers from one to 20.
Exceeding children: begin to count in twos
Recall some doubling facts

Foundations:
Recognising/counting/ordering numbers to 10 then 20
1 more
Counting forward from a given number
Develop wide range of manipulatives
Number bonds to ten
Grouping objects
They solve problems, including doubling, halving and sharing.

Division

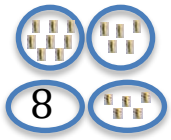
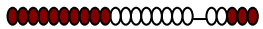
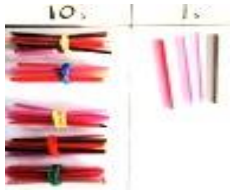
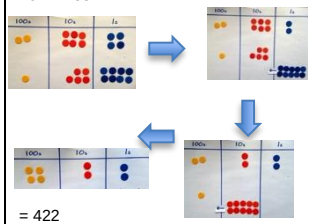
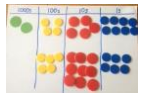
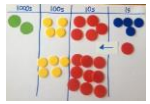
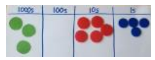
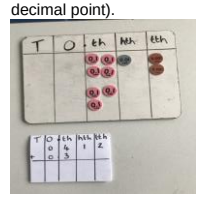
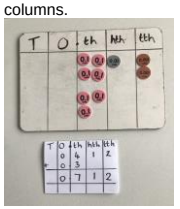
Written:
Developing conceptual understanding:
Halving groups of objects between two.
Sharing groups of objects between more than two
Pictorial representations e.g. ladybird halving her spots/sharing her spots

With jotting…or in your head:
Using quantities and objects
Use of a variety of manipulatives
Calculating the answer using concrete objects, pictorial representations
Referring to double facts for support/reference to halving

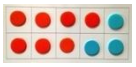
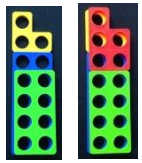
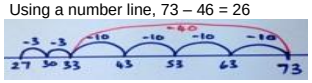
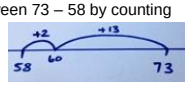
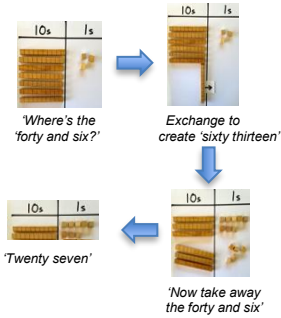
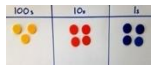
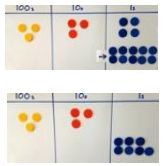
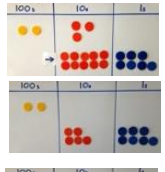
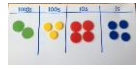
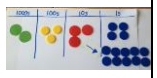
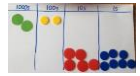
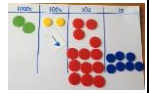
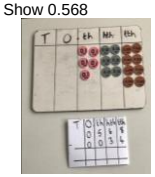
Just know it!
Children count reliably with numbers from one to 20.
Halving is between two
Sharing is between more than two
Exceeding children: begin to count in twos

Foundations:
Recognising/counting/ordering numbers to 10 then 20
1 more/1 less
Counting forward/backward from a given number
Develop wide range of manipulatives
Recall doubling facts
Number bonds to ten
Grouping objects
They solve problems, including doubling, halving and sharing.

Addition

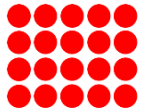
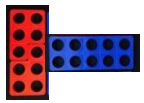
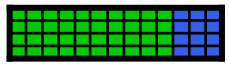
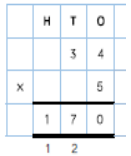
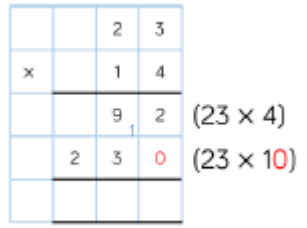
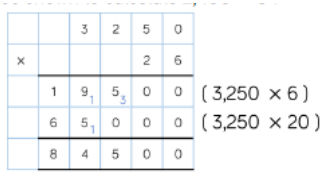
	1	2	3	4	5	6
Written Methods	Read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs	Add and subtract two two-digit numbers using concrete objects, pictorial representations progressing to formal written methods 46 +27 73 1	Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction 423 + 88 511 1 1	Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition where appropriate 2458 + 596 3054 1 1 1	Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) 23454 + 596 24050 1 1 1	Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
Developing conceptual understanding	Making the numbers up to 10 in different ways e.g.5 = 4 + 1 5 = 2 + 3 Making number bonds within 10 e.g. 6+4, 3 + 7 etc  Number bonds Numicon (Ten frame)  Use bonds of 10 to calculate bonds of 20 Count on Count all  Count on, on number track, in 1s  See additional notes for part/whole and bar models.	Number track / Number line/bead strings – jumps of 1 then efficient jumps using number bonds 18 + 5 = 23  Use dienes to link the concrete and abstract. 24 +10 +10 +10 = 54  Arrow cards  See additional notes for part/whole and bar models.	Continue to use the dienes and when confident use the place value counters. Place value counters, 100s, 10s, 1s 264 + 158  = 422 See additional notes for part/whole and bar models.	Place Value Counters 2458 + 596 Show 2458 and 596  Combine the 1s. Exchange ten 1s for a 10 counter.  Combine the 10s. Exchange ten 10s for a 100 counter.  Combine the 100s. Exchange ten 100s for a 1000 counter  Read final answer Three thousand and fifty-four.  Children will need to build up to several exchanges. See additional notes for part/whole and bar models.	**For both Years 5 and 6 and including decimals up to 3 places:** Set out the calculation In columns. 23454 + 596 Find the sum of the ones. 4 ones + 6 ones = 10 ones (or 1 ten and 0 ones) so record 0 in the ones and 1 below the line in the tens. 23454 + 596 0 1 Find the sum of the tens. 5 tens + 9 tens + 1 ten = 15 tens (or 1 hundred and 5 tens) so record a 5 in the tens and 1 below the line in the hundreds. 23454 + 596 50 1 1 Find the sum of the hundreds. 4 hundreds + 5 hundreds + 1 hundred = 10 hundreds (or 1 thousand and 0 hundreds) so record a 0 in the hundreds and a 1 in the thousands. 23454 + 596 050 1 1 1 Find the sum of the thousands. 3 thousands + 1 thousand = 4 thousands so record a 4 in the thousands column. 23454 + 596 4050 1 1 1 Find the sum of the ten thousands. There are only 2 ten thousands so record a 2 in the final column. 23454 + 596 24050 1 1 1 See additional notes for part/whole and bar models.	Place value counters 0.412 + 0.3 Show 0.412  Add 0.3 (I know the 3 has a value of 3 tenths because the 3 is in the column to the right of the decimal point).  Find the answer by adding all of the counters in each of the columns.  Read the final answer of 0.712
With jottings … or in your head	Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ☐ – 9	Add and subtract numbers using concrete objects, pictorial representations & mentally including: * a two-digit number and ones * a two-digit number and tens * two two-digit numbers * adding three one-digit numbers	Add and subtract numbers mentally, including: * a three-digit number and ones * a three-digit number and tens * a three-digit number and hundreds	Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	Add and subtract numbers mentally with increasingly large numbers	Perform mental calculations, including with mixed operations and large numbers
Just know it!	Represent & use number bonds and related subtraction facts within 20 Add and subtract one-digit and two-digit numbers to 20, including zero	Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100				
Year	**1**	**2**	**3**	**4**	**5**	**6**
Foundations	1 more	10 more Number bonds: 20, 12, 13	Add multiples of 10, 100	Add multiples of 10s , 100s, 1000s	Add multiples of 10s , 100s, 1000s, tenths,	Add multiples of 10s , 100s, 1000s, tenths, hundredths
	Number bonds: 5, 6	Number bonds: 14,15 Add 1 digit to 2 digit by bridging.	Add single digit bridging through boundaries	Fluency of 2 digit + 2 digit	Fluency of 2 digit + 2 digit including with decimals	Fluency of 2 digit + 2 digit including with decimals
	Largest number first. Number bonds: 7, 8	Partition second number, add tens then ones	Partition second number to add Pairs of 100	Partition second number to add Decimal pairs of 10 and 1	Partition second number to add	Partition second number to add
	Add 10. Number bonds: 9, 10	Add 10 and multiples. Number bonds: 16 and 17	Use near doubles to add	Use near doubles to add	Use number facts, bridging and place value	Use number facts, bridging and place value
	Ten plus ones. Doubles up to 10	Doubles up to 20 and multiples of 5 Add near multiples of 10.	Add near multiples of 10 and 100 by rounding and adjusting	Adjust both numbers before adding Add near multiples	Adjust numbers to add	Adjust numbers to add
	Use number bonds of 10 to derive bonds of 11	Number bonds: 18, 19 Partition and recombine	Partition and recombine	Partition and recombine	Partition and recombine	Partition and recombine

Subtraction

Written Methods	Read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs	*Add and subtract two two-digit numbers using concrete objects, pictorial representations progressing to formal written methods* 6 1 7 3 - 4 6 2 7	Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction 2 3 1 2 3 4 - 1 8 7 1 5 7	Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition where appropriate 1 2 3 1 2 3 4 4 - 1 8 7 2 1 5 7	Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)	Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
Developing conceptual understanding	Number bonds  (Ten frame)  Difference between 7 and 10 6 less than 10 is 4  Count out, then count how many are left. 7 – 4 = 3  Count back on a number track, then number line. 15 – 6 = 9  Difference between 13 and 8 13 – 8 = _ 8 + _ = 13  See additional notes for part/whole and bar models.	Number track / Number line – jumps of 1 then efficient jumps using number bonds 23 – 5 = 18 = 23 – 3 – 2 = 18 Using a number line, 73 – 46 = 26  Difference between 73 – 58 by counting up, 58 + _ = 73  Taking away and exchanging, 73 – 46  'Where's the 'forty and six?' Exchange to create 'sixty thirteen' 'Twenty seven' 'Now take away the forty and six' See additional notes for part/whole and bar models.	Continue to use the dienes and when confident use the place value counters. Place value counters *'Where's the one hundred and eighty and seven?*  *Exchange to create three hundred and thirty and fourteen. Now take away the 'seven'*  *Exchange to create two hundred, thirteen tens and seven Now take away the 'eighty'*  *Now take away the 'one hundred'*  See additional notes for part/whole and bar models.	Taking away and exchanging, 2344 – 187 Place value counters *Where's the one hundred and eighty- seven?*  *Exchange a 10 for ten 1s to create two thousand, three hundred and thirty and fourteen.*  *Now take away 'seven'.*  *Exchange a 100 for ten 10s to create two thousand, two hundred, thirteen tens and seven.*  *Now take away 'eighty'*  *Now take away 'one hundred'*  *There are no thousands to take away.*  See additional notes for part/whole and bar models.	**For both Years 5 and 6 and including decimals up to 3 places:** *Set out the calculation in columns* 5 2 3 4 4 - 1 1 8 7 *The 1s column: four subtract seven Because seven is greater than four, exchange a 10 for ten 1s. So there are now three 10s and fourteen 1s.* *Fourteen 1s subtract seven 1s makes seven 1s – record this.* *The 10s column: three subtract eight. Because eight is greater than three, exchange a 100 for ten 10s. So there are now two 100s and thirteen 10s.* *Thirteen 10s subtract eight 10s makes five 10s – record this.* *The 100s column: two subtract one. Two 100s subtract one 100 makes one 100 – record this.* *The 1000s column: two subtract one. Two 1000s subtract one 1000 makes one 1000 – record this.* *The 10,000s column: there are only five 10000s with nothing to subtract. So record 5.* 5 1 1 5 7 See additional notes for part/whole and bar models.	Place value counters 0.568 – 0.034 Show 0.568  Subtract the 0.004 (I know the 4 has the value of 4 thousandths because it is in the thousandths column).  Subtract 0.03 (I know the 3 is 3 hundredths because the 3 is in the hundredths column).  Find the answer by totalling all of the counters in each of the columns. Read the final answer 0.534
With jottings **… or in your head**	Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ☐ – 9	Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: * a two-digit number and ones * a two-digit number and tens * two two-digit numbers * adding three one-digit numbers	Add and subtract numbers mentally, including: * a three-digit number and ones * a three-digit number and tens * a three-digit number and hundreds	Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	Add and subtract numbers mentally with increasingly large numbers	Perform mental calculations, including with mixed operations and large numbers
Just know it!	Represent and use number bonds and related subtraction facts within 20 Add and subtract one-digit and two-digit numbers to 20, including zero	Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100				

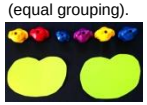
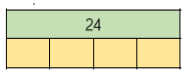
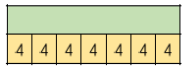
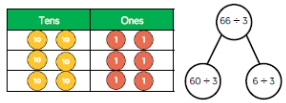
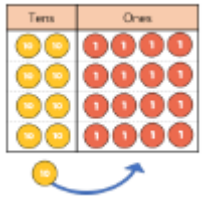
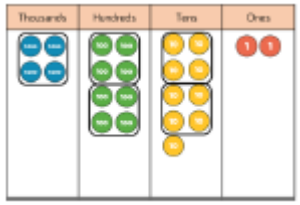
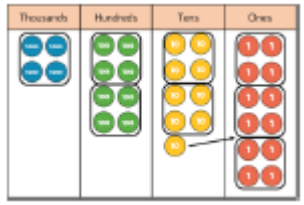
Year	1	2	3	4	5	6
Foundations	1 less	10 less Number bonds, subtraction: 20, 12, 13	Subtract multiples of 10 and 100	Subtract multiples of 10s , 100s, 1000s	Subtract multiples of 10s , 100s, 1000s, tenths,	Subtract multiples of 10s , 100s, 1000s, tenths, hundredths
	Number bonds, subtraction: 5, 6	Number bonds, subtraction: 14, 15 Subtract 1 digit from 2 digit by bridging	Subtract single digit by bridging through boundaries	Fluency of 2 digit subtract 2 digit	Fluency of 2 digit - 2 digit including with decimals	Fluency of 2 digit - 2 digit including with decimals
	Count back Number bonds, subtraction: 7, 8	Partition second number, count back in 10s then 1s	Partition second number to subtract	Partition second number to subtract Decimal subtraction from 10 or 1	Partition second number to subtract	Partition second number to subtract
	Subtract 10. Number bonds, subtraction: 9, 10	Subtract 10 and multiples of 10 Number bonds, subtraction: 16, 17	Difference between	Difference between	Difference between	Use number facts bridging and place value
	Teens subtract 10.	Subtract near multiples of 10	Subtract near multiples of 10 and 100 by rounding and adjusting	Subtract near multiples by rounding and adjusting	Adjust numbers to subtract	Adjust numbers to subtract
	Difference between	Difference between Number bonds, subtraction: 18, 19	Difference between	Difference between	Difference between	Difference between

Multiplication

Written Methods		Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs	Write and calculate mathematical statements for ÷ using the x tables they know progressing to formal written methods. 1 3 X 4 5 2 1	Multiply two-digit and three-digit numbers by a one-digit number using formal written layout 243 x 6 2058 1	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 243 x 36 1458 7290 8748 1	Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication 5172 x 38 41376 155160 196536 1 See additional notes for bar model.
Developing conceptual understanding	Frogs on each lily pad. Discuss idea of equal/unequal grouping.     Developing to arrays. 4 x 5 = 20 5 x 4 = 20 	5 frogs on each lily pad 3 x 5 = 15   Arrays 5 x 2 = 2 x 5  Link to repeated addition. 2 + 2 + 2 + 2 + 2 = 10 5 + 5 = 10	Arrays 3 x 6 = 6 x 3  13 x 4 = 10 x 4 + 3 x 4   40 12 Dienes 21 x 3  Place Value Counters 34 x 2  See additional notes for bar model.	Place value counters 34 x 5   245 x 4  See additional notes for bar model.	SEE ADDITIONAL NOTES TO SHOW HOW TO MULTIPLY BY A 2 DIGIT NUMBER. LEADING TO  (23 × 4) (23 × 10)  (3,250 × 6) (3,250 × 20) See additional notes for bar model.	See additional notes for bar model.
With jottings **… or in your head ….**	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	Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts	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 methods	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	Multiply and divide numbers mentally drawing upon known facts Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers establish whether a number up to 100 is prime	Perform mental calculations, including with mixed operations and large numbers
Just know it!	Count in multiples of twos, fives and tens	Recall and use x and ÷ facts for the 2, 5 and 10 x tables, including recognising odd and even numbers.	Recall and use x and ÷ facts for the 3, 4 and 8 times tables.	Recall x and ÷ facts for x tables up to 12 x 12.	Recall prime numbers up to 19 know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers Recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3})	

Year	1	2	3	4	5	6
Foundations	Count in 2s	2 x table	Review 2x, 5x and 10x	4x, 8x tables 10 times bigger	4x, 8x tables 100, 1000 times bigger	Multiplication facts up to 12 x 12
	Count in 10s	10 x table	4x table	3x, 6x and 12x tables	3x, 6x and 12x tables 10, 100, 1000 times smaller	Partition to multiply mentally
	Doubles up to 10	Doubles up to 20 and multiples of 5	Double two digit numbers	Double larger numbers and decimals	Double larger numbers and decimals	Double larger numbers and decimals
	Count in 5s	5 x table	8 x table	3x, 9x tables	3x, 9x tables	Multiplication facts up to 12 x 12
	Double multiples of 10	Count in 3s	3 x table	11x, 7 x tables	11x , 7 x tables Partition to multiply mentally	Partition to multiply mentally
	Count in 2s, 5s and 10s	2 x, 5 x and 10 x tables	6 x table or review others	6x, 12 x tables	6x, 12 x tables	Double larger numbers and decimals

Division

Written Methods		Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs	Write and calculate mathematical statements for ÷ using the x tables they know progressing to formal written methods (2 digit divided by 1 digit and no remainders). $3\overline{)4\ 15}$ → 1 5	Pupils practice to become fluent in the formal written method of short division (H,T and Os divided by Os) 362 ÷ 7 = 5 1 r5	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 $4\overline{)4\ 8\ 9\ 12}$ → 1 2 2 3	Divide numbers up to 4-digits by a two-digit whole number using the formal written method of short division where appropriate for the context $23\overline{)4\ 49\ 34\ 115}$ → 0 2 1 5
Developing conceptual understanding	6 ÷2 = 3 by sharing into 2 groups and by grouping in 2s (equal grouping).   	15 ÷3 = 5 in each group (sharing)   Link to fractions 15 ÷ 3 = 5 groups of 3 (grouping)  See additional notes for bar model.	Circle the counters in groups of 3 and complete the division.  ___ ÷ 3 = ___ Circle the counters in 3 equal groups and complete the division.  ___ ÷ 3 = ___  24 ÷ 4 = ___  ___ ÷ 4 = ___  66 ÷ 3 → 60 ÷ 3, 6 ÷ 3 Link place value counters to formal written method. See additional notes for part whole/bar models.	96 ÷4 =  Use of place value counters leading to formal written method (bus stop). DO NOT USE PART WHOLE MODEL LIKE WHITE ROSE. See additional notes for bar models.	4892 ÷4 =  Below shows exchanging 1 ten for 10 ones.  Linked to formal written method. See additional notes for bar model.	434 ÷ 31 = ? × 31: 1 31; 2 62; 3 ; 4 124; 5 155; 6 ; 7 ; 8 248; 9 ; 10 310 $31\overline{)4\ 3\ 4}$ → 0 4 hundreds ÷ 31 = 0 hundreds r 4 hundreds • *'Write "0" in the hundreds column…'* $31\overline{)4\ 43\ 4}$ → 0 4 hundreds = 40 tens • *'…and write "4" to the left of the tens digit of the dividend.'* $31\overline{)4\ 43\ 4}$ → 0 1 43 tens ÷ 31 = 1 ten r 12 tens • *'Write "1" in the tens column…'* $31\overline{)4\ 43\ 124}$ → 0 1 12 tens = 120 ones • *'…and write "12" to the left of the ones digit of the dividend.'* $31\overline{)4\ 43\ 124}$ → 0 1 4 124 ones ÷ 31 = 4 ones (refer to the ratio chart) • *'Write "4" in the ones column.'* See additional notes for bar model.
With jottings **… or in your head ….**	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	Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts	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 methods	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	Multiply and divide numbers mentally drawing upon known facts Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	Perform mental calculations, including with mixed operations and large numbers
Just know it!	Count in multiples of twos, fives and tens	Recall and use x and ÷ facts for the 2, 5 and 10 x tables, including recognising odd and even numbers.	Recall and use x and ÷ facts for the 3, 4 and 8 times tables	Recall x and ÷ facts for x tables up to 12 x 12.	Recall prime numbers up to 19 know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers	
Year	**1**	**2**	**3**	**4**	**5**	**6**
Foundations	Count back in 2s	Division facts (2 x table)	Review division facts (2x, 5x, 10x table)	Division facts (4x, 8x tables) 10 times smaller	Division facts (4x, 8x tables) 100, 1000 times smaller	Division facts (up to 12 x 12)
	Count back in 10s	Division facts (10 x table)	Division facts (4 x table)	Division facts (3x, 6 x, 12x tables)	Division facts (3x, 6 x, 12x tables) Partition to divide mentally	Partition to divide mentally
	Halves up to 10	Halves up to 20	Halve two digit numbers	Halve larger numbers and decimals	Halve larger numbers and decimals	Halve larger numbers and decimals
	Count back in 5s	Division facts (5 x table)	Division facts (8 x table)	Division facts (3x, 9x tables)	Division facts (3x, 9x tables) 100, 1000 times smaller	Division facts (up to 12 x 12)
	Halve multiples of 10	Count back in 3s	Division facts (3 x table)	Division facts (11x, 7x tables)	Review division facts (11x, 7x tables) Partition decimals to divide mentally	Partition to divide mentally
	How many 2s? 5s? 10s?	Review division facts (2x, 5x, 10x table)	Division facts (6 x table) or review others	Division facts (6x, 12x tables)	Review division facts (6x, 12x tables) Halve larger numbers and decimals	Halve larger numbers and decimals

Glossary of Terms

2-digit number– a number with 2 digits like 23, 45, 12 or 60

3-digit number – a number with 3 digits like 123, 542, 903 or 561

Addition facts – knowing that 1+1 = 2 and 1+3 = 4 and 2+5 = 7. Normally we only talk about number facts with totals of 20 and under.

Array - An array is an arrangement of a set of numbers or objects in rows and columns –it is mostly used to show how you can group objects for repeated addition or subtraction.

Bead String/Bar – a string with (usually 100) beads on, grouped by colour in tens. The bead string is a good bridge between a number track and a number line as it maintains the cardinality of the numbers whilst beginning to develop the concepts of counting 'spaces' rather than objects.

Bridging – when a calculation causes you to cross a 'ten boundary' or a 'hundred boundary' e.g. 85 + 18 will bridge 100.

Compact vertical – the name of the recommended written method for addition whereby the numbers are added in columns, 1s first then 10s and so on. Where the total exceeds 10, the ten 1s are exchanged for a 10 and written below the answer line. Sometimes referred to as 'carrying'.

Concrete apparatus – objects to help children count and calculate– these are most often cubes (multilink) but can be anything they can hold and move including Cuisenaire rods, Dienes rods (hundreds, tens and units blocks), straws, Numicon, Place Value counters and much more.

Count all – when you add by counting all the items/objects e.g. to add 11 and 5 you would count out 11, then count out 5, then put them together and count them all to get **16**.

Count on – when you add (or sometimes subtract) by counting onwards from a given number. E.g. to add 11 and 5 you would count on 5 from 11 i.e. 12, 13, 14, 15, **16**

Decimal number – a number with a decimal point e.g. 2.34 (said as two point three four)

Decomposition – the name of the recommended written method for subtraction whereby the smaller number is subtracted from the larger, 1s first then 10s and so on. Where the subtraction cannot be completed as the second number is larger than the first, a 10 is exchanged for ten 1s to facilitate this. This is the traditional 'borrowing' form of column method, which is different to the 'payback' method.

Dienes Rods (or Base 10) – this is a set of practical equipment that represents the numbers to help children with place value and calculation. The Dienes rods show 1s, 10s, 100s and 1000s as blocks of cubes that children can then combine. Dienes rods do not break up so the child has to 'exchange' them for smaller or larger blocks where necessary.

Difference – the gap between numbers that is found by subtraction e.g. 7-5 can be read as '7 take away 5' or as the 'difference between 7 and 5'

Dividend – the number being divided in a calculation

Divisor – the smaller number in a division calculation.

Double – multiply a number by 2

Efficient Methods – the method(s) that will solve the calculation most rapidly and easily

Equals - is worth the same as (be careful not to emphasise the use of = to show the answer)

Exchanging – Swapping a '10' for ten '1s' or a '100' for ten '10s' or vice versa (used in addition and subtraction when 'moving' 'ten' or a 'hundred' from its column into the next column and splitting it up). Heavily relied upon for addition and subtraction of larger numbers. Skills in this can be built up practically with objects, then Dienes rods/base 10, then place value counters before relying on a solely written method.

Expanded Multiplication – a method for multiplication where each stage is written down and then added up at the end in a column

Factor – a number that divides exactly into another number, without remainder

Grid method – a method for multiplying two numbers together involving partitioning and multiplying each piece separately.

Grouping – an approach to division where the dividend is split into groups of the size of the divisor and the number of groups created are then counted.

Half - a number, shape or quantity divided into 2 equal parts

Halve – divide a number by 2

Integer - a whole number (i.e. one with no decimal point)

Inverse – the opposite operation. For example, addition is the inverse of subtraction and multiplication is the inverse of division.

Known Multiplication Facts – times tables and other number facts that can be recalled quickly to support with larger or related calculations e.g. if you know 4x7 then you also know 40 x 70, 4 x 0.7 etc.

Long Division – formal written of division where the remainders are calculated in writing each time (extended version of short division)

Long Multiplication – formal written method of column multiplication

Multiple - a number which is an exact product of another number i.e. a number which is in the times table of another number

Number bonds – 2 numbers that add together to make a given total, e.g. 8 and 2 bond to 10 or 73 and 27 bond to 100

Number line – a line either with numbers or without (a blank numberline).
The number line emphasises the continuous nature of numbers and the existence of 'in-between' numbers that are not whole. It is based around the gaps between numbers.
Children use this tool to help them count on or count back for addition of subtraction. As they get older, children will count in 'jumps' on a number line e.g. to add 142 to a number they may 'jump' 100 and then 40 and then 2. The number line is sometimes used in multiplication and division but can be time consuming.

Number track – a sequence of numbers, each inside its own square. It is a simplified version of the number line that emphasises the whole numbers.

Numicon – practical maths equipment that teaches children the names and values of numbers 1-10 initially but them helps them with early addition, subtraction, multiplication and division. Numicon is useful for showing the real value of a number practically.

One-Step Calculation – a calculation involving only one operation e.g. addition. Usually the child must decide what that operation is.

Partition – split up a larger number into parts, such as the hundreds, tens and units e.g. 342 can be partitioned into 300 and 40 and 2

Place Value – the value of a digit created by its position in a number e.g. 3 represents thirty in 234 but three thousand in 3567

Recombine – for addition, once you have partitioned numbers into hundreds, tens and units then you have to add then hundreds together, then add the tens to that total, then add the units to that total

Remainder – a whole number left over after a division calculation

Repeated addition – repeatedly adding groups of the same size for multiplication

Scaling – an approach to multiplication whereby the number is 'scaled up' by a factor of the multiplier e.g. 4 x 3 means 4 scaled up by a factor of 3.

Sharing – an approach to division whereby the dividend is shared out into a given number of groups (like dealing cards)

Short Division - traditional method for division with a single digit divisor (this is a compact version of long division, sometimes called 'bus stop')

Significant digit – the digit in a number with the largest value e.g. in 34 the most significant digit is the 3, as it has a value of '30' and the '4' only has a value of '4'

Single digit – a number with only one digit. These are always less than 10.

Sum – the total of two or more numbers (it implies addition). Sum should not be used as a synonym for calculation.

Two-step calculation - a calculation where two different operations must be applied e.g. to find change in a shop you will usually have to add the individual prices and then subtract from the total amount. Usually the child has to decide what these two operations are and the order in which they should be applied.