Our Lady Catholic Primary School
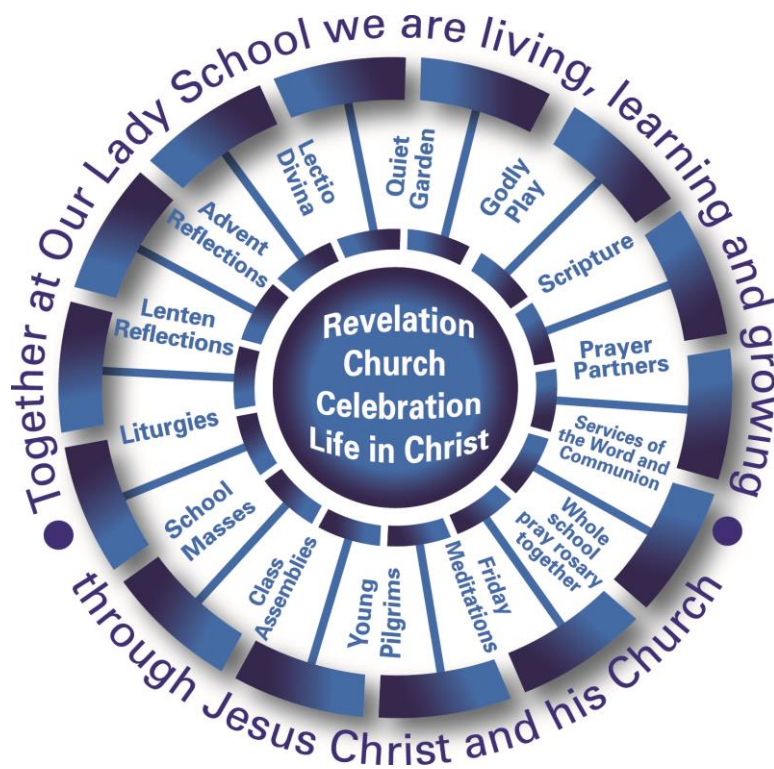
Calculation Policy

A guide for teachers and parents 2019/2020

The Diocese of Westminster Academy Trust
A Catholic Academy

May 2019

Calculation Policy

Contents

Calculation Policy

What is this policy for?

This policy is intended to demonstrate how we teach different forms of calculation at Our Lady's School. It is organized by year groups. In the KS2 tests at the end of year 6, children are expected to use written formal methods for all four operations (addition, subtraction, multiplication and division).

This policy is designed to help teachers and staff members at the school ensure that calculation is taught consistently across the school and to aid them in helping children who may need extra support or challenges.

This policy is also designed to help parents, carers and other family members support children's learning by letting them know the expectations for their child's year group and by providing an explanation of the methods used in our school.

How do I use this policy?

Each page follows a similar format to help you find the information you need. Addition is paired with subtraction and division with multiplication as these operations are the inverse (opposite) of each other.

These are the objectives from the National Curriculum.

These examples show you the types of work and methods that children will be using in class.

This is some of the vocabulary that will be used in lessons and that the children are expected to know.

Calculation Policy

Early Years Foundation Stage

Objectives (Early Learning Goal)
- Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer.

What adults could do:
- Use mathematical vocabulary and demonstrate methods of recording, using standard notation where appropriate
- Encourage children to make up their own story problems for other children to solve.

Addition	Subtraction
Finds the total number of items in two groups by counting all of them 3 + 2	**Subtraction as take away (using objects or drawing and crossing out).** 6 – 2 =
Vocabulary: add, plus, and, altogether, more, make, sum, total, how many more to make?	Vocabulary: Subtract, take away, minus, leave, less, left over, how many are left, how many are gone, fewer
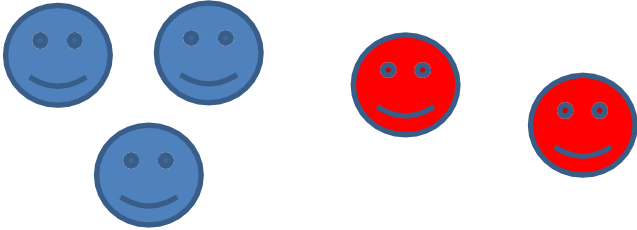
Calculation Policy

Early Years Foundation Stage

Objectives (Early Learning Goal)
- Solve problems, including doubling, halving and sharing.
  What adults can do:
- Use mathematical vocabulary and demonstrate methods of recording, using standard notation where appropriate.
- Talk about the methods children use to answer a problem they have posed, e.g. 'Get one more, and then we will both have two.'
- Encourage children to extend problems, e.g. "Suppose there were three people to share the bricks between instead of two."

Multiplication	Division
Practical ways of doubling Find that many again. I have 3 apples, can you double the number of apples? There are 6 apples in total. 	**Practical ways of halving** Give half of these pencils to the next table. **Practical ways of sharing** Share these strawberries between 3 children– how many will they have each? Each child will get 3 strawberries
Vocabulary: Doubles, groups.	Vocabulary: Sharing, into groups, , halve, share, one each… two each… three each etc.
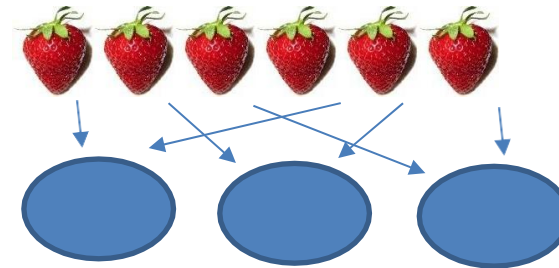
Calculation Policy

Year 1

Objectives:
- read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs
- represent and use number bonds and related subtraction facts within 20
- add and subtract one-digit and two-digit numbers to 20, including zero

- Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ☐ − 9.
- Pupils memorise and reason with number bonds to 10 and 20 in several forms (for example, 9 + 7 = 16; 16 − 7 = 9; 7 = 16 − 9). They should realise the effect of adding or subtracting zero. This establishes addition and subtraction as related operations.
- Pupils combine and increase numbers, counting forwards and backwards.
- They discuss and solve problems in familiar practical contexts, including using quantities. Problems should include the terms: put together, add, altogether, total, take away, distance between, difference between, more than and less than, so that pupils develop the concept of addition and subtraction and are enabled to use these operations flexibly.

Addition	Subtraction
Count on using number tracks / number lines / 100 grids to support. **Record related number facts.** e.g. 4 +5 = 9, 5 + 4 = 9, 9 = 4 + 5, 9 = 5 + 4 **Develop understanding of the equals sign / equality and the concept of 'empty box' questions. Record solutions to calculations such as 4 + ☐ = 9.** **Use practical apparatus e.g. counters, multilink, objects etc.**	**Count back using number tracks / number lines / 100 grids to support the development of the concept of subtraction as take away.** **Develop subtraction facts initially to ten and then to 20. Record related number facts (and make links to related addition facts)** e.g. 9 - 4 = 5, 9 - 5 = 4 Develop understanding of the equals sign / equality and the concept of 'empty box' questions. Record solutions to calculations such as 9 - ☐ = 5. **Use practical apparatus e.g. counters, multilink, objects etc.**
Vocabulary: Add, plus, and, altogether, more, make, sum, total, how many more to make?	Vocabulary: subtract, take away, minus, leave, less, left over, how many are left? How many are gone? Find the difference.

Calculation Policy

Year 1

Objectives:
- 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.
- Through grouping and sharing small quantities, pupils begin to understand: multiplication
- and division; doubling numbers and quantities; and finding simple fractions of objects, numbers and quantities.
- They make connections between arrays, number patterns, and counting in twos, fives and tens.

Multiplication	Division
x2, x5, x10 – Practical methods **Counting aloud in jumps of the above amounts** 0, 2, 4, 6, 8, 10, 12, 14… 0, 5, 10, 15, 20, 25… 0, 10, 20, 30, 40, 50… **Repeated addition** **Number line** **5x2=10**	Develop division as sharing Develop division as repeated grouping (repeated subtraction of sets of the same size) using practical apparatus and diagrams. How many sets of two stars could you make with ten stars? 5 sets. 10 stars give five sets of two stars.
Vocabulary: Lots of, groups, repeat, same size.	Vocabulary: Sharing into groups, fairly, equal, halve, share, one each…two each…three each… etc.
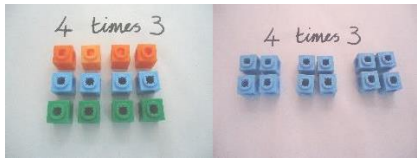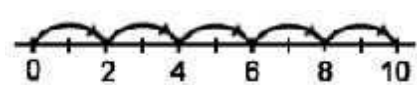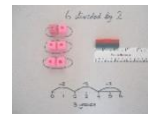
Calculation Policy

Year 2

Objectives:
- solve problems with addition and subtraction:
- using concrete objects and pictorial representations, including those involving numbers, quantities and measures
- applying their increasing knowledge of mental and written methods
- 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: 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 and use this to check calculations and solve missing number problems.
- Pupils extend their understanding of the language of addition and subtraction to include sum and difference.
- Pupils practise addition and subtraction to 20 to become increasingly fluent in deriving facts such as using $3 + 7 = 10$; $10 − 7 = 3$ and $7 = 10 − 3$ to calculate $30 + 70 = 100$; $100 − 70 = 30$ and $70 = 100 − 30$. They check their calculations, including by adding to check subtraction and adding numbers in a different order to check addition (for example, $5 + 2 + 1 = 1 + 5 + 2 = 1 + 2 + 5$). This establishes commutativity and associativity of addition.
- Recording addition and subtraction in columns supports place value and prepares for formal written methods with larger numbers.

Addition	Subtraction

Continue to use practical apparatus e.g. counter, blocks, objects etc.
Develop understanding of partitioning and place value and use this to support addition.
 	
TU + U   **TU + TU**   **HTU + TU**
41+ 8   42+33
40 + 1 + 8   40 + 30 (collect the 'tens' together)
40 + 9= 49   2+3 (collect the 'units' together)
              70 + 5 = 75 (add the totals together)
Practical apparatus is used to support this, as are number tracks /100 squares and number lines (numbered and empty). Record the outcomes of calculations in horizontal format.
 	
When confident with concepts of partitioning and place value, horizontal recording can be replaced with recording in columns with a focus on place value.
 	
   T U
   4   1
+   8
   4   9
	Continue to use practical apparatus e.g. counter, blocks, objects etc.
	Develop understanding of partitioning and place value and use this to support subtraction.
	
	TU - U TU - TU HTU – TU
	41-8 33-12 If the units are larger than the amount being subtracted 33-17
	40-1-7 30-10=20 (subtract the 'tens') start from 33
	40-8=33 3-2=1 (subtract the 'units') subtract the ten 33-10=23
	           20+1=21 (add the two totals together) subtract the unit 23-7=16
	           33-12=21
	Practical apparatus are used to support this, as are number tracks /100 squares and number lines (numbered and empty).
	Record the outcomes of calculations in horizontal format.
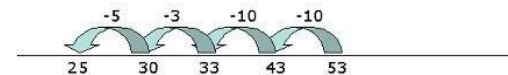	
	41 – 8 = 33
	When confident with concepts of partitioning and place value, horizontal recording can be replaced with recording in columns with a focus on place value.
	When using column subtraction, children are not expected to be borrowing / exchanging in Year 2
	   T U
	   4 8
	- 7

Vocabulary: Add, addition, plus, and, altogether, more, make, sum, total, increase, number line, count on, partition, inverse.	Vocabulary: subtract, subtraction, take away, minus, leave, less, left over, how many are left? How many are gone? Inverse, decrease, difference, fewer than. **Borrowing should not be used as a term because it implies that the borrowed number needs to go back. It is included here as it used to be a common term.**

Calculation Policy

Year 2

- recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
- calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs
- 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.
- Pupils use a variety of language to describe multiplication and division.
- Pupils are introduced to the multiplication tables. They practise to become fluent in the 2, 5 and 10 multiplication tables and connect them to each other.
- They connect the 10 multiplication table to place value, and the 5 multiplication table to the divisions on the clock face.
- They begin to use other multiplication tables and recall multiplication facts, including using related division facts to perform written and mental calculations.
- Pupils work with a range of materials and contexts in which multiplication and division relate to grouping and sharing discrete and continuous quantities, to arrays and to repeated addition.
- They begin to relate these to fractions and measures (for example, 40 ÷ 2 = 20, 20 is a half of 40). They use commutativity and inverse relations to develop multiplicative reasoning (for example, 4 × 5 = 20 and 20 ÷ 5 = 4).

Multiplication	Division
Develop an understanding of multiplication using arrays and number lines showing repeated groups.	Develop an understanding of division using arrays and number lines showing repeated groups

Multiplication

Develop an understanding of multiplication using arrays and number lines showing repeated groups.

```
  4 x 5                    5 x 4
 OOOOO                    OOOO
 OOOOO                    OOOO
 OOOOO                    OOOO
 OOOOO                    OOOO
                         OOOO
4 rows of 5              5 rows of 4
```

Use number lines to show repeated grouping (repeated addition of sets of the same size).
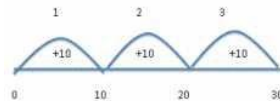
3 x 10 (3 jumps of 10)

Division

Develop an understanding of division using arrays and number lines showing repeated groups

Use number lines to show repeated grouping (repeated subtraction of sets of the same size)
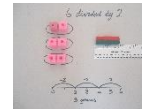
Division as repeated subtraction using a number line.
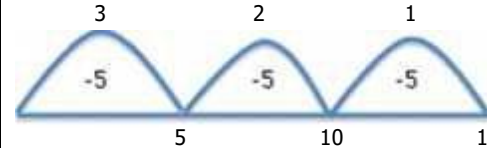
Start at 15. Jump back in fives until zero is reached.
Count the number of jumps.
15 ÷ 5 = 3

Questions that give rise to remainders.
Use the 'array' format above.
17 ÷ 5 =

OOOOO 1 Three groups of 5
OOOOO 2 2 left over (remainder)
OOOOO 3 17 ÷ 5 = 3 remainder 2
OO

Vocabulary: Lots of groups, repeat, same size, times, multiply, jumps of, steps of, multiplied by, multiple of, array, row, column, double, repeated addition.

Vocabulary: sharing, share equally, into groups, fairly, equal, halve, share, one each…two each…three each… etc., divided by, divided into, left over, remainder, how many groups?

Calculation Policy

Year 3

Objectives:
- add and subtract numbers mentally, including: ; a three-digit number and ones; a three-digit number and tens; a three-digit number and hundreds
- add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction
- estimate the answer to a calculation and use inverse operations to check answers
- Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.
- Pupils practise solving varied addition and subtraction questions. For mental calculations with two-digit numbers, the answers could exceed 100.
- Pupils use their understanding of place value and partitioning, and practise using columnar addition and subtraction with increasingly large numbers up to three digits to become fluent

Addition	Subtraction

Continue to develop understanding of partitioning and place value and use this to support addition.
 	
Use practical apparatus to support this, as are number tracks /100 squares and number lines.
 	
Where units combine to make totals greater than 10, regroup using partitioning skills
25 + 36
20 + 30 = 50
5 + 6 = 11
50 + 11 = 50 + 10 + 1= 61
 	
Pupils continue to determine when calculations are best carried out using mental strategies.
 	
Record in columns with a focus on place value. Use expanded recording and apparatus to illustrate concept initially if required before moving towards the formal written method.
TU + TU   HTU+TU HTU+HTU
 	
  T U   H T U
  2 5   5 6 7
+ 3 6   + 5 4
  6 1   6 2 1
   1   1 1
	Continue to develop understanding of partitioning and place value and use this to support subtraction.
	
	Use practical apparatus to support this, as are number tracks /100 squares and number lines.
	
	Use expanded recording and apparatus to illustrate concept initially if required before moving towards the formal written method.
	No exchange
	T U
	 4 8 40 + 8
	- 7 → - 7
	            40 + 1 = 41
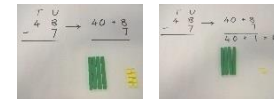	
	becomes
	 T U
	 4 8
	- 7 4 1
	
	Exchange / Borrowing
	 T U
	 4 7 40 + 7 30 + 17
	- 8 → - 8 → - 8
	                  30 + 9 = 39
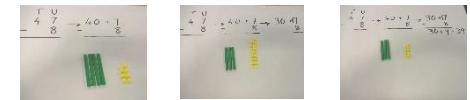	
	becomes
	 T U
	 4 7 4 7
	- 8 → - 8
	 4 1 3 9

Vocabulary: Add, addition, plus, and, altogether, more, make, sum, total, increase, number line, count on, partition, inverse, how many more to make? How many more is_____than_____? Hundreds, tens, units.	Vocabulary: subtract, subtraction, take away, minus, decrease, leave, less, left over, how many are left/left over? How many are gone? Inverse, decrease, difference, fewer than, more than, hundreds, tens, units, boundary, how much less is ____than ___? **Borrowing should not be used as a term because it implies that the borrowed number needs to go back. It is included here as it used to be a common term.**

Calculation Policy

Year 3

Objectives:
- recall and use multiplication and division facts for the 2,3, 4, 5, 8 and 10 multiplication tables
- 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
- 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.
- Pupils continue to practise their mental recall of multiplication tables when they are calculating mathematical statements in order to improve fluency.
- Through doubling, they connect the 2, 4 and 8 multiplication tables.
- Pupils develop efficient mental methods, for example, using commutativity and associativity (for example, $4 \times 12 \times 5 = 4 \times 5 \times 12 = 20 \times 12 = 240$) and multiplication and division facts (for example, using $3 \times 2 = 6$, $6 \div 3 = 2$ and $2 = 6 \div 3$) to derive related facts (for example, $30 \times 2 = 60$, $60 \div 3 = 20$ and $20 = 60 \div 3$).
- Pupils develop reliable written methods for multiplication and division, starting with calculations of two-digit numbers by one-digit numbers and progressing to the formal written methods of short multiplication and division.
- Pupils solve simple problems in contexts, deciding which of the four operations to use and why. These include measuring and scaling contexts, (for example, four times as high, eight times as long etc.) and correspondence problems in which m objects are connected to n objects (for example, 3 hats and 4 coats, how many different outfits?; 12 sweets shared equally between 4 children; 4 cakes shared equally between 8 children).

Multiplication	Division

Develop the use of x and = symbols to record calculations horizontally.
Use arrays and other practical apparatus to illustrate commutativity (that multiplication calculations can be carried out in any order) e.g. 2 x 5 arrives at the same product as 5 x 2.
Begin to derive new facts from known facts
e.g. 3 x 2 = 6 (known fact)
30 x 2 = 60
300 x 2 = 600 etc.
Begin to use understanding of place value and partitioning to carry out multiplication of two-digit by one -digit numbers

15 x 4

10 5

10 x   4 = 40

5 x   4 = 20

40 + 20 = 60
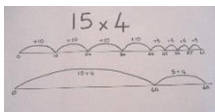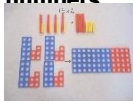
Begin to use grid approaches to illustrate as appropriate using practical apparatus to support.

	10	5
4	40	20
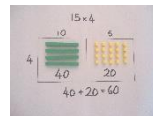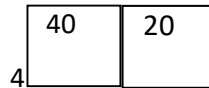
Develop the use of ÷ and = symbols to record calculations horizontally
Use arrays and other practical apparatus to illustrate making of repeated groups
Begin to derive new facts from known facts
e.g. 6 ÷ 2 = 3 (known fact)
60 ÷ 2 = 30
600 ÷ 2 = 300
Begin to carry out division of two- digit by one -digit numbers, first without remainders, then introducing remainders, illustrating this using informal methods first if required.
27 ÷ 3
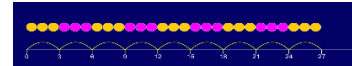
Division using larger multiples of the divisor, first with no remainders, then with remainders
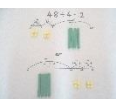
48 ÷ 4   **49 ÷ 4**

Numberline (with remainders)
18 ÷ 4 =
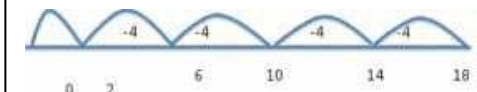
Four jumps of 4 with 2 left over
18 ÷ 4 = 4 remainder 2

Vocabulary: lots of, groups, repeat, same size, times, multiply, jumps of, steps of, multiplied by, multiple of, array, row, column, double, repeated addition, product, grid method.

Vocabulary: sharing, equally, into groups, fairly, equal, halve, share, one each…two each…three each… etc. divided by, divided onto, left over, remainder, how many groups?

Calculation Policy

Year 4

Objectives:
- Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate
- Estimate and use inverse operations to check answers to a calculation
- Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.
- Pupils continue to practise both mental methods and columnar addition and subtraction with increasingly large numbers to aid fluency

Addition	Subtraction

Expanded column method (units first)
215 + 133
 	
    215
  + 133
     8 (5 + 3 = 8)
   40 (10 + 30 = 40)
  300 (200 + 100 = 300)
  348
 	
Compact column
215 + 133   OR   226 + 193
 	
  215   226
+ 133   + 193
 348   419
                1
Ensure that on the middle column, children are taught to say '20 + 90' as opposed to '2 + 9' and for the hundreds column '200 + 100 'instead of '2 + 1'.
	Expanded partitioning with borrowing
	193 − 66
	
	            80 13
	  193 = 100 + 90 + 3
	  - 66 = 60 + 6
	  127 = 100 + 20 + 7
	
	Compact column
	193 − 66
	
	      8
	  1 9¹3
	- 6 6
	  1 2 7

Vocabulary: add, addition, plus, make, more, sum, total, increase, inverse, altogether, how many more to make___? How many more is_____than_____? Number line, partition, hundreds, tens, units, count on.	Vocabulary: subtract, subtraction take away, minus, decrease, leave, how many are left/left over? More than, fewer than, difference, tens/hundreds boundary, how much more/less is ?, inverse.

Calculation Policy

Year 4

Objectives:
- 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
- multiply two-digit and three-digit numbers by a one-digit number using formal written layout
- 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.
- Pupils continue to practise recalling and using multiplication tables and related division facts to aid fluency.
- Pupils practise mental methods and extend this to three-digit numbers to derive facts, (for example $600 \div 3 = 200$ can be derived from $2 \times 3 = 6$).
- Pupils practise to become fluent in the formal written method of short multiplication and short division with exact answers (see Mathematics Appendix 1).
- Pupils write statements about the equality of expressions (for example, use the distributive law $39 \times 7 = 30 \times 7 + 9 \times 7$ and associative law $(2 \times 3) \times 4 = 2 \times (3 \times 4)$).
- They combine their knowledge of number facts and rules of arithmetic to solve mental and written calculations for example, $2 \times 6 \times 5 = 10 \times 6 = 60$.
- Pupils solve two-step problems in contexts, choosing the appropriate operation, working with increasingly harder numbers. This should include correspondence questions such as the numbers of choices of a meal on a menu, or three cakes shared equally between 10 children.

Multiplication	Division

Multiplication

Using the Grid Method for TU x TU

23 x 28

$$400 + 60 = 460$$
$$160 + 24 = 184$$
$$460 + 184 = 644$$
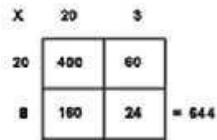
X	20	3
20	400	60
8	160	24	= 644

Develop expanded recording in columns and then move to formal written method, using practical apparatus to support as required.
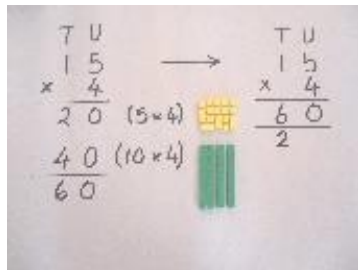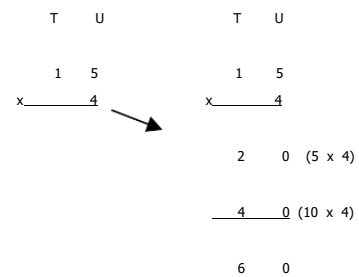
Division

Moving into more formal vertical method

$161 \div 7 =$
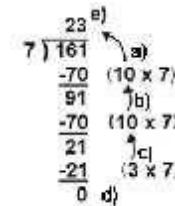
Move to develop the standard method for short division, first with no remainders, then with remainders
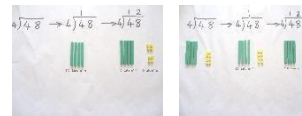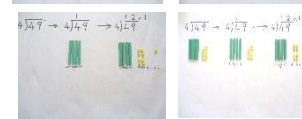
$48 \div 4$

$49 \div 4$

Children will generally be moved on to the formal method of short division as soon as they are able. The other methods illustrated may be used as teaching tools to help children understand the basic concept.

Practical equipment may be used to introduce how short division works.

Vocabulary: lots of, groups, repeat, same size, times, multiply, jumps of, steps of, multiplied by, multiple of, array, row, column, double, repeated addition, product, grid method, short multiplication.

Vocabulary: sharing, share equally, into groups, fairly, equal, halve, share, divided by, divided into, left over, remainder, how many groups, factor, divisible by, chunking, inverse, quotient.

Calculation Policy

Years 5 & 6

Objectives:
- add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)
- add and subtract numbers mentally with increasingly large numbers
- use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
- Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.
- Pupils practise using the formal written methods of columnar addition and subtraction with increasingly large numbers to aid fluency
- They practise mental calculations with increasingly large numbers to aid fluency (for example, 12 462 − 2300 = 10 162).
- **In the KS2 tests at the end of Year 6, children are expected to use the formal methods for addition and subtraction.**

Addition	Subtraction

Add larger numbers (including hundreds and thousands) or decimal amounts using partitioning and place value to support this.
2.9 + 1.7
2 + 1 = 3
0.9 + 0.7 = 1.6
3 + 1.6 = 4.6
 	
Formal (compact column)
2763 + 1438
   2763
 + 1438
   4201
    111
 	
Extend to numbers with any number of digits and decimals with 1 and 2 decimal places.
e.g. 124.9 + 117.25 = 242.15 (can use a number line also to support if necessary)
 	
  124.9
+ 117.25
  242.15
   11
Revert to expanded methods if the children experience any difficulty.
	Find the difference between the two numbers by adding from 187 to 228 (working left to right).
	187 + 13 = 200 200 + 20 = 220 220 + 8 = 228
	13 + 20 + 8 = 41
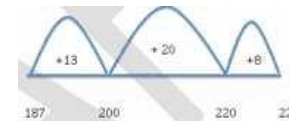	
	Number line should always be used in favour of formal vertical methods when subtracting between close amounts e.g. 2008 − 1996. You just need to jump from 1996 to 2000 (+4), then 2000 to 2008 (+8). 4 + 8 = 12, therefore 2008 − 1996 = 12.
	
	Formal
	
	   ¹
	  2¹2 8
	 - 1 8 7
	  0 4 1
	Answer: **41**
	Start with the units 8 − 7 = 1
	Then the tens 2 (20) - 8 (80). *Take one group of hundred from 2 (200).*
	                    120 - 80 = 40.
	Finally, the hundreds column 1 (100) - 1 (100) = 0
	Leaving an answer of 41.

Vocabulary: add, addition, plus, make, more, sum, total, increase, inverse, altogether, how many more to make___? How many more is_____than_____? Number line, partition, hundreds, tens, units, count on.	Vocabulary: subtract, subtraction take away, minus, decrease, leave, how many are left/left over? More than, fewer than, difference, tens/hundreds boundary, how much more/less is____?

Calculation Policy

| Year 5 |
| --- |

Objectives:
- Pupils practise to become fluent in the formal written method of short multiplication and short division with exact answers
- Pupils write statements about the equality of expressions (for example, use the distributive law $39 \times 7 = 30 \times 7 + 9 \times 7$ and associative law $(2 \times 3) \times 4 = 2 \times (3 \times 4)$).
- They combine their knowledge of number facts and rules of arithmetic to solve mental and written calculations for example, $2 \times 6 \times 5 = 10 \times 6 = 60$.
- Pupils solve two-step problems in contexts, choosing the appropriate operation, working with increasingly harder numbers. This should include correspondence questions such as the numbers of choices of a meal on a menu, or three cakes shared equally between 10 children.
- recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)
- solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes
- solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
- solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.
- Pupils practise and extend their use of the formal written methods of short multiplication and short division. They apply all the multiplication tables and related division facts frequently, commit them to memory and use them confidently to make larger calculations.
- They use and understand the terms factor, multiple and prime, square and cube numbers.
- Pupils interpret non-integer answers to division by expressing results in different ways according to the context, including with remainders, as fractions, as decimals or by rounding (for example, $98 \div 4 = 498 = 24$ r $2 = 2421 = 24.5 \approx 25$).
- Pupils use multiplication and division as inverses to support the introduction of ratio in year 6, for example, by multiplying and dividing by powers of 10 in scale drawings or by multiplying and dividing by powers of a 1000 in converting between units such as kilometres and metres.
- Distributivity can be expressed as $a(b + c) = ab + ac$.
- They understand the terms factor, multiple and prime, square and cube numbers and use them to construct equivalence statements (for example, $4 \times 35 = 2 \times 2 \times 35$; $3 \times 270 = 3 \times 3 \times 9 \times 10 = 92 \times 10$).
- Pupils use and explain the equals sign to indicate equivalence, including in missing number problems (for example, $13 + 24 = 12 + 25$; $33 = 5 \times$).

Multiplication	Division
Extend written approaches to HTU x U, then to ThHTU x U Illustrate using partitioning approaches or grid approaches as required 215×4 200 10 5 $200 \times 4 = 800$ $10 \times 4 = 40$ $5 \times 4 = 20$ $800 + 40 + 20 = 860$ | 200	10	5 | 4	800	40	20 | $800 + 40 + 20 = 860$ 	Extend written calculation methods to more complex problems involving larger numbers, firstly with no remainders. No carrying forward required Example: $448 \div 4$ (as in Year 4, but with additional hundreds column) No carrying forward required, but with remainders $449 \div 4$ (as in year 4, but with additional hundreds column) Carrying forward required $536 \div 4$ Carrying forward required, but with remainders $539 \div 4$ Children will generally be moved on to the formal method of short division as soon as they are able. The other methods illustrated may be used as teaching tools to help children understand the basic concept. Practical equipment may be used to introduce how short division works.

| Year 5	
Multiplication (part 2)	Division (part 2)
Develop expanded recording in columns and then move to formal written method, using practical apparatus to support as required.	Practical equipment may also be used to help children understand the process of division.

Multiplication:

```
    H   T   U              H   T   U
    1   1   5              2   1   5
x   _____4          x   _____4
    2   0   ( 5  x 4)     8       6   0
    4   0   ( 10 x 4)             2
  8 0   0   ( 200 x 4)
    8   6   0
```


| Vocabulary: lots of, groups, repeat, same size, times, multiply, jumps of, steps of, multiplied by, multiple of, array, row, column, double, repeated addition, product, grid method, short multiplication. | Vocabulary: Sharing, share equally, into groups, fairly, equal, halve, share, divided by, divided into, left over, remainder, how many groups, factor, divisible by, divisibility, chunking, inverse, quotient. |

Calculation Policy

Year 6

Objectives:
- 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
- identify common factors, common multiples and prime numbers use their knowledge of the order of operations to carry out calculations involving the four operations
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.
- solve problems involving addition, subtraction, multiplication and division
- use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.
- Pupils practise addition, subtraction, multiplication and division for larger numbers, using the formal written methods of columnar addition and subtraction, short and long multiplication, and short and long division (see Mathematics Appendix 1 in the national Curriculum).
- They undertake mental calculations with increasingly large numbers and more complex calculations.
- Pupils continue to use all the multiplication tables to calculate mathematical statements in order to maintain their fluency.
- Pupils round answers to a specified degree of accuracy, for example, to the nearest 10, 20, 50 etc., but not to a specified number of significant figures.
- Pupils explore the order of operations using brackets; for example, $2 + 1 \times 3 = 5$ and $(2 + 1) \times 3 = 9$.
- Common factors can be related to finding equivalent fractions.
- **In the KS2 tests at the end of Year 6, children are expected to use the formal methods for multiplication and division.**

Multiplication	Division

Extend written approaches to HTU x TU and ThHTU x TU

Illustrate using grid approaches as required

26 x 13

	20	6
10	200	60
3	60	18

200 + 60 + 60 + 18 = 338

Extend written approaches to the formal method of long division when dividing by two-digit numbers, illustrating this using informal methods first if required.

```
        2 8 r 1 2
15 ) 4  3  2
-    3 0 0   (15x20)
       1 3  2
-      1 2 0  (15x8)
         1  2
```

```
         2 8 r 1 2
15 ) 4  3  2
       3 0
       1 3 2
       1 2 0
         1 2
```

Calculation Policy

Year 6
Multiplication (part 2)

Develop expanded recording in columns and then move to formal written method of long multiplication, using practical apparatus to support as required.

```
    H   T   U                H   T   U
        2   6                     2   6
x       1   3            x        1   3
        1   8  (  6 x 3)          7   8
        6   0  ( 20 x 3)              1
        6   0  (  6 x 10)      2   6   0
    2   0   0  ( 10 x 20)      3   3   8
    3   3   8                     1
        1
```

Develop expanded recording in columns and then move to formal method of long multiplication, using practical apparatus to support as required.

```
    H   T   U                H   T   U
    2   2   6                2   2   6
x       1   3            x        1   3
        1   8  (  6 x 3)       6   7   8
        6   0  ( 20 x 3)               1
    6   0   0  (200 x 3)    2   2   6   0
        6   0  (  6 x 10)   2   9   3   8
    2   0   0  ( 20 x 10)           1
  2   0   0   0  (200 x 10)
    2   9   3   8
            1
```

Children will generally be moved on to the formal method of short division as soon as they are able. The other methods illustrated may be used as teaching tools to help children understand the basic concept.

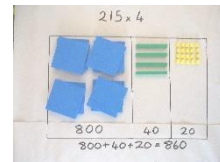Practical equipment may be used to introduce how short division works.

Vocabulary: lots of, groups, repeat, same size, times, multiply, jumps of, steps of, multiplied by, multiple of, array, row, column, double, repeated addition, product, grid method, short multiplication.

Vocabulary: Sharing, share equally, into groups, fairly, equal, halve, share, divided by, divided into, left over, remainder, how many groups, factor, divisible by, divisibility, chunking, inverse, quotient.

Calculation Policy

End of year expectations by year group

These charts cover the end of year expectations for children in each band. They are based on the end of year expectations from the National Curriculum. Each band's skills builds on the skills acquired in the previous band. Children's targets are in the front of the children's books and staff highlight each section when they are happy the children have mastered each skill.

End of EYFS expectations
I can use equipment to show and make any number up to 50 (fifty).
I can count to 50 (fifty) forwards and backwards from any number.
I can count in 2s (twos) and 10s (tens).
I know the number bonds up to 10 (ten).
I can add one-digit numbers including 0 (zero).
I can take away one-digit numbers including 0 (zero).
I can divide by sharing objects into sets that are the same size.
I can divide by grouping objects into groups that are the same size.
I can use arrays to help me multiply numbers.
I can tell the time to the nearest hour.

Calculation Policy

Band 1 Expectations		
If I am BEGINNING this band I can...	If I am WITHIN this band I can...	If I am SECURE in this band I can...
...count forwards from 1 (one) to 50 (fifty).	...count forwards and backwards to 100 (one hundred).	...count forwards and backwards from any number with numbers bigger than 100 (one hundred).
...say one more or one less than any number less than 10 (ten).	...say one more or any less than any number less than 20 (twenty).	...say one more or one less than any number greater than 20 (twenty).
...use objects to help me add and subtract numbers up to 10 (ten).	...add and subtract numbers up to 20 (twenty).	...find the missing number in problems where the answer is less than 20 (twenty) e.g. 7 + ? = 10.
...count objects in lots of 2 (two).	...count objects in groups of 2 (two) and 10 (ten).	...count objects in groups of 2(two), 5 (five) and 10 (ten).
...use objects to help me double and halve numbers up to 10 (ten).	...recall addition and subtraction facts for numbers up to 10 (ten).	...double and halve numbers up to 20 (twenty).
...write and identify numbers greater than 20 (twenty).	...write and identify numbers greater than 50 (fifty).	...write and identify numbers in real-life situations.
...use objects to help me solve one-step multiplication and division problems.	...solve one-step multiplication and division problems using pictures and adult help.	...solve one-step multiplication and division problems using pictures.
...use objects to find pairs of numbers that total less than 10 (ten).	...use objects to find pairs of numbers that total less than 20 (twenty).	...represent and use number bonds to add, subtract, multiply and divide.
...use objects to help me multiply and divide.	...use arrays to help me multiply and divide with help.	...begin to use arrays to help me multiply and divide.
...group objects into two groups in different ways and say which way is two halves.	...say when objects, shapes or numbers are cut into halves or not.	...say if a shape, object or number is cut into halves or quarters or not.
...say when it is [x] o'clock.	...say when it is [x] o'clock and half past the hour with help.	...draw hands on a clock to o'clock and half past the hour.
...say if something happens before or after something else.	...use words to compare two times.	...use words to compare different time intervals.
...say what equipment I need to solve problems with length, height, mass, weight, capacity and volume using non-standard measurements.	...say what equipment I need to solve measuring problems and solve them with help and using standard measurements.	...say what equipment I need to solve measuring problems and solve them using standard measurements.
...use the correct words to compare two objects' length or height.	...use the correct words to compare two objects' length, height, weight, mass, volume and capacity.	...use the correct words to compare lots of objects' length, height, weight, mass, volume and capacity.
...choose a named shape from a group of 2D shapes and find shapes in my classroom and outdoor area with help.	...name 2D shapes even when they are turned around on my own.	...choose a named shape from a selection of 2D shapes on my own and discuss the properties of that shape.
...choose a named shape from a group of 3D shapes with help.	...name 3D shapes even when they are turned around.	...choose a named shape from a selection of 3D shapes on my own and discuss the properties of that shape.

Calculation Policy

Band 2 Expectations		
If I am BEGINNING this band I can...	If I am WITHIN this band I can...	If I am SECURE in this band I can...
...count forward in tens from numbers less than 10 (ten).	...count forward in tens from any number.	...count forward and backward in tens from any number.
...count forwards in steps of 2 (two) to see if a number is even.	...count forwards and backwards in steps of 2 (two) or 5 (five) to see if a number is in the sequence.	...continue sequences that go up and down where the gaps are 2 (two), 3 (three) and 5 (five) to check if numbers are in them.
...add and subtract mentally a one digit number and a two-digit number.	...add and subtract two-digit numbers mentally.	...add and subtract a three-digit and two-digit number mentally.
...say if one number is bigger than another and use the correct symbol between them (< or >).	...order sets of numbers and put the correct symbols between them (<, > and =)	...compare numbers to addition or subtraction calculations.
...use digit cards to create the largest number possible with help.	...use digit cards to make the greatest or smallest number possible with help.	...use digit cards to make the greatest or smallest number possible on my own.
...use my number facts with numbers less than 20 (twenty) help me with adding numbers where the answer is less than 50 (fifty).	...use my number facts with numbers less than 20 (twenty) to help me solve problems where the answer is less than 50 (fifty).	...use addition and subtraction facts to help me with larger numbers.
...recognise odd and even numbers and multiples of 2 (two), 5 (five) and 10 (ten).	...recall all of my 2 (two), 5 (five) and 10 (ten) times tables and can write down some associated division facts.	...recall all the multiplication division facts for the 2 (two), 5 (five) and 10 (ten) times tables.
...use subtraction to help me solve a missing number problem that involves addition with help.	...use the inverse to check addition and subtraction problems with help.	...use the inverse to check addition or subtraction problems.
...use pictorial methods to help me solve addition and subtraction word problems about numbers, quantities and measures.	...use written methods to help me solve addition and subtraction word problems about numbers, quantities and measures.	...choose the correct written method to solve a word problem.
...use objects to help me solve multiplication and division word problems.	...use pictorial methods to help me solve multiplication and division word problems about numbers, quantities and measures.	...use written methods to help me solve multiplication and division word problems about numbers, quantities and measures.
...recall pairs of numbers that add to 10 (ten) and can solve missing number problems with numbers less than 20 (twenty) with help.	...recall addition and subtraction facts for numbers less than 20 (twenty) and can solve missing number problems on my own.	...recall addition and subtraction facts for numbers to 20 (twenty) and can use these to help me with problems with numbers up to 100 (one hundred).
...put objects into four equal groups and know that one group is a quarter and three groups is three quarters.	...can put objects into three or four equal groups and can name and write the fractions.	...can tell if a shape is cut into thirds or quarters and can name the equivalent fractions.
...solve problems where I have to add pennies and the answer is less than £1.	...solve problems where I have to give change from £1.	...solve problems where I have to buy two or more objects and give change from £1.
...answer questions using tally charts or pictograms with help.	...answer questions using tally charts, block diagrams, simple tables or pictograms with help.	...answer questions using tally charts, block diagrams, simple tables or pictograms on my own.
...use data to answer questions about one category.	...answer questions where I have to compare two categories with help.	...answer questions where I have to compare two categories on my own.

Calculation Policy

Band 3 Expectations		
If I am BEGINNING this band I can...	If I am WITHIN this band I can...	If I am SECURE in this band I can...
...count up in lots of 100 (one hundred).	...count up and down in lots of 200 (two hundred).	...count up and down in multiples of 100 (one hundred).
...find 10 (ten) more than any number less than 50 (fifty).	...find 10 (ten) more or less than any number.	...find 100 (one hundred) more or less than any number.
...count in lots of 4 (four.	...count in lots of 8 (eight).	...count in lots of 50 (fifty).
...find the hundreds digit in a three-digit number.	...identify every the value of each digit in a three-digit number.	...use digit cards to make the greatest and smallest three-digit numbers possible.
...use objects to solve number problems with three-digit numbers.	...solve addition, subtraction, multiplication and division problems with three-digit numbers with help.	...solve addition, subtraction, multiplication and division problems with three-digit numbers on my own.
...mentally add and subtract three-digit numbers and one-digit numbers.	...mentally add and subtract three-digit numbers and two-digit numbers.	...mentally add and subtract three-digit numbers.
...recall multiplication facts for the 3 (three), 4 (four) and 8 (eight) times tables and use these to solve problems.	...recall division facts for the 3 (three), 4 (four) and 8 (eight) times tables.	...recall division facts for the 3 (three), 4 (four) and 8 (eight) times tables and use these to solve problems.
...use jottings to help me solve multiplication and division calculations involving two-digit and one-digit numbers.	...solve multiplication and division calculations involving two-digit and one-digit numbers using a formal written method with support.	...solve multiplication and division calculations involving two-digit and one-digit numbers using a formal written method on my own.
...sort objects into equal groups and find a fraction of them with help.	...sort objects into equal groups and find fractions of them on my own.	...sort larger amounts of objects into equal groups and find fractions of them and write the fraction correctly.
...find fractions of objects where the numerator is more than 1 (one) with help.	...find fractions of objects where the numerator is more than 1 (one) on my own.	...find fractions of larger groups of objects where the numerator is more than 1 (one) and write the fraction correctly.
...count up and down in tenths and divide a whole into tenths with help.	...count up and down in tenths and divide more than one whole between 10 (ten) people and say what fraction each person gets with help.	...count up in tenths where the jump is more than 1/10 and divide more than one whole between 10 people and say what fraction each person gets on my own.
...use shapes to find fractions equivalent to ½.	...use shapes to find fractions equivalent to ¼.	...use shapes to find equivalent fractions where the numerator is more than 1 (one).
...place fractions where the numerators is 1 (one) on a number line with help.	...place fractions where the numerators is 1 (one) on a number line on my own.	...place fractions where the numerator is more than 1 (one) on a number line on my own.
...identify the digit after a decimal point as the tenths digit.	...convert tenths to decimals and vice versa.	...use numbers with one decimal place in the context of measurement.
...add simple fractions with the same denominator where the answer is less than one whole.	...add simple fractions with the same denominator where the answer is more than one whole.	...add and subtract fractions with the same denominator where the answer is more than one whole.
...tell the time to the nearest quarter of an hour on a clock marked with Roman numerals.	...tell the time to the nearest minute on a clock marked with Roman numerals.	...convert times between the 12 (twelve) hour and 24 (twenty-four) hour clocks.
...solve problems using money where I have to give change.	...use the same coins to make different amounts.	...solve problems where I have to work out the minimum number of coins needed and the answer is more than £1 (one pound).
...can compare sets of objects to find the longest, heaviest, etc.	...can solve measuring problems where I have to compare 2 (two) objects.	...can solve measuring problems where I have to compare more than 2 (two) objects.
...describe how to move somewhere using the language of right-angles to describe the turns.	...know the difference between a clockwise and anticlockwise turn.	...use the language of right-angles, clockwise and anticlockwise to describe how to get somewhere and then retrace the steps taken.
...answer questions about charts and pictograms where the symbol represents	...answer questions about charts and pictograms where the symbol represents	...answer questions about charts and pictograms with larger values and where

2 (two) objects.	4 (four) objects.	the symbol represents 4 (four) objects.
...draw a bar chart to show information.	...draw tables to collect information with help.	...draw tables to collect information and draw bar charts to show it on my own.
...describe simple 2D and 3D shapes using accurate language.	...sort 2D and 3D shapes in a variety of ways with help.	...sort 2D and 3D shapes in a variety of ways using their properties.
...relate real objects to 2D and 3D shapes with help.	...relate real objects to 2D and 3D shapes on my own.	...find 2D and 3D shapes in my classroom and outside and describe them based on their properties.

Calculation Policy

Band 4 Expectations		
If I am BEGINNING this band I can...	If I am WITHIN this band I can...	If I am SECURE in this band I can...
...count in lots of 1000 (one thousand).	...count in lots of 2000 (two thousand).	...count forwards and backwards where the jump is a multiple of 1000 (one thousand).
...count backwards past 0 (zero) to include negative numbers with help.	...count backwards past 0 (zero) to include negative numbers on my own.	...count forwards and backwards past 0 (zero) in jumps larger than 1 (one).
...use my knowledge of counting in 3s (threes) to help me count in 6s (sixes) and can start to count in 7s (sevens) and 9s (nines).	...can count confidently in 6s (sixes), 7s (sevens), 9s (nines) and 25 (twenty-fives).	...decide if a number is a multiple of 6 (six), 7 (seven), 9 (nine) or 25 (twenty-five) by counting up in those steps.
...choose the smaller or larger number out of two numbers bigger than 1000 (one thousand).	...order sets of numbers bigger than 1000 (one thousand).	...place the correct symbol (<, > or =) between numbers larger than 1000 (one thousand) or calculations.
...round three-digit numbers to the nearest multiple of 10 (ten) or 100 (one hundred).	...round four-digit numbers to the nearest multiple of 10 (ten) or 100 (one hundred).	...round four-digit numbers to the nearest multiple of 10 (ten), 100 (one hundred) or 1000 (one thousand).
...solve two-step real-life problems involving addition and subtraction.	...solve two-step real-life problems involving addition and subtraction on my own and explain why I chose my methods with help and use the inverse to check my answers.	...solve two-step real-life problems involving addition and subtraction and explain why I chose my methods and check them on my own.
...recall all the multiplication facts up to 12 (twelve) x 12.	...recall all the multiplication facts up to 12 (twelve) x 12 and can derive the division facts.	...recall all the multiplication facts up to 12 (twelve) x 12 and can rapidly recall the related division facts.
...use jottings and partitioning to multiply a two-digit by a one-digit number.	...use formal written methods to multiply a two-digit by a one-digit number with help.	...use formal written methods to multiply a two-digit by a one-digit number.
...use a 10 (ten) x 10 square to show 1/10 and 1/100.	...count up in hundredths and can use a 10 (ten) x 10 square to show 1/10 and 1/100.	...use a 10 (ten) x 10 square to show that 1/10 is equivalent to 10/100 and can count up in hundredths where the jump is more than 1/100.
...use shapes to find equivalent fractions where the numerator is 1 (one) and the denominator is less than 10 (ten).	...use shapes to find equivalent fractions where the numerator is more that 1 (one) and the denominator is less than 10 (ten).	...use shapes to find equivalent fractions where the numerator is more that 1 (one) and the denominator is more than 10 (ten).
...place decimals with one place and less than 10 (ten) on a number line and say which integer they are closer to.	...place decimals with one place and greater than 10 (ten) on a number line and say which integer they are closer to.	...round decimals with one place and greater than 10 (ten) to the nearest integer.
...solve two-step problems involving measures or money using simple fractions and numbers with two decimal places.	...solve multi-step problems involving measures or money using simple fractions and numbers with two decimal places.	...solve multi-step problems involving measures or money using fractions and numbers with two decimal places.
...can convert hours to minutes.	...use multiplication to convert larger units of time to smaller ones with help.	...use multiplication to convert larger units of time to smaller ones on my own.
...convert from larger to smaller metric units with help.	...convert from larger to smaller metric units on my own.	...use knowledge of place value and the relationship between units to convert units on my own.
...identify the lines of symmetry in simple shapes and patterns.	...identify the lines of symmetry in shapes and patterns.	...identify the line of symmetry in shapes and patterns even when the mirror line does not dissect the shape.
...sort shapes into a Carroll or Venn diagram with help.	...use the properties of shapes to sort them into a Carroll or Venn diagram using two criteria.	...use the properties of shapes to sort them into a Carroll or Venn diagram with more than two criteria.
...calculate the perimeter and area of a rectangle using centimetres.	...calculate the perimeter and area of a rectangle using metres and centimetres.	...calculate the perimeter and area of a shape made of more than one rectangle or square.
...plot the vertices of a polygon and join them in the correct order to complete the shape with help.	...plot the vertices of a polygon and join them in the correct order to complete the shape on my own.	...plot the vertices of a polygon and find missing vertices when I know the properties of the shape.

...collect data to create bar charts, pictograms, tables and other graphs and can create and answer questions about my data.	...create a line graph to show how something changes over time and can explain why a bar chart would not be appropriate for this.	...create bar charts, pictograms and other graphs using grouped data.

Band 5 Expectations		
If I am BEGINNING this band I can...	If I am WITHIN this band I can...	If I am SECURE in this band I can...
...count forwards through 0 (zero) and other negative numbers.	count forwards and backwards through 0 (zero) and other negative numbers.	...count forwards and backwards through 0 (zero) when I start at any negative or positive number and with jumps of more than 1 (one).
...read and write numbers that are multiples of 100 (one hundred) up to 1,000,000 (one million).	...write a six-digit number and state the value of each digit.	...create a number with 6 (six) digit cards and write it in words.
...compare a negative and positive number.	...compare two negative numbers.	...order sets of negative and positive numbers.
...compare two numbers with up to six digits.	...compare sets of numbers with up to six digits.	...place the correct sign (<, > or =) between two six-digit numbers.
...add and subtract mentally a three-digit number) and a five-digit number that are multiples of 10 (ten).	...add and subtract mentally a three-digit number and a five-digit number.	...add and subtract mentally a four-digit number and a five-digit number.
...solve problems using my knowledge of multiples and square numbers.	...solve problems using my knowledge of multiples, squares, and factors.	...solve problems using my knowledge of multiples, squares, cubes and factors.
...solve problems involving scaling and simple amounts in context.	...solve problems involving scaling and larger amounts in context.	...solve problems involving scaling and fractions with larger amounts in context.
...round numbers less than 1000 (one thousand) to the nearest multiple of 10 (ten), 100 (one hundred) or 1000.	...round numbers less than 10000 (ten thousand) to the nearest multiple of 10 (ten), 100 (one hundred), 1000 (one thousand) or 10000.	...round numbers less than 1000000 (one million) to the nearest multiple of 10 (ten), 100 (one hundred), 1000 (one thousand), 10000 (ten thousand), 1000000 (one hundred thousand) or 1000000.
...know all the factors of numbers below 10 (ten) and know the multiples of all numbers in the 12 (twelve) x 12 multiplication grid.	...know all the factors and multiples of numbers below 20 (twenty) and can find common factors of those numbers.	...know all the factors and multiples of numbers below 50 (fifty) and can find common factors of numbers.
...use columnar methods to add and subtract four-digit numbers with help.	...use columnar methods to add and subtract five-digit numbers with help.	...use columnar methods to add and subtract five-digit numbers on my own.
...write ½ (one half), ¼ (one quarter), 1/5 (one fifth) and tenths as decimals, fractions and percentages.	...turn halves, fifths, quarters and tenths into decimals.	...turn any fraction with a denominator that is a multiple of 10 (ten) or 25 (twenty-five) into a decimal or percentage.
...solve problems which require knowing and comparing the above decimal, fraction and percentage equivalents.	...solve problems which require knowing and comparing the above decimal, fraction and percentage equivalents.	...solve problems which require knowing and comparing the above decimal, fraction and percentage equivalents.
...use pictures to help me compare the size of fractions whose denominators are multiples of the same number.	...identify the smaller fraction from two whose denominators are multiples of the same number and where the denominator is less than 10 (ten).	...identify the smaller fraction from two whose denominators are multiples of the same number and where the denominator is more than 10 (ten).
...use a decimal scale to help me order numbers with 1 (one) or 2 (two) decimal places.	...order two decimal numbers with up two 3 (three) decimal places.	...order two decimal numbers with up two 3 (three) decimal places and write another number between them.
...order mixed and improper fractions with the same denominator.	...order mixed and improper fractions with different denominators with help.	...order mixed and improper fractions with different denominators on my own.
...can convert metric measurements to a smaller or larger unit of measurement with help.	...can convert metric measurements to a smaller or larger unit of measurement on my own	...can convert metric measurements with 1 (one) decimal place to a smaller unit of measurement on my own.
...use a ruler to measure the perimeter of a shape made of rectangles with help and can calculate the perimeter of drawings of shapes when I am given the dimensions.	...use a ruler to measure the perimeter of a shape made of rectangles on my own and can calculate the perimeter of drawings of shapes when I am given the dimensions.	...estimate and use a ruler to measure the perimeter of a shape made of rectangles on my own and can calculate the perimeter of drawings of shapes when I am given the dimensions.
...calculate and compare the areas of rectangles.	...find a single answer to a problem related to the possible area of a rectangle.	...solve problems related to the areas of rectangles with lots of possible answers.

...describe the faces, edges and vertices of a 3D shape.	...identify 3D shapes from perspective drawings.	...identify 3D shapes from isometric or perspective drawings.
...draw an angle of a set number of degrees that is less than 180 and a line of a given distance.	...draw any angle accurately.	...draw any given angle and shapes with the lengths of sides to the nearest millimetre.
...say if a polygon is regular or irregular with help.	...say if a polygon is regular or irregular on my own.	...use Carroll or Venn diagrams to sort shapes with equally sized angles and equally sized sides.
...answer simple problems based on complex tables, such as timetables, with help.	...answer two-step problems based on complex tables, such as timetables, with help.	...answer two-step problems based on complex tables, such as timetables, on my own.
...complete complex tables with help.	...complete complex tables on my own.	...complete complex tables on my own and explain my reasoning.
...use a line graph to answer questions with help.	...use a line graph to answer questions.	...compare two values on a line graph and calculate the difference between them.

Calculation Policy

Band 6 Expectations		
If I am BEGINNING this band I can...	If I am WITHIN this band I can...	If I am SECURE in this band I can...
...calculate the difference between a negative number and 0 (zero).	...calculate the difference between a negative number and a positive number with help.	...calculate the difference between a negative number and a positive number on my own.
...answer problems where I have to compare a positive and a negative number in context.	...answer problems where I have to compare two negative numbers in context.	...answer problems where I have to compare sets of negative numbers in context.
...round any number up to 1000000 (one million) to the nearest 10 (ten), 100 (one hundred), 1000 (one thousand) or 10000 (ten thousand).	...round any three or four-digit number to different degrees of accuracy, such as the nearest 30.	...round any number less than 10,000,000 (ten million) to different degrees of accuracy, such as the nearest 50 (fifty).
...solve two-step addition and subtraction problems in unfamiliar contexts.	...solve multi-step addition and subtraction problems in unfamiliar contexts.	...solve multi-step addition and subtraction problems in unfamiliar contexts and can explain my reasoning.
...multiply a three-digit by a two-digit number using formal methods with jottings to help me.	...multiply a four-digit by a two-digit number using long multiplication.	...multiply a four-digit by a two-digit number using short multiplication.
...divide a three-digit number by a two-digit number using the formal method of long division with jottings to help me.	...divide a four-digit number by a two-digit number using the formal method of long division with jottings to help me.	...divide a four-digit number by a two-digit number using the formal method of long division.
...check my answers to problems and know to round answers in the context of money to 2 (two) decimal places.	...check my answers to problems and know where it is appropriate to round my answers.	...check my answers to any problem and represent my answer in different ways or round it if appropriate.
...know all the decimal and percentage equivalents of halves, quarters and tenths.	...know the decimal and percentage equivalents of halves, quarters, thirds, fifths and tenths.	...know the decimal and percentage equivalents of halves, quarters, thirds, fifths, eights and tenths and can use this to help me solve problems.
...solve division problems where the answer has up to 2 (two) decimal places with jottings and help.	...solve division problems where the answer has up to 2 (two) decimal places using a formal written method.	...solve division problems where the answer has up to 2 (two) decimal places and the divisor is larger than 12 (twelve).
...solve measuring problems where the answer may have 1 (one) decimal place.	...solve measuring problems where the answer may have up to 2 (two) decimal places.	...solve measuring problems where the answer may have up to 3 (three) decimal places.
...sort shapes using a Carroll or Venn diagram using criteria based on the shapes' properties such as symmetry, parallel lines, etc with help.	...sort shapes using a Carroll or Venn diagram with more than two areas using criteria based on the shapes' properties such as symmetry, parallel lines, etc with help.	...sort shapes using a Carroll or Venn diagram with more than two areas using criteria based on the shapes' properties such as symmetry, parallel lines, etc on my own.
...find unknown angles and lengths on triangles, quadrilaterals and regular polygons with help.	...find unknown angles and lengths on triangles, quadrilaterals and regular polygons.	...find unknown angles and lengths on triangles, quadrilaterals and regular polygons in context.
...draw a shape after a translation or reflection with help.	...draw a shape after a translation or reflection on a coordinate grid with help.	...draw a shape after a translation or reflection on a coordinate grid on my own.
...answer simple questions about pie charts.	...compare two segments of a pie chart using fractions and percentages.	...answer complex questions about pie charts which may require estimation.
...create simple pie charts and comment on them and describe what a line graph is showing.	...create pie charts and line graphs and ask and answer questions about them with help.	...create pie charts and line graphs and ask and answer questions about them.
...compare and calculate the mean averages of multiple data sets.	...compare and calculate the mean averages of multiple data sets in context with help.	...compare and calculate the mean averages of multiple data sets in context.
...calculate percentages of amounts in contexts such measuring.	...calculate fractions and percentages in contexts such measuring and money.	...calculate and compare fractions and percentages in contexts such as money or measuring.
...use my knowledge of fractions and multiples to help me solve single-step problems with unequal sharing.	...use my knowledge of fractions and multiples to help me solve two-step problems with unequal sharing with help.	...use my knowledge of fractions and multiples to help me solve two-step problems with unequal sharing.

…know and can use the formula for the area of a rectangle,	…know and can use the formulae for the areas of triangles and rectangles.	…know and can use the formulae for the areas of triangles and a rectangles in context and can use these to find the area of compound shapes.