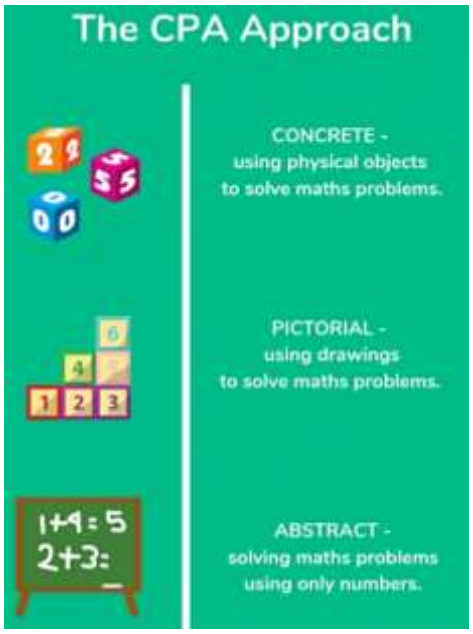
Mathematics Calculation Policy

Reviewer	Date written/reviewed	Review date	Comments
Luke Etheridge (Maths Lead)	October 2020	Summer 2021	New Policy - Introducing CPA approach

This policy demonstrates how we teach the various calculation methods at St Christopher's CE Primary School. It is organised into the four operations and is designed to ensure progression throughout the year groups as outlined in the 'Development Matters in Early Years Foundation Stage' document and 'Programme of Study' in the 2014 National Curriculum.

It includes '☆words' that highlight new vocabulary introduced in each year group and allows pupils to develop their mathematical understanding through a use of representations that are first concrete (e.g. dienes, multilink), then pictorial (e.g. arrays) and finally abstract (e.g. column addition, column multiplication).



Concrete representation - a pupil is first introduced to an idea or skill by acting it out with real objects. This is a 'hands on' strategy and is a foundation for conceptual understanding.

Pictorial representation - a pupil has sufficiently understood the 'hands on' experiences and can now relate them to representations such as pictures or diagrams.

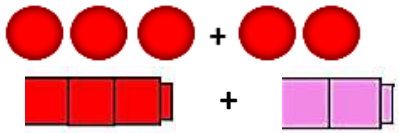
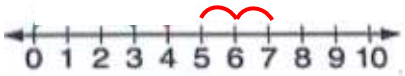
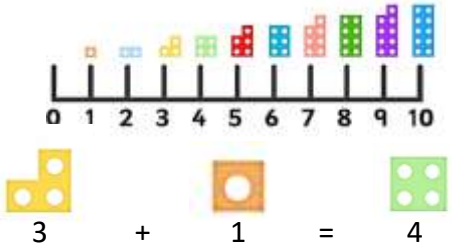
Abstract representation - a pupil is now capable of representing problems by using mathematical notation, e.g. 12 x 2 = 24.

It is important that conceptual understanding, supported by the use of representation and variation is secure and if at any point a pupil is struggling with this, they should revert to concrete and/or pictorial representations to solidify understanding. Pupils may need to revisit previous years' strategies based on their ability as identified by the class teacher and/or SENDCo.

It addition to this, these strategies should be referred to where relevant in other areas of maths to ensure consistency e.g. using column addition to work out the perimeter of a rectilinear shape.

Addition - Early Years

words: add, more, make, altogether, double, one more, count on, how many more to make… ?

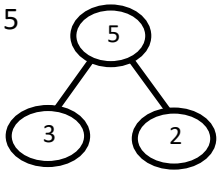
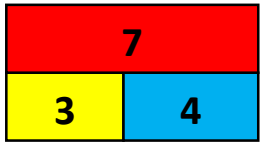
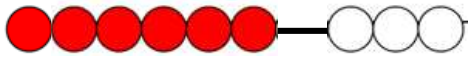
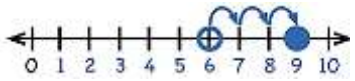
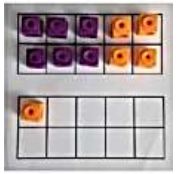
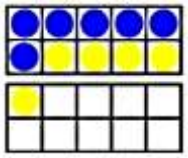
Early Learning Goal	Concrete	Pictorial	Abstract
Add two 1-digit numbers	3 + 2 = 5 	3 + 2 = 5 	3 + 2 = 5
Count on to find the answer	 5 + 2 = 7	5 + 2 = 7 	
One more than a given number	3 + 1 = 4 	 3 + 1 = 4	3 + 1 = 4

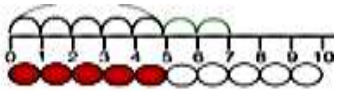
Mental Strategies:

1. Understand the value of a number, e.g. 3 is less than 4
2. Counting forwards and backwards
3. Recall of number bonds to 10.

Addition - Year 1

★ **words:** add, more, **plus**, make, **total**, **equal**, altogether, **inverse**, double, count on, **near double**, **number bonds**, one more, **two more**, **ten more**, **is the same as (including equals sign)**, **difference between**, how many more to make …? **how many more is … than …?**

Strategy/NC Objective	Concrete	Pictorial	Abstract
Add one-digit and two-digit numbers to 20, including zero	3 + 2 = 5 		3 + 2 = 5 
Combining two parts to make a whole	 3 + 4 = 7	 3 + 4 = 7	
Starting at the big number and counting on	6 + 3 = 9 	6 + 3 = 9 	6 + 3 = 9
Regrouping to make 10	6 + 5 = 11 	6 + 5 = 11 	$6 + \square = 11$ $6 + 5 = 5 + \square$ $6 + 5 = \square + 4$

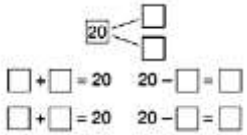
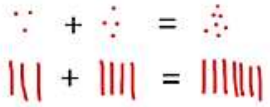
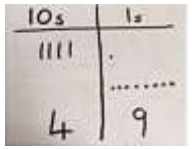
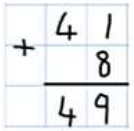
Year 1 continued			
Represent and use number bonds within 20	5 + 2 = 7 	5 + 2 = 7 	2 more than 5 is 7

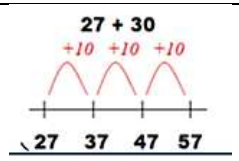
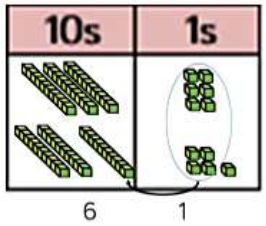
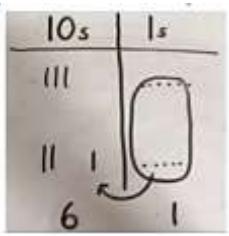
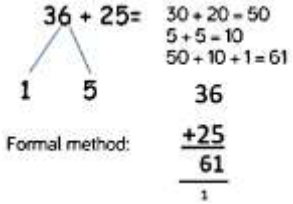
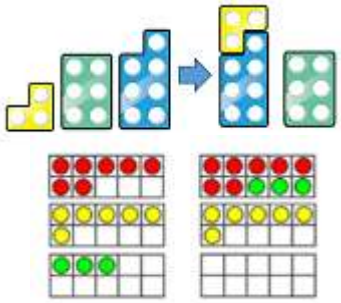
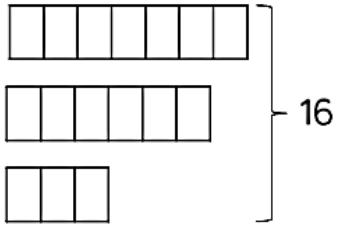
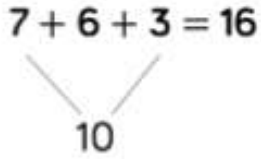
Mental Strategies:

1. Know addition can be carried out in any order
2. Add 1 and 2 digit numbers to 20 including 0
3. Number bonds to 20
4. Doubles of numbers up to and including double 10
5. Adding 10 to a single digit number
6. Identify 1 more than a given number.

Addition - Year 2

★ **words:** add, more, plus, make, total, equal, altogether, inverse, double, count on, near double, number bonds, one more, two more, ten more, **one hundred more**, is the same as (including equals sign), difference between, how many more to make? how many more is … than …? **tens boundary**

Strategy/NC Objective	Concrete	Pictorial	Abstract
Adding multiples of 10	30 + 20 = 50 	 3 tens + 5 tens = __tens 30 + 50 = __	20 + 30 = 50 50 = ? + 20
Using known number facts			? + 1 = 20 20 - 1 = ? 1 + ? = 20 20 - ? = 1
			3 + 4 = 7 **So…** 30 + 40 = 70
Adding a two-digit and one-digit number	41+8 = 49 	41+8 = 49 	41 + 8 = 49 

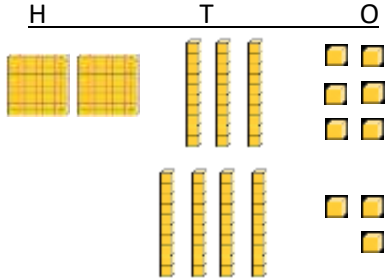
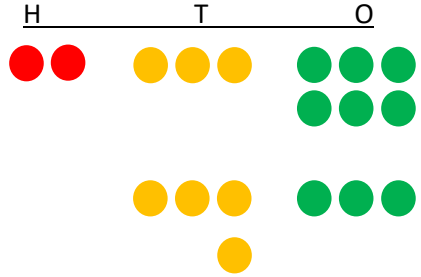
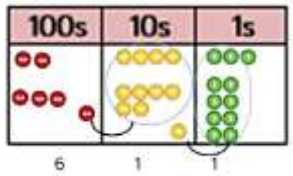
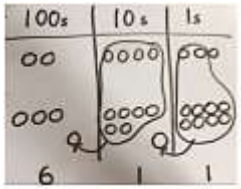
Year 2 continued			
Adding a two-digit number and tens	27 + 10 		27 + 10 = 37 27 + 20 = 47 27 + ? = 57
Adding 2 two-digit numbers	36 + 25 = 61 	36 + 25 = 61 	36 + 25 = 61 
Adding 3 one-digit numbers	7 + 6 + 3 = 16 	7 + 6 + 3 = 16 	

Mental Strategies:

1. Know that addition is the inverse of subtraction
2. Add numbers mentally, including: a 2-digit number and units, a multiple of 10 to a 2-digit number, two 2-digit numbers, three 1-digit numbers
3. Use knowledge of inverse to check calculations and solve missing number problems
4. Use knowledge of number bonds to 10 to calculate numbers bonds to 100
5. Count on in tens from any given number (e.g. 19 – 29 – 39 – 49 etc.).

Addition - Year 3

★ **words:** add, **increase**, more, plus, make, total, equal, altogether, **column addition**, **exchange**, **estimate**, inverse, double, near double, count on, number bonds, one more, ten more, one hundred more, is the same as (including equals sign), difference between, how many more to make? how many more is … than …? tens boundary, **hundreds boundary**

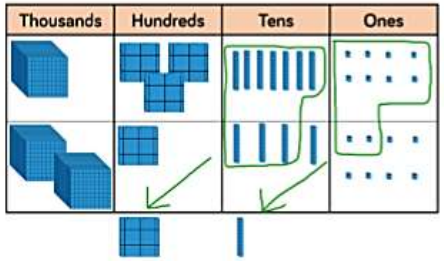
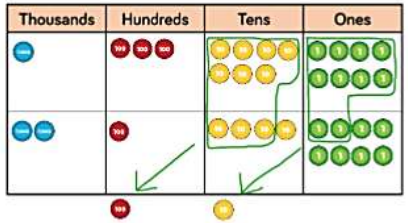
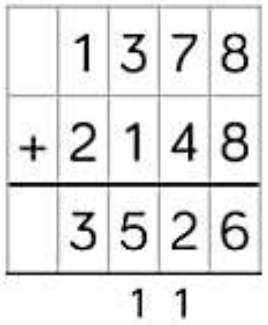
Strategy/NC Objective	Concrete	Pictorial	Abstract
Column addition No regrouping -add with up to three-digit numbers	236 + 43 = 279  Place value counters could also be used.	236 + 43 = 279  Pictorial representations of place value counters.	236 + 43 9 70 200 **279** 236 + 43 **279**
Regrouping -add with up to three-digit numbers	243 + 368 = 611  Dienes could also be used.	243 + 368 = 611  	243 +368 611 1 1

Mental Strategies:

1. Add numbers mentally, including: a three-digit number and a single digit number, a 3-digit number and multiples of 10, a 3-digit number and multiples of 100
2. Estimate the answer to a calculation and use inverse operations to check answers
3. Know number pairs that total 1000 (multiples of 100)
4. Calculate 10 or 100 more than any given number.

Addition - Year 4

★ **words:** add, increase, more, plus, make, total, equal, altogether, column addition, exchange, estimate, inverse, double, near double, count on, number bonds, one more, ten more, one hundred more, **one thousand more**, is the same as (including equals sign), difference between, how many more to make? how many more is … than …? tens boundary, hundreds boundary, **thousands boundary**

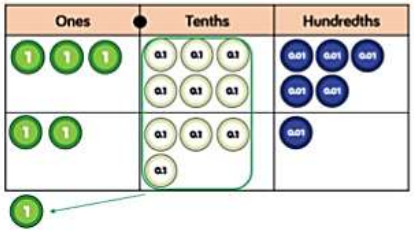
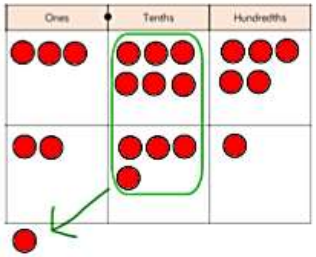
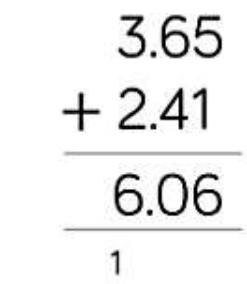
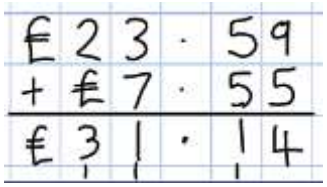
Strategy/NC Objective	Concrete	Pictorial	Abstract
Column addition -add with up to four-digit numbers	1,378 + 2,148 = 3,526  Place value counters could also be used.	1,378 + 2,148 = 3,526  Pictorial representations of place value counters.	

Mental Strategies:

1. Add numbers mentally, including: a four digit number and multiples of one thousand
2. Use knowledge of doubles to derive related facts (e.g 15 + 16 = 31 because 15 + 15 = 30 and 30 + 1 = 31)
3. Know number pairs that total 1000 (multiples of 10)
4. Estimate the answer to a calculation and use inverse operations to check answers.

Addition - Year 5

★ **words:** add, increase, more, plus, make, total, equal, altogether, column addition, exchange, estimate, inverse, double, near double, count on, number bonds, one more, ten more, one hundred more, one thousand more, is the same as (including equals sign), difference between, how many more to make? how many more is … than …? **decimal point**, **ones/units boundary**, tens boundary, hundreds boundary, thousands boundary

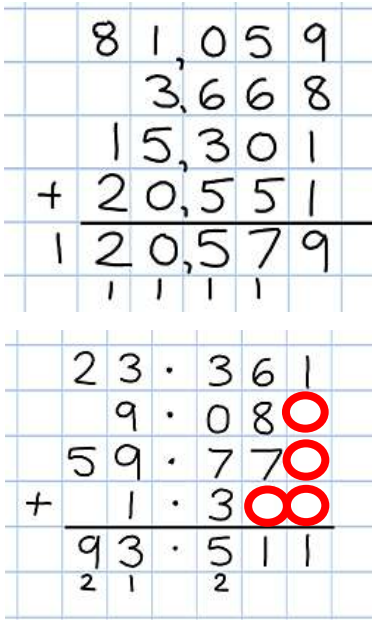
Strategy/NC Objective	Concrete	Pictorial	Abstract
Column addition -add with more than four-digit numbers Add decimals with 2 decimal places, including money	Same as year 4. 3.65 + 2.41 = 6.06 	Same as year 4. 3.65 + 2.41 = 6.06  Pictorial representations of place value counters.	Same as year 4.  

Mental Strategies:

1. Add numbers mentally with increasingly large numbers (e.g 10,162 + 2,300 = 12,462)
2. Mentally add tenths (e.g 0.2 + 0.6 = 0.8) and 1-digit whole numbers and tenths (8 + 0.3 = 8.3)
3. Use number bonds to 100 knowledge to calculate complements to one using hundredths (e.g 0.83 + 0.17 = 1)
4. Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.

Addition - Year 6

words: add, increase, more, plus, make, total, equal, altogether, column addition, exchange, estimate, inverse, double, near double, count on, number bonds, one more, ten more, one hundred, one thousand more, is the same as (including equals sign), difference between, how many more to make? How many more is … than …? **hundredths boundary**, **tenths boundary**, decimal point, ones/units boundary, tens boundary, hundreds boundary, thousands boundary, **order of operations**

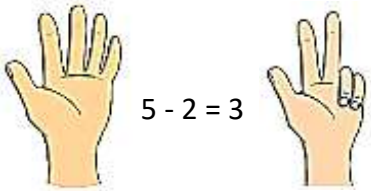
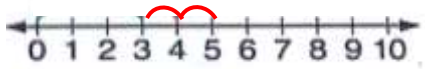
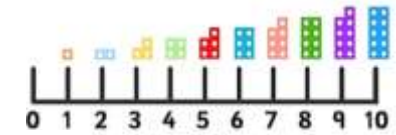
Strategy/NC Objective	Concrete	Pictorial	Abstract
Column addition - add several numbers of increasing complexity Including adding money, measure and decimals with different number of decimal points	Same as year 5.	Same as year 5.	

Mental Strategies:

1. Add numbers mentally with increasingly large numbers (e.g. 10,162 + 2,300 = 12,462)
2. Add decimal numbers mentally (up to 2 decimal places)
3. Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.

Subtraction - Early Years

words: take away, less, count back, one less, how many fewer is…than… ? half, halve

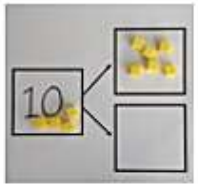
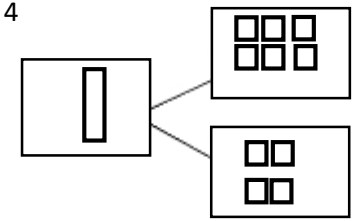
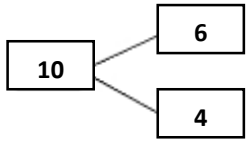
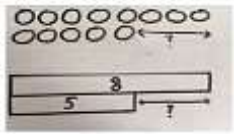
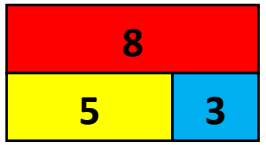
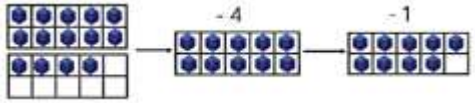
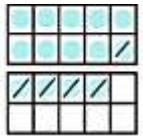
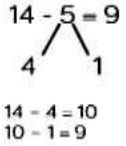
Early Learning Goal	Concrete	Pictorial	Abstract
Subtract two single digit numbers	5 - 2 = 3 	5 - 2 = 3 	5 - 2 = 3
Count back to find the answer	 5 - 2 = 3	5 - 2 = 3 	
One less than a given number	 3 - 1 = 2	 3 - 1 = 2	3 - 1 = 2

Mental Strategies:

1. Develop a mental image of the number system
2. Children count backwards using familiar number rhymes (e.g. ‘10 Green Bottles’)
3. Count backwards from different starting points.

Subtraction - Year 1

words: take away, **minus**, **leave**, less, count back, half, halve, inverse, how many fewer is…than..? **how much less is..? how many are left/left over? how many are gone?**, **one less**, **two less**, **ten less**

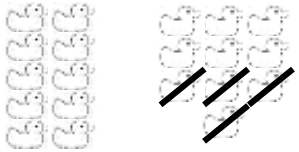
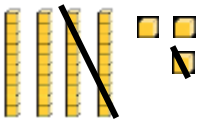
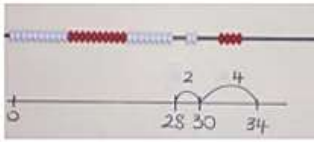
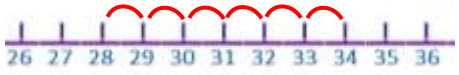
Strategy/NC Objective	Concrete	Pictorial	Abstract
Represent and use subtraction facts within 20	10 - 6 = 4 	10 - 6 = 4 	10 - 6 = 4 
	8 - 5 = ? 	8 - 5 = ? 	
Making 10	14 - 5 = 9 	14 - 5 = 9 	 How many do we need to subtract to get to 10? How many are left to take off?

Mental Strategies:

1. Subtract 1 and 2 digit numbers to 20 including 0
2. To know that subtraction is not commutative and that the larger number must always come first
3. Use knowledge of number bonds to 10 and 20 to reason (9 + 1 = 10 so 10 - 9 = 1 and 10 - 1 = 9).

Subtraction - Year 2

★ **words:** **subtract**, take away, minus, leave, less, count back, half, halve, **inverse**, how many fewer is…than…? how much less is..? half, halve, how many are left/left over? how many are gone? one less, two less, ten less, **one hundred less**, **tens boundary**

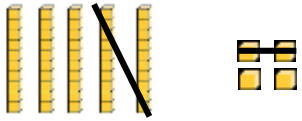
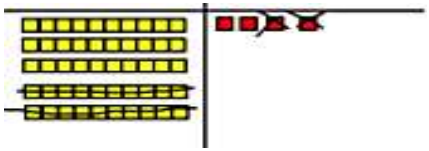
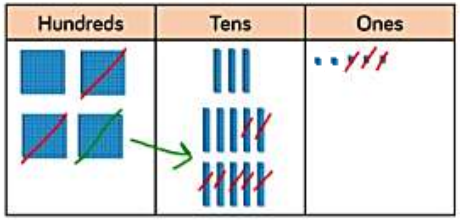
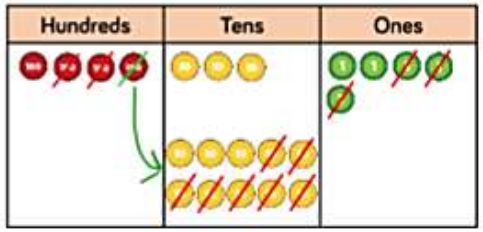
Strategy/NC Objective	Concrete	Pictorial	Abstract
Regrouping a ten into ones	20 - 4 = 16 	 20 - 4 = 16	20 - 4 = 16
Partition to subtract without regrouping	43 - 21 = 22 	43 - 21 = 22 	43 - 21 = 22 **40 3** - **20 1** 20 + 2 = 22
Making 10	34 - 6 = 28 	34 - 6 = 28  Counting on to find the difference.	34 - 6 = 28

Mental Strategies:

1. To know that subtraction is the inverse of addition
2. Use knowledge of inverse to check calculations and solve missing number problems
3. Subtract numbers mentally, including: subtracting units from a 2-digit number, subtracting a multiple of 10 from a 2-digit number, subtracting a 2-digit number from another 2-digit number
4. Recall and use subtraction facts to 20 fluently
5. Use knowledge of number bonds to 100 (multiples of 10) to reason (40 + 60 = 100 so 100 - 60 = 40 and 100 - 40 = 60).

Subtraction - Year 3

★ **words:** subtract, take away, minus, leave, less, count back, half, halve, **column subtraction**, **exchange**, **estimate**, inverse, how many fewer is…than...? how much less is..? how many are left/left over? how many are gone? one less, ten less, one hundred less, tens boundary, **hundreds boundary**

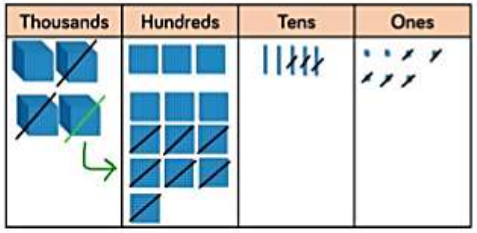
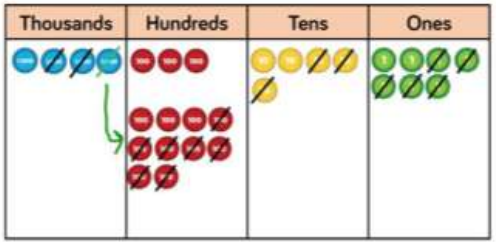
Strategy/NC Objective	Concrete	Pictorial	Abstract
Column subtraction - without regrouping -subtract with up to three-digit numbers	54 - 22 = 32  Place value counters could also be used.	54 - 22 = 32  Pictorial representations of dienes.	50 + 4 - 20 + 2 30 + 2
Column subtraction - with regrouping -subtract with up to three-digit numbers	435 - 273 = 162  Place value counters could also be used.	435 - 273 = 162  Pictorial representations of place value counters.	435 - 273 = 162 3 4 1 4 3 5 − 2 7 3 1 6 2

Mental Strategies:

1. Subtract numbers mentally, including: subtracting a single digit number from a 3-digit number, subtracting a multiple of 10 from a 3-digit number, subtracting a multiple of 10 from a 3-digit number
2. Estimate the answer to a calculation and use inverse operations to check answer.

Subtraction - Year 4

words: subtract, take away, minus, leave, less, count back, half, halve, column subtraction, exchange, estimate, inverse, how many fewer is…than...? how much less is..? how many are left/left over? how many are gone? one less, ten less, one hundred less, **one thousand less**, tens boundary, hundreds boundary, **thousands boundary**

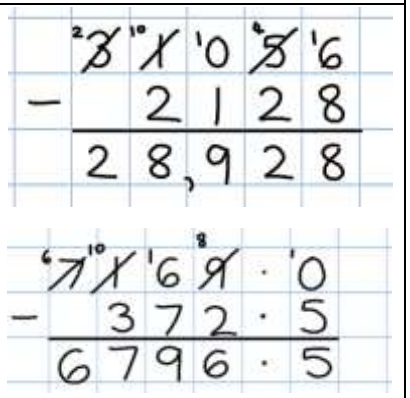
Strategy/NC Objective	Concrete	Pictorial	Abstract
Column subtraction -subtract with up to four-digit numbers	4,357 - 2,735 = 1,622  Place value counters could also be used.	4,357 - 2,735 = 1,622  Children to draw dienes/place value counters and show their regrouping.	4,357 - 2,735 = 1,622 3 1 4357 − 2735 1622

Mental Strategies:

1. Subtract numbers mentally, including: subtracting multiples of one thousand from a 4-digit number
2. Use of number pairs that total 1000 (multiples of 10) to calculate subtraction (e.g. 1000 - 300 = 700)
3. Estimate the answer to a calculation and use inverse operations to check answers.

Subtraction - Year 5

words: subtract, take away, minus, leave, less, count back, half, halve, column subtraction, exchange, estimate, inverse, how many fewer is…than...? how much less is..? how many are left/left over? how many are gone? one less, ten less, one hundred less, one thousand less, **decimal point**, **ones/units boundary**, tens boundary, hundreds boundary, thousands boundary

Strategy/NC Objective	Concrete	Pictorial	Abstract
Column subtraction -subtract with more than four-digit numbers	See year 4	See year 3/4	

Mental Strategies:

1. Subtract increasingly large numbers mentally (e.g. 12, 654 - 1,341 = 11, 213)
2. Mentally subtract tenths (e.g. 0.7 - 0.5 = 0.2) and 1-digit whole numbers and tenths (8 - 0.3 = 7.7)
3. Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.

Subtraction - Year 6

words: subtract, take away, minus, leave, less, count back, half, halve, column subtraction, exchange, estimate, inverse, how many fewer is…than...? how much less is..? how many are left/left over? how many are gone? one less, ten less, one hundred less, one thousand less, **hundredths boundary**, **tenths boundary**, decimal place, ones/units boundary, tens boundary, hundreds boundary, thousands boundary, **order of operations**

Strategy/NC Objective	Concrete	Pictorial	Abstract
Column subtraction -subtract with more complex numbers	See year 4/5	See year 3/4/5	

Mental Strategies:

1. Subtract increasingly large numbers mentally (e.g. 12, 654 - 1,341 = 11, 213)
2. Subtract decimal numbers mentally (up to 2 decimal places)
3. Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.

Multiplication - Early Years

words: groups of, lots of, double

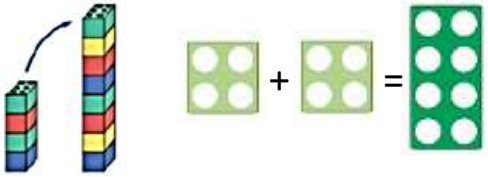
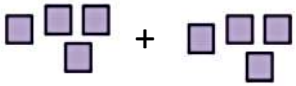
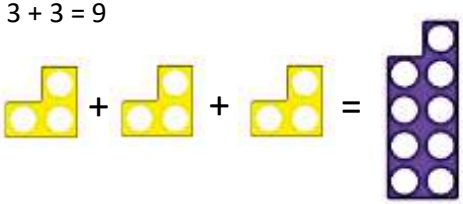
Early Learning Goal	Concrete	Pictorial	Abstract
Solve problems involving doubling	5 + 5 	5 + 5 	5 + 5

Mental Strategies:

1. Develop a mental image of the number system
2. Understand the value of a number - Counting in 2s, 5s and 10s
3. Number patterns on a number line and on a hundred square - 2's, 5's and 10's.

Multiplication - Year 1

★ **words: odd, even, how many times?** lots of, groups of, **repeated addition, array, row,** double

Strategy/NC Objective	Concrete	Pictorial	Abstract
Doubling	4 + 4 = 8 	4 + 4 = 8 	4 + 4 = 8 Double 4 is 8
Counting in multiples of 2, 3, 4, 5 and 10 from 0. - repeated addition	3 + 3 + 3 = 9 	3 + 3 + 3 = 9 	3 + 3 + 3 = 9 Write number sequences involving multiples: 0,2,4,6,8,10 0,3,6,9,12,15 0,5,10,15,20,25,30

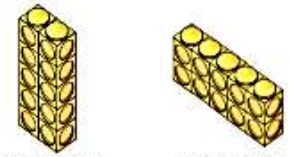
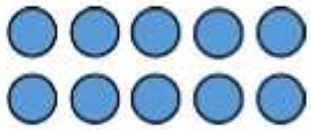
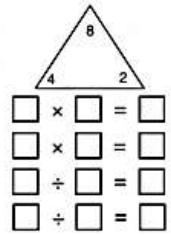
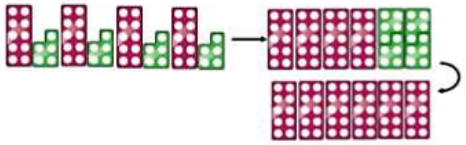
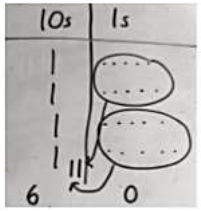
Mental Strategies:

1. Count forwards and backwards in multiples of 2s, 5s and 10s
2. Recall doubles of numbers up to and including 10.

Multiplication - Year 2

(x2, x5, x10)

★ **words:** odd, even, how many times? lots of, groups of, **multiples of two**, **five**, **ten, times, multiply, multiply by, inverse,** repeated addition, **array, row, column,** double, **commutative**

Strategy/NC Objective	Concrete	Pictorial	Abstract
Multiplication is commutative - arrays			2 + 2 + 2 + 2 + 2 = 10 5 + 5 = 10 2 x 5 = 10 5 x 2 = 10
Using the inverse with known number facts	2 x 4 = 8 4 x 2 = 8 8 + 2 = 4 8 + 4 = 2 	2 x 4 = 8 4 x 2 = 8 8 + 2 = 4 8 + 4 = 2 	2 x 4 = 8 4 x 2 = 8 8 ÷ 2 = 4 8 ÷ 4 = 2 8 = 2 x 4 8 = 4 x 2 2 = 8 ÷ 4 4 = 8 ÷ 2
Partition to multiply	4 x 15 = 60 	4 x 15 = 60 	 10 x 4 = 40 5 x 4 = 20 40 + 20 = 60 A numberline could also be used

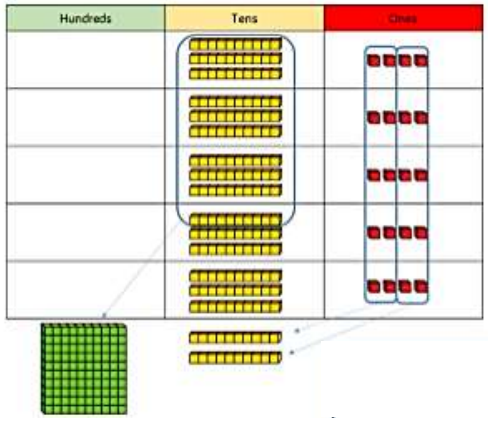
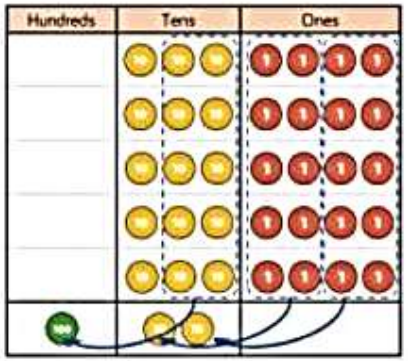
Mental Strategies:

1. Count forwards and backwards in multiples of 3
2. Know the 2, 5 and 10 times tables (in and out of order)
3. Recognise odd and even numbers.

Multiplication - Year 3

(x3, x4, x8)

★ **words:** odd, even, how many times?, lots of, groups of, repeated addition, array, multiply, multiply by, **multiples of threes**, **fours**, **eights**, **fifty**, **one hundred**, **estimate**, inverse, commutative, **product**, **grid method,** repeated addition, array, row, column, double

Strategy/NC Objective	Concrete	Pictorial	Abstract
Grid method moving onto expanded column method - multiply two-digit by one-digit	34 x 5 = 170  Place value counters could also be used.	34 x 5 = 170  Pictorial representations of place value counters.	34 x 5 = 170 x | 30 | 4 5 | 150 | 20 H T U 1 5 0 + 2 0 1 7 0 When confident, move onto expanded column multiplication. H T O 3 4 × 5 2 0 (5 × 4) + 1 5 0 (5 × 30) 1 7 0

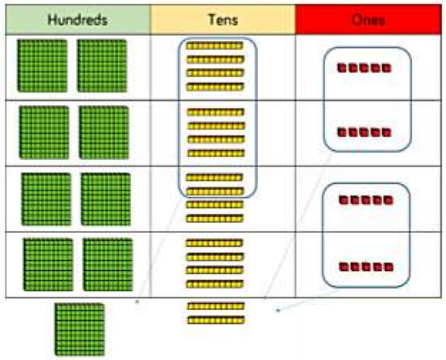
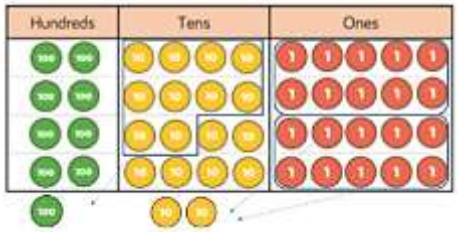
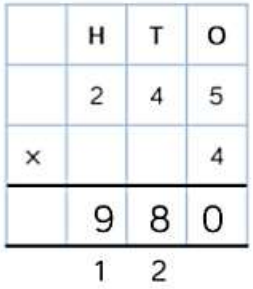
Mental Strategies:

1. Count forwards and backwards in multiples of 4, 8, 50 & 100
2. Know the 3, 4 and 8 times tables (in and out of order)
3. Connect the 2, 4 and 8 times tables through doubling
4. Use knowledge of place value to calculate multiplication (e.g. 2 x 2 = 4, 2 x 20 = 40, 2 x 200 = 400).

Multiplication - Year 4

(up to 12x12)

★ **words:** odd, even, how many times?, lots of, groups of, repeated addition, array, multiply, multiply by, estimate, inverse, commutative, product, grid method, repeated addition, array, row, column, double, **column multiplication**

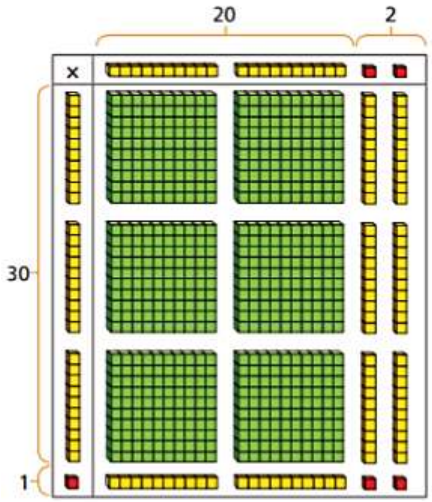
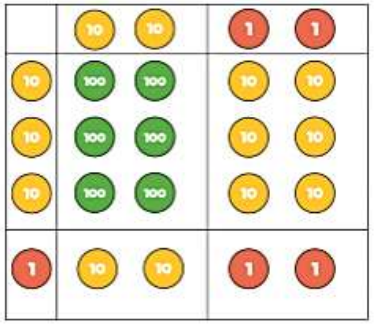
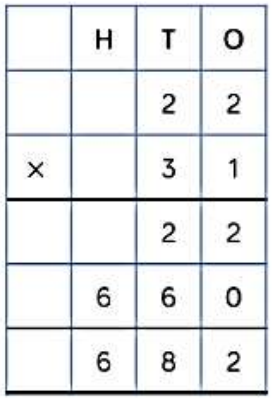
Strategy/NC Objective	Concrete	Pictorial	Abstract
Grid method recap before moving to column method.	See year 3	See year 3	See year 3
Column method - multiply two and three-digit by one-digit	245 x 4 = 980  Place value counters could also be used.	245 x 4 = 980  Pictorial representations of place value counters.	245 x 4 = 980 

Mental Strategies:

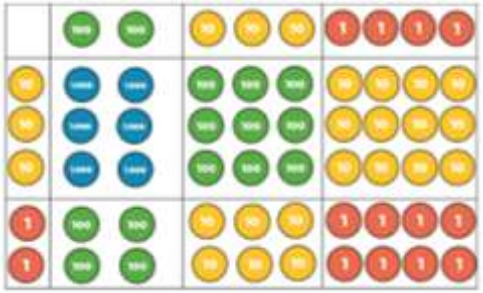
1. Know all times tables up to and including 12 x 12 (by the end of Year 4)
2. Recognise and use factor pairs (e.g. factor pairs for numbers up to and including 10)
3. Know that TU x 5 is TU x 10 then divide by 2 (e.g. 18 x 5 = (18 x 10) ÷ 2 = 90)
4. Know that TU x 9 is TU x 10 then subtract TU (e.g. 18 x 9 = (18 x 10) - 18 = 162).

Multiplication - Year 5

★ **words:** odd, even, how many times?, lots of, groups of, repeated addition, array, multiply, multiply by, estimate, inverse, commutative, product, column multiplication, grid method, repeated addition, array, row, column, double, **factor pairs**, **composite numbers**, **prime numbers**, **prime factors**, **square numbers**, **cube numbers**

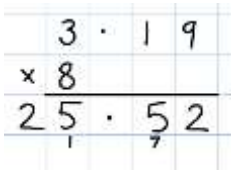
Strategy/NC Objective	Concrete	Pictorial	Abstract
Column method - multiply four-digit by one-digit	See year 4	See year 4	
Column method - multiply two-digit by two-digit	22 x 31 = 682  Place value counters could also be used.	22 x 31 = 682  Pictorial representations of place value counters.	22 x 31 = 682 

<table>
<tr><td colspan="4">Year 5 continued</td></tr>
<tr>
<td>Column method

- multiply three-digit by two-digit</td>
<td>See multiplying 2-digit by 2-digit</td>
<td>234 x 32 = 7,488
 
Pictorial representations of place value counters.</td>
<td>
<table>
<tr><th>Th</th><th>H</th><th>T</th><th>O</th></tr>
<tr><td></td><td>2</td><td>3</td><td>4</td></tr>
<tr><td>×</td><td></td><td>3</td><td>2</td></tr>
<tr><td></td><td>4</td><td>6</td><td>8</td></tr>
<tr><td>¹7</td><td>¹0</td><td>2</td><td>0</td></tr>
<tr><td>7</td><td>4</td><td>8</td><td>8</td></tr>
</table>
</td>
</tr>
<tr><td colspan="4">Mental Strategies:
1. Recognise and calculate factor pairs for any number
2. Use times table knowledge to derive multiples of any number
3. Establish whether a number is a prime number (up to 100) or a composite number (not prime) and recall prime numbers up to 19
4. To know what a square number is and recall all square numbers (up to and including 144)
5. To know what a cube number is and recall the first 5 cube numbers.</td></tr>
</table>

Multiplication - Year 6

words: odd, even, how many times?, lots of, groups of, repeated addition, array, multiply, multiply by, estimate, inverse, commutative, product, column multiplication, grid method, repeated addition, array, row, column, double, factor pairs, composite numbers, prime numbers, prime factors, square numbers, cube numbers, **order of operations**

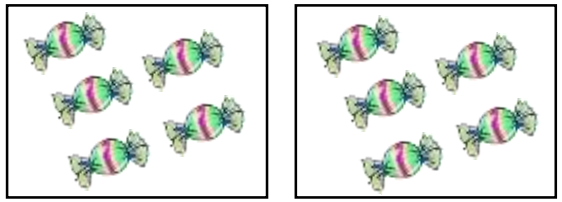
Strategy/NC Objective	Concrete	Pictorial	Abstract
Column method - multiply four-digit by two-digit	See year 5	See year 5	
Multiplying decimals up to 2 decimal places by a single digit			

Mental Strategies:

1. Use scaling to solve decimal number problems as whole number problems using the rule: 'the number of decimal digits in the question is the same as the number of decimal digits in the answer'
2. Identify common factors, common multiples and prime numbers
3. Use common factors to simplify fractions mentally
4. Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.

Division - Early Years

★ **words: halve, half, share, share equally, groups**

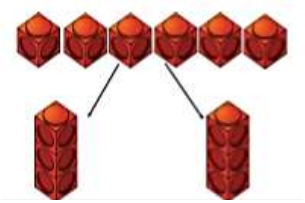
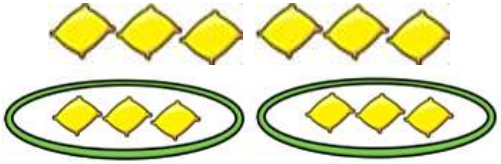
Early Learning Goal	Concrete	Pictorial	Abstract
Solve problems involving halving	Half of 8 is 4 	Half of 8 is 4 	What is half of 8?
Solve problems involving sharing	10 shared between 2 is … 	10 shared between 2 is … 	I have 10 sweets. I want to share them with my friend. How many sweets will we each have?

Mental Strategies:

1. Develop a mental image of the number system
2. Understand the value of a number.

Division - Year 1

words: halve, half, share, share equally, groups, **equal groups of**, **array**

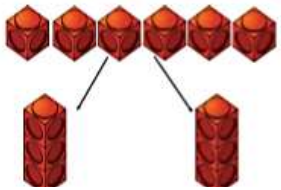
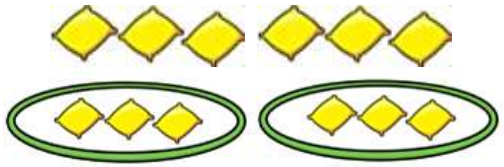
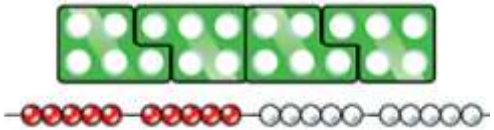
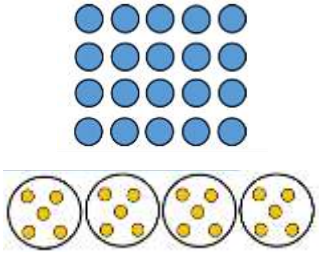
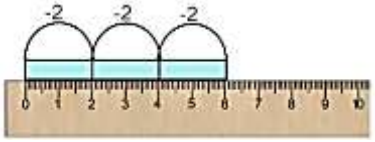
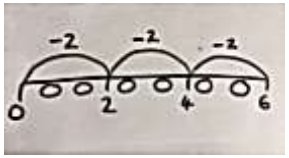
Strategy/NC Objective	Concrete	Pictorial	Abstract
Division as sharing	6 shared into 2 groups is … 	6 shared into 2 groups is … 	6 shared into 2 groups is 3

Mental Strategies:

1. Count forwards and backwards in multiples of 2s, 5s and 10s.

Division - Year 2

words: halve, half, share, share equally, groups, equal groups of, array, **inverse**, **divide**, **divide by**, **left**, **left over**

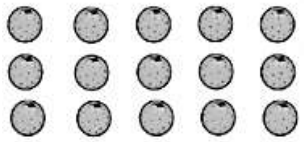
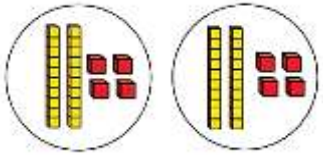
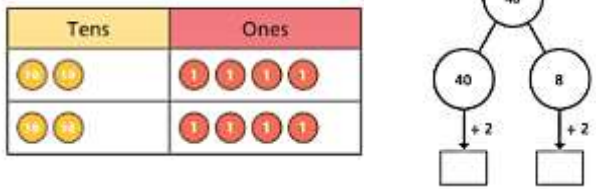
Strategy/NC Objective	Concrete	Pictorial	Abstract
Division as sharing	6 shared into 2 groups is … 6 ÷ 2 = 3 	6 shared into 2 groups is … 6 ÷ 2 = 3 	6 shared into 2 groups is 3 6 ÷ 2 = 3
Division as grouping	20 ÷ 5 = 4 	20 ÷ 5 = 4 	20 ÷ 5 = 4
Division with repeated subtraction	6 ÷ 2 = 3 	6 ÷ 2 = 3 	6 ÷ 2 = 3

Mental Strategies:

1. To know that division is the inverse of multiplication
2. Recall division facts for the 2, 5 and 10 times tables
3. Recall halves for even numbers up to and including 20.

Division - Year 3

★ **words:** halve, half, share, share equally, groups, equal groups of, **how many groups …?** array, divide, divide by, left, left over, **bus stop division**, inverse

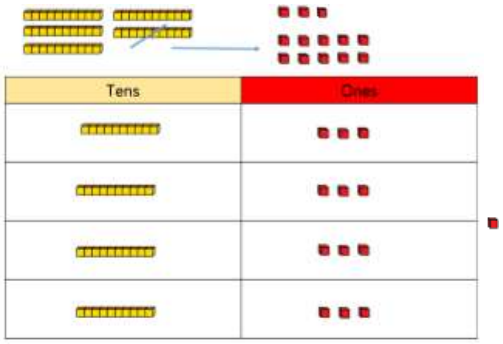
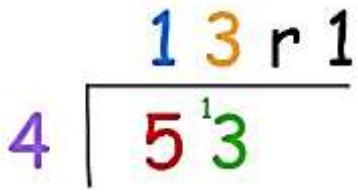
Strategy/NC Objective	Concrete	Pictorial	Abstract
Division with arrays	 15 ÷ 3 = 5 5 x 3 = 15 15 ÷ 5 = 3 3 x 5 = 15	 15 ÷ 3 = 5 5 x 3 = 15 15 ÷ 5 = 3 3 x 5 = 15	15 ÷ 3 = 5 5 x 3 = 15 15 ÷ 5 = 3 3 x 5 = 15
Bus stop method no remainders - divide two-digit by one-digit	48 ÷ 2 = 24 	48 ÷ 2 = 24 	48 ÷ 2 = 24 2 4 2 | 4 8
Bus stop method with exchanging - divide two-digit by one-digit	52 ÷ 4 = 13 	52 ÷ 4 = 13 	52 ÷ 4 = 13 1 3 4 | 5 ^{1}2

Mental Strategies:

1. Know the division facts from the 3, 4 and 8 times tables
2. Use knowledge of place value to calculate division (e.g. 14 ÷ 2 = 7, 140 ÷ 2 = 70, 1400 ÷ 2 = 700).

Division - Year 4

★ **words:** halve, half, share, share equally, groups, equal groups of, how many groups …? array, divide, **divisible**, divide by, left, left over, bus stop division, inverse, **remainder**, **exchange**, **factor, multiple**

Strategy/NC Objective	Concrete	Pictorial	Abstract
Bus stop method no remainders - divide two-digits by one-digit - divide three-digits by one-digit	See year 3	See year 3	See year 3
Bus stop method with remainders - divide two-digits by one-digit - divide three-digits by one-digit	53 ÷ 4 = 13 r 1  Place value counters could also be used.	53 ÷ 4 = 13 r 1  Pictorial representations of place value counters.	53 ÷ 4 = 

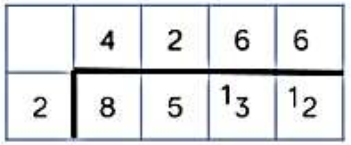
Mental Strategies:

1. Know all related division facts for all times tables up to 12 times table (by the end of Year 4).

Division - Year 5

★ **words:** halve, half, share, share equally, groups, equal groups of, how many groups …? array, divide, divisible, divide by, left, left over, bus stop division, inverse, remainder, exchange, factor, multiple **divisor**, **quotient**, **dividend**

quotient
divisor) dividend

Strategy/NC Objective	Concrete	Pictorial	Abstract
Bus stop method with remainders Divide three-digit by one-digit Divide four-digit by one-digit	See year 4	See year 4	8,532 ÷ 2 = 4,266 

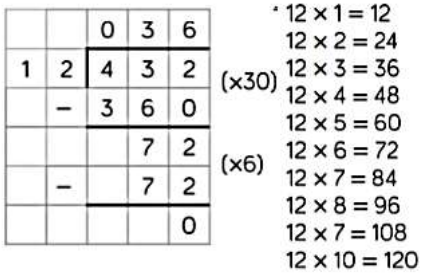
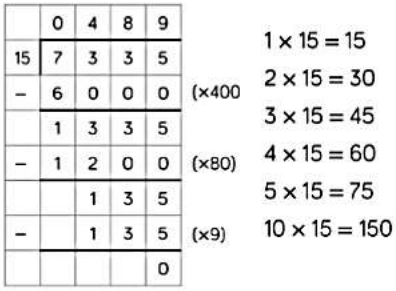
Mental Strategies:

1. Multiply and divide numbers mentally drawing upon known facts
2. Associate fractions with division.

Division - Year 6

words: halve, half, share, share equally, groups, equal groups of, how many groups …? array, divide, divisible, divide by, left, left over, bus stop division, **long division**, inverse, remainder, exchange, factor, multiple, divisor, quotient, dividend, **common factors**, **common multiples**

quotient
divisor) dividend

Strategy/NC Objective	Concrete	Pictorial	Abstract
Division involving decimals Divide multi-digits by two-digit	See year 4	See year 4	432 ÷ 12 = 36  7,335 ÷ 15 = 489 
Long division Divide multi-digits by two-digit	432 ÷ 12 = 36  12 × 1 = 12 12 × 2 = 24 12 × 3 = 36 12 × 4 = 48 12 × 5 = 60 12 × 6 = 72 12 × 7 = 84 12 × 8 = 96 12 × 7 = 108 12 × 10 = 120	7,335 ÷ 15 = 489  1 × 15 = 15 2 × 15 = 30 3 × 15 = 45 4 × 15 = 60 5 × 15 = 75 10 × 15 = 150	372 ÷ 15 = 24 r 12  1 × 15 = 15 2 × 15 = 30 3 × 15 = 45 4 × 15 = 60 5 × 15 = 75 10 × 15 = 150

Mental Strategies:

1. Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy
2. Calculate a fraction of an amount.