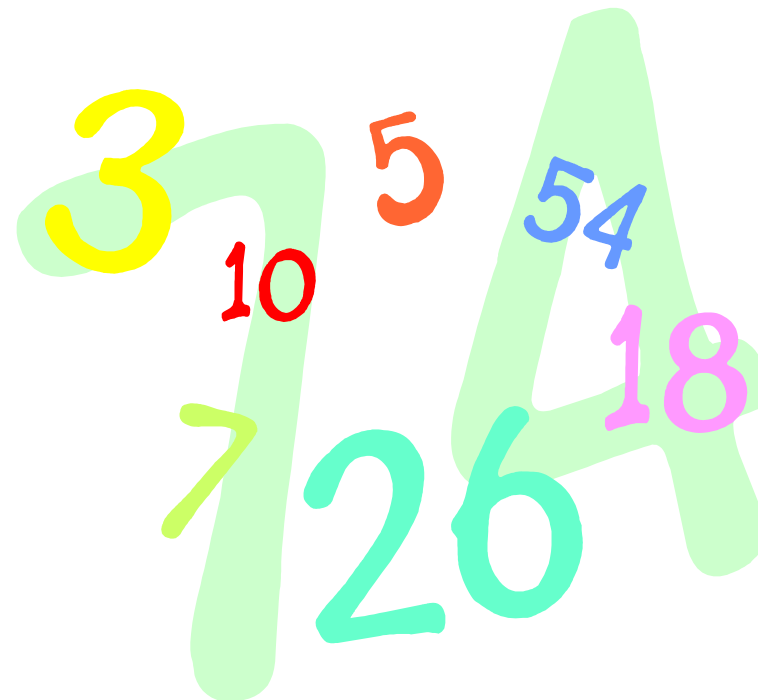




Corpus Christi Catholic Primary School

Calculation Policy

Autumn 2019





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Introduction

This calculation policy has been written to meet the requirements of the National Curriculum 2014 for the teaching and learning of mathematics, and is also designed to give pupils a consistent and smooth progression of learning in calculations throughout the school.

Children at Corpus Christi should be introduced to the processes of calculation through practical, oral and mental activities. As they begin to understand the underlying ideas, they should develop ways of recording to support their thinking and calculation methods, so that they develop both **conceptual understanding** and **fluency** in the fundamentals of mathematics. Whilst interpreting signs and symbols involved with calculation, orally in the first instance, children should use both concrete resources as well as pictorial representations as part of a **Concrete-Pictorial-Abstract – CPA - approach** to support their mental and written methods of calculation. As children's mental methods are strengthened and refined, they should begin to work more efficiently, which will support them with using succinct written calculation strategies as they are developed.

Aims of the policy

- To ensure that children at Corpus Christi can recall number facts with fluency, having developed conceptual understanding through being able to visualise key ideas.
- To ensure consistency and progression in our approach to calculation at Corpus Christi, through:
 - Having a consistent set of images, models and concrete materials throughout the school.
 - Using consistent vocabulary, e.g. 'regrouping', 'exchanging', 'ones'.
 - Having a clear development of written methods so the children are prepared appropriately for the next stage.
- To ensure that children at Corpus Christi develop efficient, reliable written methods of calculation that they can apply with confidence when undertaking calculations that they cannot carry out mentally.
- To ensure children's knowledge of written methods are underpinned by a conceptual understanding of the four operations.

How to Use this Policy








- Use the policy as the basis of your planning – plan your lessons in the context of the bigger picture of children's Maths learning.
- Refer to the previous year if the children are not showing conceptual understanding of a calculation or are making significant errors.
- Use the policy as a guide to which models, images and concrete resources you should be using to support conceptual understanding.
- Constantly assess the children's understanding against their year group expectations by encouraging them to explain each step of their calculations.

Mental calculation

The ability to calculate mentally forms the basis of all methods of calculation and has to be maintained. A good knowledge and 'feel' for numbers is the product of structured practice through progression in relevant practical maths experiences alongside visual representations. By the end of Year 6, children should be equipped with efficient mental and written calculation methods, which they use fluently. Decisions about when to progress should always be based on the **security of pupils' understanding** and their **readiness to move ahead to the next stage**. At whatever stage in their learning, and with whatever written method is being used, children's strategies must still be underpinned by a secure understanding and knowledge of number facts that can be recalled fluently with flexibility. Up to Year 3, the emphasis should be on children working mentally. Once written methods are introduced, mental skills should be kept up by continuing to develop and apply them to problems. It is important for children to look at a problem and decide which method to choose, e.g. mental calculation, pictures, jottings, structured recordings.

Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Making a record of calculation						
		Jottings to support mental strategies				
			Explaining a mental strategy			
				Developing written methods		

All mental calculation strategies need to be taught explicitly using a Concrete – Pictorial – Abstract (CPA) approach in every year group, for example, using decimals in Key Stage 2. The following ideas can be adjusted so that they are accessible to all children. The NCETM, 2015, states that, 'a pupil really understands a mathematical concept, idea or technique if he or she can represent it in a variety of ways.'

<p>Doubles: $8 + 8 = 16$</p>  <p>8 + 8 is connected to 8×2</p>	<p>Near doubles: $6 + 7 = 13$</p>  <p>6 + 7 is commutative with $7 + 6$</p>	<p>Number bonds: $7 + 3 = 10$</p> 	<p>Finding the difference: $10 - 6 = 4$</p>  <p>David has 10 sweets, whilst Chloe has six sweets. How many more does David have than Chloe?</p>
<p>Partitioning: $14 + 12 = 26$</p> 	<p>Bridging: $7 + 5 = 12$</p> <p>To begin: $7 + 3 = 10$ Then: $10 + 2 = 12$</p> 	<p>Adjusting: $16 + 9 = 25$</p> <p>To begin: $16 + 10 = 26$</p> <p>Then: $26 - 1 = 25$</p> 	<p>Reordering: $8 + 7 + 2 = 17$</p> <p>e.g. calculating numbers in a different order</p> <p>To begin: $8 + 2 = 10$ Then: $10 + 7 = 17$</p>




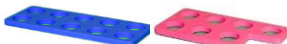

Counting, rapid recall, mental calculations – NC expectations

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Counting	-count to and across 100, forwards and backwards starting from 0. -count in multiples of twos, fives and tens.	-count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward.	-count from 0 in multiples of 4, 8, 50 and 100 -Count on 10 or 100 from any two-digit number. - Count up and down in tenths.	-count in multiples of 6, 7, 9, 25 and 1000 --count backwards through zero to include negative numbers. - Count up and down in tenths, hundredths and simple fractions	- Count forwards and backwards in steps of powers of 10 for any given number up to one million. -count forwards and backwards with positive and negative whole numbers. -Count forward and backwards in appropriate decimals and percentages.	- Count forwards and backwards in simple fractions, decimals and percentages.
Rapid Recall	-Rapid recall of all pairs of numbers totalling numbers up to 20. -Derive/recall doubles up to five and derive/recall halves up to ten.	-Recall addition and subtraction facts for all numbers to 20. -Derive/recall doubles up to ten and derive/recall halves up to twenty. -Recall & use multiplication facts for the 2X, 5X and 10X-tables.	- Connect pairs totalling ten to pairs of multiples of 10 totalling 100. (and subtractions) -Recall pairs of two-digit numbers with a total of 100 -Recall and use multiplication facts for the 2X, 3X, 4X, 5X, 8X and 10X tables.	-Use known facts and place value to derive new ones, i.e. 'If I know $8 + 3 = 11$, I also know $0.8 + 0.3 = 1.1$. -Sums and differences of pairs of multiples of 10, 100 or 1000. -Addition doubles of numbers to 100. Pairs of fractions totalling one. -Recall & use multiplication facts for all times-tables up to 12 X 12.	-Make links between known facts and addition pairs for fractions, percentages and decimals. -Doubles and halves of decimals, i.e. half of 5.6, double 3.4. -Sums and differences of decimals, i.e. $6.5 + 2.7$ -Recall & use multiplication facts for all times-tables up to 12 X 12.	-Using children's confident recalling of basic facts to 20/100 and deriving facts using place value, make links between decimals, fractions and percentages. -Recall & use multiplication facts for all times-tables up to 12 X 12.
Mental Maths		-add and subtract numbers using concrete objects, pictorial representations, and mentally, including: -a two-digit number and ones -a two-digit number and tens -two two-digit numbers -adding three one-digit numbers	- add and subtract numbers mentally, including: a three-digit number and ones; a three-digit number and tens; a three-digit number and hundreds	- 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	- add and subtract numbers mentally with increasingly large numbers - multiply and divide numbers mentally drawing upon known facts	

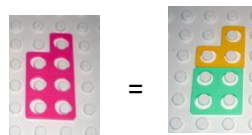
Early Years to Year 1: fundamental Concepts


There are fundamental concepts that it is important for children to develop an early understanding of as building blocks to future learning in maths, including those linked to calculation. A selection of the skills include:

- Ordinality – ‘the ordering of numbers in relation to one another’ – e.g. (1, 2, 3, 4, 5...)

- Cardinality – ‘understanding the value of different numbers’ – e.g. $7 =$  $17 =$  $14 =$ 

- Equality – ‘seven is the same total as four add three’ – e.g.

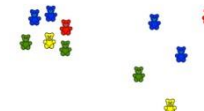


- Subitising – ‘instantly recognising the number of objects in a small group, without counting them’ – e.g.  → five


- One-to-one correspondence – e.g.



- Conservation of number – ‘recognising that a value of objects are the same, even if they are laid out differently’ – e.g.



- Concept of zero  $3 + 0 = 3$

- Counting on and back from any number – e.g. ‘five add three more totals eight’  ‘ten take away three totals seven’





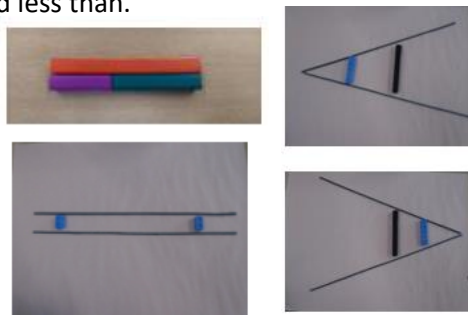
Equals

The equals symbol should also be expressed as meaning 'the same as'. Each side of the equals sign should be worth the same.

It is crucial that children develop a secure understanding of equality and the equals symbol from early on in the school and that this is reinforced throughout their Maths learning across the different calculations. Children need to experience equations where the equals sign is before and after the calculation, otherwise they get an inaccurate understanding of the symbol. A secure understanding of equality prepares the children for empty box questions, complex questions and, eventually, algebra in Year 6. Equality should be taught alongside inequality to support conceptual understanding.

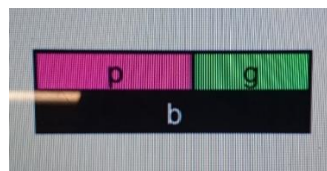
Concrete:

Children use physical equipment when learning about equality (also inequality), and also use related language, e.g. 'the same as,' 'more than' and 'less than.'



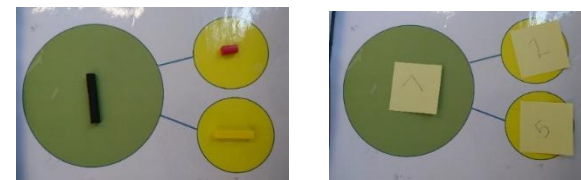
Pictorial:

Children use pictorial representations to show equality or values that are 'the same as,' whilst also verbalising their reasoning, e.g. 'pink and green are the same as black...'



Abstract:

Children use the part-whole model to record either written numerals or pictorial representations that highlight the concept of 'the same as...'



Number families

Children write the 8 different number sentences to match the picture.

$4 + 3 = 7$

$7 = 4 + 3$

$7 - 4 = 3$

$4 = 7 - 3$

$3 + 4 = 7$

$7 = 3 + 4$

$7 - 3 = 4$

$3 = 7 - 4$





+ Addition +

add, sum, plus, altogether, total, addition, more, and, equal to, equals, double, near double, most, count on, column, increase, vertical, horizontal, expanded, compact, digits, inverse, regroup, exchange, formal column method

ones, tens, hundreds, thousands, decimal point, decimal places, tenths, hundredths, thousandths

Key principles

- Inverse of subtraction
- Commutative i.e. $5 + 3 = 3 + 5$ [introduced explicitly in Yr 2 NC]
- Associative i.e. $5 + 3 + 7 = 5 + (3 + 7)$
- Calculations can be rearranged to add numbers in logical orders i.e. $4 + 13 = 17$ is the same as $13 + 4 = 17$

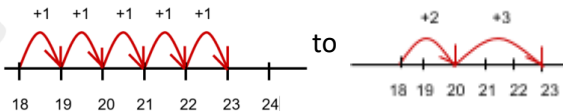
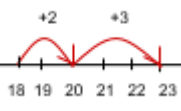
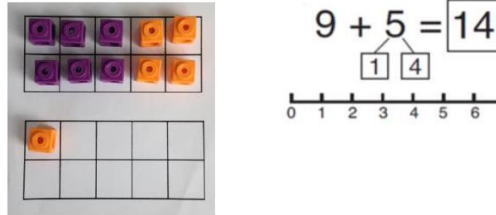
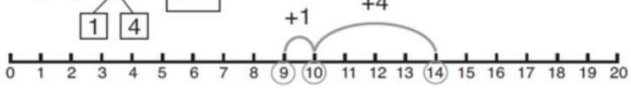
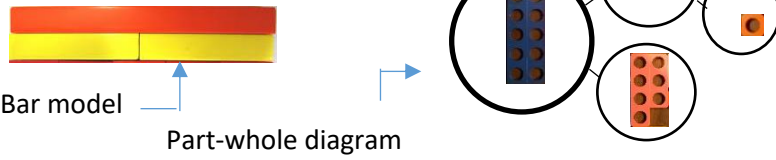
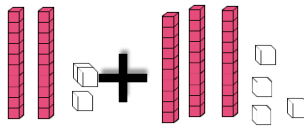
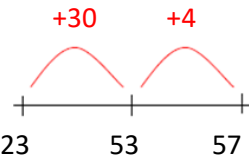

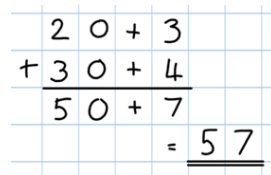
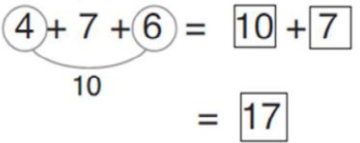


Year 1: add with numbers up to 20

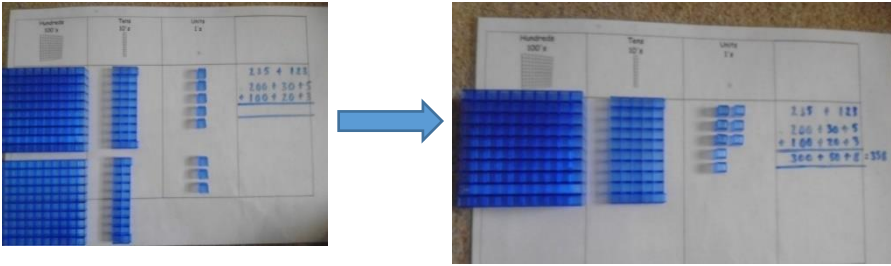
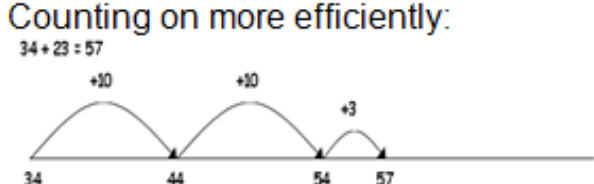
Notes	Appropriate models/ images to support conceptual understanding C-P	Written calculation A
<ul style="list-style-type: none"> - Teachers model how to line up counters/objects on a number track before counting on before moving onto a number-line. - Children are encouraged to start with the bigger number. - The concept of a whole / part-whole model is introduced. - Children should read and write the addition and equals sign within number sentences. - Children should interpret addition sentences and solve missing box problems. 	<div data-bbox="667 308 869 502"> </div> <div data-bbox="898 308 1182 502"> <p>Use cubes to add two numbers together as a group or in a bar.</p> </div> <div data-bbox="1198 347 1579 438"> </div> <div data-bbox="891 550 1025 571"> </div> <div data-bbox="678 587 1556 619"> <p>'Three plus two is the same as five' – double-sided counters / unifix cubes</p> </div> <div data-bbox="768 654 1153 686"> </div> <div data-bbox="840 694 1400 726"> <p>'Eight add two more makes ten' – bead strings</p> </div> <div data-bbox="660 794 922 877"> </div> <div data-bbox="694 917 840 949"> <p>Tens frame</p> </div> <div data-bbox="945 782 1258 858"> </div> <div data-bbox="940 917 1254 949"> <p>Bar model – Ants on a log</p> </div> <div data-bbox="1317 766 1545 901"> </div> <div data-bbox="1321 917 1568 949"> <p>Part-whole diagram</p> </div> <div data-bbox="660 981 1265 1061"> </div>	<p>Simple addition number sentences.</p> $3 + 2 = 5$ <p>Children should be exposed to a variety of number sentences. Part-whole diagram is key to moving into the abstract.</p> $2 + 1 = 3$ $3 = 1 + 2$ $3 = _ + 1$



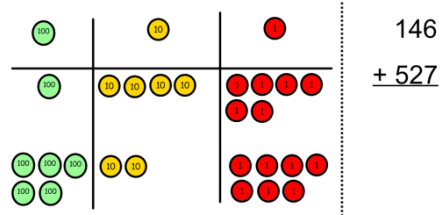
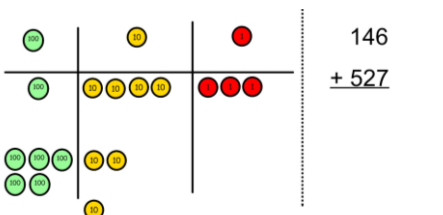
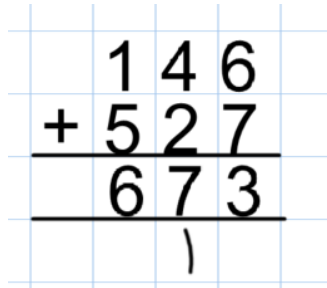
Year 2: add with 2-digit numbers and ones, 2-digit numbers and tens, pairs of 2-digit numbers and 3 single digit numbers.

Notes	Appropriate models/ images to support conceptual understanding C-P	Written calculation A
<ul style="list-style-type: none"> - Children begin to use number lines to support their own calculations, initially counting on from the largest number in ones before beginning to work more efficiently. - Children reorder 'strings' of numbers to apply their understanding of mental maths strategies, including doubles and number bonds, e.g. $6 + 7 + 4$ reordered to $6 + 4 = 10$ and then $10 + 7 = 17$. Jottings are used to help keep track of thinking. - Include lots of practice of regrouping to make ten. - The concept of a whole / part-whole model is reinforced and extended. - Adding 3 single-digit numbers - make 10 with 2 of the digits (if possible) then add on the third digit. 	<p>$18 + 5$</p>  <p>to</p>  <p>Regrouping to make ten - start with the bigger number and use the smaller number to make 10.</p>    <p>Bar model</p> <p>Part-whole diagram</p> <p>$23 + 34$:</p>  <p>Dienes</p>   <p>$4 + 7 + 6 = 17$ Put 4 and 6 together to make 10. Add on 7.</p>	<p>Expanded horizontal Method:</p>  <p>Examples should not include regrouping until the children are ready.</p> <p>Adding 3 single-digit numbers:</p>  <p>Combine the two numbers that make 10 and then add on the remainder.</p>

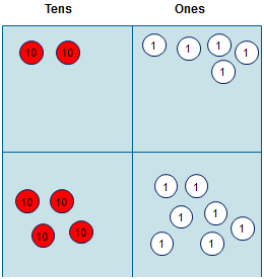
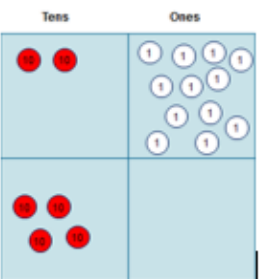
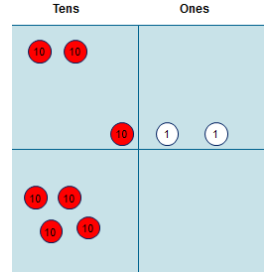
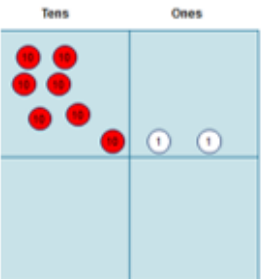
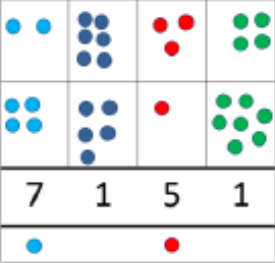

Year 3: add numbers with up to 3-digits

Notes	Appropriate models/ images to support conceptual understanding C-P	Written calculation A																																																																																													
<ul style="list-style-type: none"> - Recap the expanded horizontal method <ul style="list-style-type: none"> o Teachers model how numbers can be partitioned into tens and ones, including different ways, e.g. $36 = 30 + 6$ $36 = 20 + 10 + 6$ o Add numbers using structured apparatus to support understanding of place value. - Make connections between partitioning both numbers using structured apparatus and partition the second number only using a number line. - Introduce the expanded vertical method, adding the ones column first. - It is important that empty number lines are kept as well as using more formal written calculation methods. 	<div style="display: flex; justify-content: space-around; align-items: center;">  </div> <p>$24 + 15 =$ Add together the ones first then add the tens. Use Dienes first before moving on to place value counters.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><th>T</th><th>O</th></tr> <tr><td>■ ■ ■ ■ ■ ■ ■ ■</td><td>■ ■ ■ ■ ■</td></tr> <tr><td>■ ■ ■ ■ ■ ■ ■ ■</td><td>■ ■ ■ ■ ■</td></tr> <tr><td>■ ■ ■ ■ ■ ■ ■ ■</td><td>■ ■ ■ ■ ■</td></tr> </table> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>●</td><td>●</td></tr> <tr><td>● ● ● ● ●</td><td>● ● ● ● ●</td></tr> <tr><td>● ● ● ● ●</td><td>● ● ● ● ●</td></tr> <tr><td>●</td><td>● ● ● ● ●</td></tr> </table> </div> <p>Counting on more efficiently:</p> 	T	O	■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■	●	●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	● ● ● ● ●	●	● ● ● ● ●	<p>Expanded horizontal method:</p> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>2</td><td>2</td><td>5</td><td>+</td><td>1</td><td>2</td><td>3</td><td></td></tr> <tr><td>2</td><td>0</td><td>0</td><td>+</td><td>2</td><td>0</td><td>5</td><td></td></tr> <tr><td>1</td><td>0</td><td>0</td><td>+</td><td>2</td><td>0</td><td>3</td><td></td></tr> <tr style="border-top: 1px solid black;"><td>3</td><td>0</td><td>0</td><td>+</td><td>4</td><td>0</td><td>8</td><td>= 3 4 8</td></tr> </table> <p>Expanded vertical method:</p> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>2</td><td>3</td><td>6</td></tr> <tr><td>+</td><td>7</td><td>3</td></tr> <tr><td></td><td></td><td>9</td></tr> <tr><td></td><td>1</td><td>0</td><td>0</td></tr> <tr><td></td><td>2</td><td>0</td><td>0</td></tr> <tr style="border-top: 1px solid black;"><td></td><td>3</td><td>0</td><td>9</td></tr> </table> <p>Formal Column method:</p> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td></td><td>2</td><td>3</td><td>6</td></tr> <tr><td>+</td><td></td><td>7</td><td>3</td></tr> <tr style="border-top: 1px solid black;"><td></td><td></td><td>3</td><td>0</td></tr> <tr><td></td><td></td><td>3</td><td>0</td></tr> <tr><td></td><td></td><td></td><td>9</td></tr> <tr style="border-top: 1px solid black;"><td></td><td></td><td></td><td>1</td></tr> </table> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="border: 1px solid blue; border-radius: 50%; padding: 10px; background-color: #e0f0ff;"> The exchange digit should go below the line. </div> <div style="border: 1px solid yellow; border-radius: 50%; padding: 10px; background-color: #fff9c4;"> A line must be drawn after the calculation and after the solution with a pencil and ruler. </div> </div>	2	2	5	+	1	2	3		2	0	0	+	2	0	5		1	0	0	+	2	0	3		3	0	0	+	4	0	8	= 3 4 8	2	3	6	+	7	3			9		1	0	0		2	0	0		3	0	9		2	3	6	+		7	3			3	0			3	0				9				1
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Year 4: add up to 4 digits

Notes	Appropriate models/ images to support conceptual understanding C-P	Written calculation A
<p>- There remains an emphasis on the language of calculation and place value when carrying out column addition, e.g. ‘Forty plus seventy equals one-hundred and ten.’... ‘Seven add six equals thirteen.’ ...before recombining numbers. Teachers also model the language of: ‘Four tens add seven tens total eleven tens or 110.’</p> <p>- Teachers similarly advance to model the addition of two 3-digit numbers with the expectation that as children’s knowledge of place value is secured, they become ready to approach a formal compact column method.</p>	<p>Make both numbers on a place value grid.</p>  <p>Add up the ones and exchange 10 ones for one 10.</p>  <p>Add up the rest of the columns, exchanging the 10 counters from one column for the next place value column until every column has been added.</p> <p>This can also be done with dienes to help children clearly see that 10 ones equal 1 ten and 10 tens equal 100.</p>	<p>Ensure that children clearly show the exchange below the addition.</p> 


Year 5 & 6: add more than 4 digits and decimals

Notes	Appropriate models/ images to support conceptual understanding C-P	Written calculation A
<ul style="list-style-type: none"> - The concept of exchanging is reinforced through the use of concrete resources, e.g. dienes and Place Value counters. - Teachers model / children to explain: <ul style="list-style-type: none"> o "I have two tens and five ones, which need adding to four tens and seven ones." o "I add five ones to seven ones, which gives me twelve ones." o "I exchange ten of my twelve ones for a ten counter." o "I add my three tens and four tens to make seven tens." o "Altogether, I have seven tens and two ones." - Adding several numbers with different numbers of decimal places (including money and measures): <ul style="list-style-type: none"> o Tenths, hundredths and thousandths should be correctly aligned, with the decimal point lined up vertically including in the answer row. o Empty decimal places should be filled with zero to show the place value in each column. 	<div style="display: flex; flex-wrap: wrap; justify-content: space-around;"> <div style="text-align: center; margin: 5px;"> $\begin{array}{r} 25 \\ +47 \\ \hline \end{array}$  </div> <div style="text-align: center; margin: 5px;"> $\begin{array}{r} 25 \\ +47 \\ \hline 72 \end{array}$  </div> <div style="text-align: center; margin: 5px;"> $\begin{array}{r} 25 \\ +47 \\ \hline 72 \end{array}$  </div> <div style="text-align: center; margin: 5px;"> $\begin{array}{r} 25 \\ +47 \\ \hline 72 \end{array}$  </div> <div style="text-align: center; margin: 5px;">  </div> </div> <p style="text-align: center; margin-top: 10px;">Children can draw a pictoral representation of the columns and place value counters to further support their learning and understanding.</p>	<div style="text-align: center; margin-bottom: 20px;"> $\begin{array}{r} \text{£} 23.59 \\ + \text{£} 7.55 \\ \hline \text{£} 31.14 \end{array}$ </div> <div style="text-align: center; margin-bottom: 20px;"> $\begin{array}{r} 23481 \\ + 1362 \\ \hline 24843 \\ 1 \end{array}$ </div> <div style="text-align: center;"> $\begin{array}{r} 23.361 \\ 9.08 \\ 59.770 \\ + 1.300 \\ \hline 93.511 \\ 2 1 2 \end{array}$ </div>



Subtraction





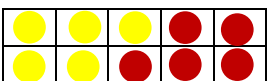

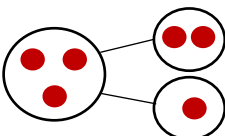
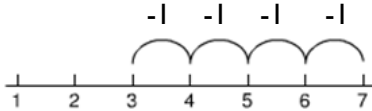
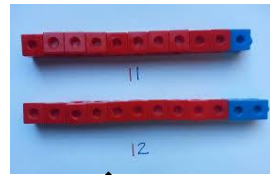
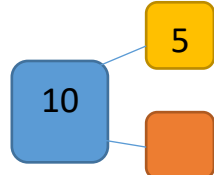
equal to, take, take away, less, minus, subtract, leaves, distance between, how many more, how many fewer / less than, most, least, count back, how many left, how much less is_?, difference, count on, strategy, regroup, exchange, decrease, inverse, expanded horizontal method, formal column method
ones, tens, hundreds, thousands, decimal point, decimal places, tenths, hundredths, thousandths

Key principles

- Inverse of addition.
- NOT commutative. $5-3$ is not the same as $3-5$ [explicitly taught in Yr 2 NC]
- NOT associative. $10-3-2$ is not the same as $10 - (3-2)$
- Three structures of subtraction:
 1. Reduction - Take away - Often mistaken for the only model which leads to misunderstandings.
 2. Partitioning - The first number (the minuend) is split into two parts (Subtrahend and difference).
 3. Comparative Difference

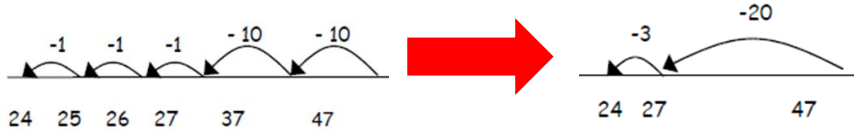
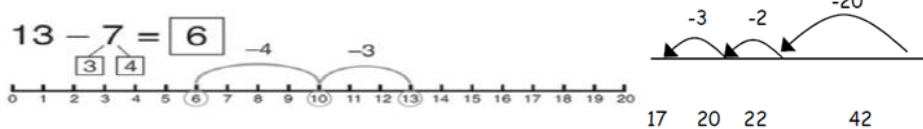
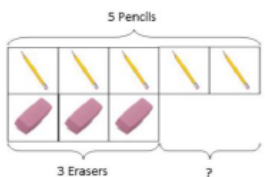

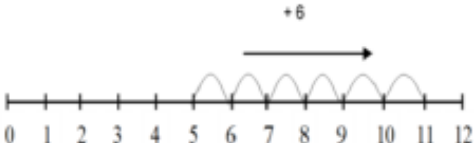
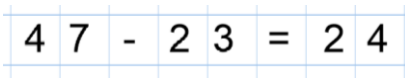


The diagram shows the equation $5 - 3 = 2$ on a light green background. The number 5 is red and labeled 'Minuend' with a red arrow. The number 3 is purple and labeled 'Subtrahend' with a purple arrow. The number 2 is blue and labeled 'Difference' with a blue arrow.

Year 1: subtract from numbers up to 20

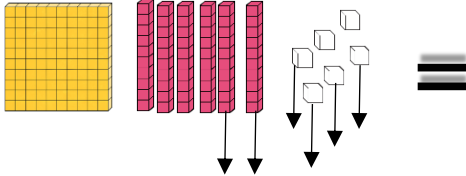
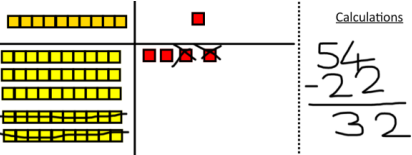
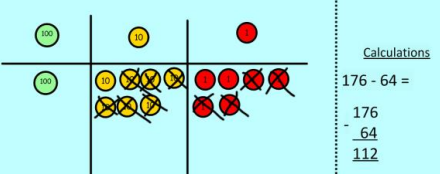
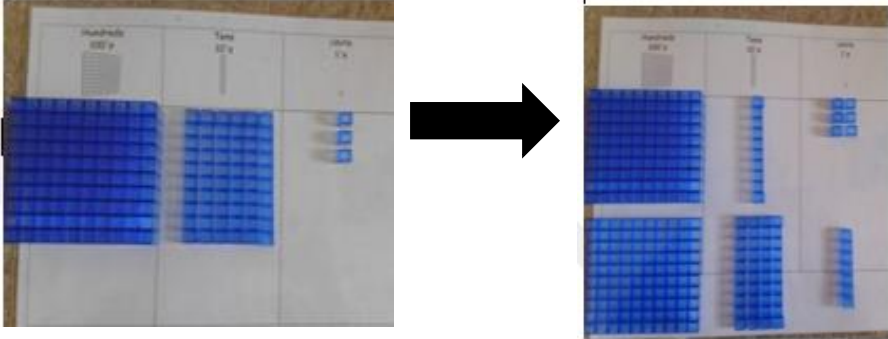
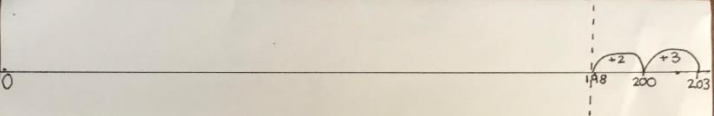
Notes	Appropriate models/ images to support conceptual understanding C-P	Written calculation A
<ul style="list-style-type: none"> - Children consolidate understanding of subtraction practically, showing subtraction on bead strings, using cubes etc. and in familiar contexts. - Teachers model how to remove counters/objects and count back on a number track. This is a precursor to use of a fully numbered number-line. - The concept of a whole / part-whole model is introduced. - Count back in ones on a number line to take away. - Ensure that children are exposed to all three structures of subtraction. 	<p>Use physical objects, counters, cubes etc to show how objects can be taken away.</p>    <p>'Five minus two totals three'</p>  <p>'Six take away two leaves four'</p>    <p>Tens frame Bar model – Ants on a log Part-whole diagram Use to find the difference</p>  <p>7 - 4 = 3</p>  <p>Use cubes to build towers or make bars to find the difference</p>	<p>Simple number sentences with the equals sign in different places.</p> $5 - 2 = 3$ $3 = 5 - 2$ <p>Put 13 in your head, count back 4. What number are you at? Use your fingers to help.</p> <p>Move to using numbers within the part whole model.</p> 

Year 2: subtract with 2-digit numbers and ones, 2-digit numbers and tens and pairs of 2-digit numbers.



Notes	Appropriate models/ images to support conceptual understanding C-P	Written calculation A
<ul style="list-style-type: none"> - Children begin to use number lines to support their own calculations, initially counting back in ones before beginning to work more efficiently. - Teachers model how to find the difference using various models and images. 	<p>Partition the second number and subtract it in tens and ones. $47 - 23 = 24$</p>  <p>Teaching children to bridge through ten can help them to become more efficient.</p>  <p>Use basic bar models with items to find the difference.</p>   <p>Comparing two sets to find the difference.</p>  <p>Count on to find the difference.</p>	 <p>How many do we take off to reach the next 10?</p> <p>Hannah has 23 sandwiches, Helen has 15 sandwiches. Find the difference between the number of sandwiches.</p>  

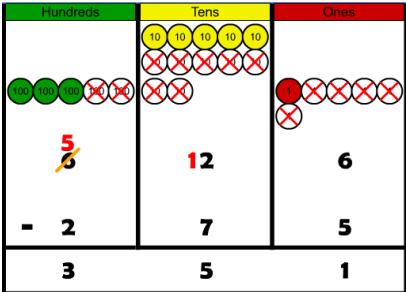
Year 3: subtract with up to 3 digit numbers

Notes	Appropriate models/ images to support conceptual understanding C-P	Written calculation A
<ul style="list-style-type: none"> - Column method without regrouping using Expanded Horizontal method. <ul style="list-style-type: none"> o Use dienes to make the bigger number then take the smaller number away o Draw dienes or place value counters alongside the written calculation - Expanded horizontal method with regrouping <ul style="list-style-type: none"> o Use dienes before moving onto Place Value Counters o Start with one exchange before moving onto 2 exchanges. - Finding the difference - Children should note that finding the difference is often the most efficient way of solving a subtraction problem when two numbers are close together. e.g. $61 - 59$ 	<p>Dienes</p>  <p>Images of dienes</p>  <p>Images of Place Value Counters</p>  <p>Exchanging with dienes</p>  <p>Finding the difference on a number line</p> 	<p>Expanded horizontal method without regrouping</p> $\begin{array}{r} 100 + 60 + 7 \\ - \quad \quad 20 + 4 \\ \hline 100 + 40 + 3 \end{array}$ <p>Expanded horizontal method with regrouping</p> $363 - 147 = 216$ $\begin{array}{r} 50 \quad 13 \\ 300 + \cancel{60} + \cancel{3} \\ - 100 + 40 + 7 \\ \hline 200 + 10 + 6 \end{array}$ <p>Formal Column method:</p> $\begin{array}{r} 167 \\ - 24 \\ \hline 143 \end{array}$ <div style="border: 1px solid black; border-radius: 50%; padding: 10px; width: fit-content; margin-left: auto; margin-right: auto;"> A line must be drawn after the calculation and after the solution with a pencil and ruler. </div>

Year 4: subtract with up to 4 digits

Notes	Appropriate models/ images to support conceptual understanding C-P	Written calculation A
<ul style="list-style-type: none"> - Formal Column Method with regrouping is reinforced using dienes and Place Value Counters - Show children how the concrete method links to the written method alongside your working. 	<p>Make the larger number with the place value counters</p> <p>Calculations</p> $\begin{array}{r} 234 \\ - 88 \\ \hline \end{array}$ <p>Start with the ones, can I take away 8 from 4 easily? I need to exchange one of my tens for ten ones.</p> <p>Calculations</p> $\begin{array}{r} 234 \\ - 88 \\ \hline \end{array}$ <p>Now I can subtract my ones.</p> <p>Calculations</p> $\begin{array}{r} 234 \\ - 88 \\ \hline \end{array}$ <p>Now look at the tens, can I take away 8 tens easily? I need to exchange one hundred for ten tens.</p> <p>Calculations</p> $\begin{array}{r} 234 \\ - 88 \\ \hline \end{array}$ <p>Now I can take away eight tens and complete my subtraction</p> <p>Calculations</p> $\begin{array}{r} 234 \\ - 88 \\ \hline 146 \end{array}$	<p>Expanded horizontal method with regrouping</p> <p>Children can start their formal written method by partitioning the number into clear place value columns.</p> $2754 - 1562 = 1192$ $2000 + 500 + 60 + 2 - 1000 + 500 + 60 + 2 = 1000 + 100 + 90 + 2$ <p>Formal Column method:</p> $\begin{array}{r} 2754 \\ - 1562 \\ \hline 1192 \end{array}$ <p>Exchanging should be clearly shown above the calculation so the children are clear about the numbers they are working with.</p>

Year 5 & 6: subtract up to more than 4 digits

Notes	Appropriate models/ images to support conceptual understanding C-P	Written calculation A												
<ul style="list-style-type: none"> - The formal column method is reinforced through the use of images, enabling children to show their understanding of what is happening during the exchanges. - Draw the counters onto a place value grid and show what you have taken away by crossing the counters out as well as clearly showing the exchanges you make. - Teacher Model / children should explain: <ul style="list-style-type: none"> o "I have six ones and I need to subtract 5 ones. This leaves me with 1 one." o "Now I have 2 tens and I need to subtract 7 tens. At the moment, I cannot subtract 7 tens from 2 tens so I must exchange one hundred to become 10 tens." o "I can now subtract 7 tens from 12 tens." o I now have 5 remaining hundreds. I take 2 hundreds away and am left with 3 hundreds." o I am now left with 3 hundreds, 5 tens and 1 one to make 351. - Empty decimal places to be filled with 0. 	<p>Place value grid with drawn counters</p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="background-color: #c8e6c9;">Hundreds</th> <th style="background-color: #fff9c4;">Tens</th> <th style="background-color: #ffcdd2;">Ones</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">5 5</td> <td style="text-align: center;">7 7</td> <td style="text-align: center;">6 6</td> </tr> <tr> <td style="text-align: center;">- 2</td> <td style="text-align: center;">7</td> <td style="text-align: center;">5</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">5</td> <td style="text-align: center;">1</td> </tr> </tbody> </table>	Hundreds	Tens	Ones	5 5	7 7	6 6	- 2	7	5	3	5	1	<p>Formal Column Method with bigger numbers and in a variety of contexts.</p> $ \begin{array}{r} \overset{2}{\cancel{3}} \overset{1}{\cancel{0}} \overset{4}{\cancel{8}} \overset{6}{\cancel{6}} \\ - \quad 2128 \\ \hline 28928 \end{array} $ <p>Including decimals</p> $ \begin{array}{r} \overset{6}{\cancel{7}} \overset{1}{\cancel{6}} \overset{8}{\cancel{9}} \cdot \overset{0}{\cancel{0}} \\ - \quad 372 \cdot 5 \\ \hline 6796 \cdot 5 \end{array} $ <p>Use the column method to subtract money and measures</p> $ \begin{array}{r} \overset{1}{\cancel{4}} \overset{1}{\cancel{5}} \cdot \overset{3}{\cancel{4}} \overset{1}{\cancel{1}} \overset{9}{\cancel{9}} \text{ kg} \\ - \quad 36 \cdot 08 \overset{0}{\cancel{0}} \text{ kg} \\ \hline 69 \cdot 339 \text{ kg} \end{array} $
Hundreds	Tens	Ones												
5 5	7 7	6 6												
- 2	7	5												
3	5	1												



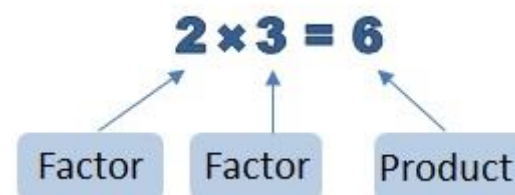
✖ Multiplication ✖

groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, column, row, commutative, sets of, equal groups, times as big as, once, twice, three times... partition, grid method, multiple, product, value, inverse

ones, tens, hundreds, thousands, decimal point, decimal places, tenths, hundredths, thousandths

Key principles

- Multiplication is repeated addition
- Inverse of division
- Commutative i.e. 5×3 is the same as 3×5
- Associative i.e. $2 \times 3 \times 5$ is the same as $2 \times (3 \times 5)$



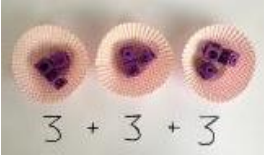
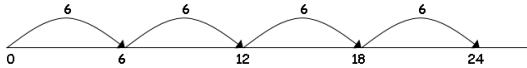




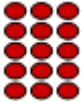
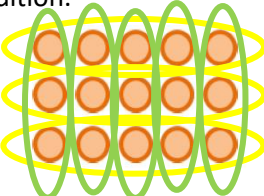
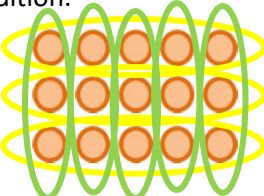


Year 1: carry out one step problems involving multiplication with teacher support

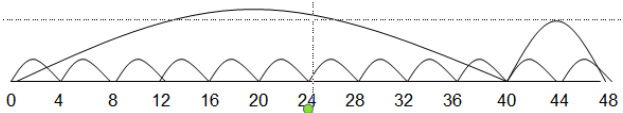
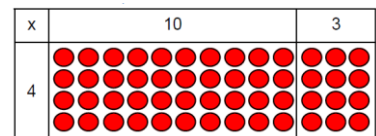
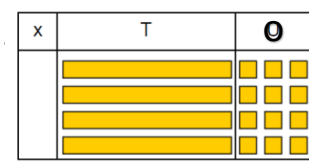
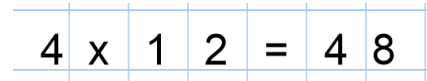
Notes	Appropriate models/ images to support conceptual understanding C-P	Written calculation A
<ul style="list-style-type: none"> - Children develop early conceptual understanding of multiplication / grouping through a variety of objects and pictorial representations. - Children to experience counting equal groups of objects. - Present practical problem solving activities counting equal sets or groups. - Continue to emphasise doubling using a variety of objects. - Begin to recognise arrays e.g. egg boxes. 	<p>double 4 is 8</p> <p>Double 4 is 8</p> <p>10 lots of 2 legs = 20</p>	<p>Double 2 = 4 2 lots of 2 is the same as 4 $2+2 = 4$</p> <p>Double 5 = 10 2 lots of 5 is the same as 10 $5 + 5 = 10$</p> <p>Start very slowly to introduce the 'x' sign in relation to doubling.</p> <p>Double 4 = 8 2 lots of 4 = 8 $2 \times 4 = 8$</p>



Year 2: multiply using arrays and repeated addition (at least using 2s, 5s, 10s)

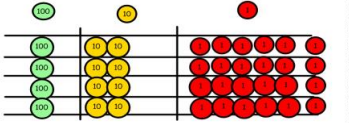
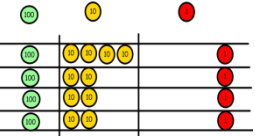
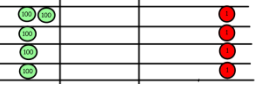
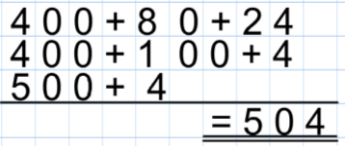
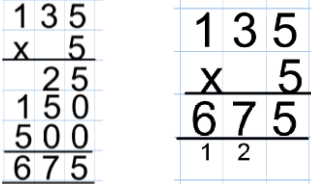
Notes	Appropriate models/ images to support conceptual understanding C-P	Written calculation A
<p>- Understanding multiplication as repeated addition</p> <ul style="list-style-type: none"> ○ Use different objects to add equal groups (building on from Year 1) <p>- Use arrays to support children to understand the law of commutativity.</p> <ul style="list-style-type: none"> ○ Draw arrays in different rotations to highlight this. ○ Children to create arrays using counters to represent multiplication statements. 	 $3 + 3 + 3$   <p>'Six multiplied by four'</p> <p>There are 3 plates. Each plate has 2 star biscuits on. How many biscuits are there?</p>  <p>2 add 2 add 2 equals 6</p> <p>Arrays:</p>   5×3  3×5 <p>and</p>  <p>There are 24 counters in 4 rows of 6. $4 \times 6 = 24$</p>	$3+3+3 = 9$ 3 lots of 3 = 9 $3 \times 3 = 9$ $6 + 6 + 6 + 6 = 24$ Six multiplied by 4 equals 24 $6 \times 4 = 24$ $2 + 2 + 2 = 6$ 3 lots of 2 = 6 $3 \times 2 = 6$ Use an array to write multiplication sentences and reinforce repeated addition.  $5 + 5 + 5 = 15$ $3 + 3 + 3 + 3 + 3 = 15$ $5 \times 3 = 15$ $3 \times 5 = 15$


Year 3: multiply two-digit numbers by one-digit numbers

Notes	Appropriate models/ images to support conceptual understanding C- P	Written calculation A						
<ul style="list-style-type: none"> - Continue to relate multiplication to repeated addition and arrays. - Show the link with arrays to first introduce the grid method. - Move on to using Dienes to move towards a more compact method. - Move from the pictorial grid method to writing the numbers then adding clearly under the grid. 	<p>Children use an empty number line to group efficiently:</p> <p>$4 \times 12 = 48$</p> <p>$4 \times 10 = 40$ $4 \times 2 = 8$</p>   <p>4 rows of 10 4 rows of 2</p> 	 <table border="1" data-bbox="1612 702 1948 805"> <tr> <td>x</td> <td>30</td> <td>5</td> </tr> <tr> <td>7</td> <td>210</td> <td>35</td> </tr> </table> <p>$210 + 35 = 245$</p>	x	30	5	7	210	35
x	30	5						
7	210	35						



Year 4: multiply 2 and 3 digit numbers by a single digit (including all multiplication tables to 12)

Notes	Appropriate models/ images to support conceptual understanding C-P	Written calculation A																
<ul style="list-style-type: none"> - Continue to use the grid method using dienes. - Move on to place value counters to show how we are finding groups of a number. 	<p>$114 \times 2 = 228$</p> <table border="1" data-bbox="831 320 1503 628"> <tr> <td>X</td> <td>100</td> <td>10</td> <td>4</td> </tr> <tr> <td>2</td> <td></td> <td></td> <td></td> </tr> </table> <p>$4 \times 126 =$ We are multiplying by 4 so we need 4 rows. Fill each row with 126. Then start adding the columns:</p>  <p>Calculations 4×126</p> <p>4 hundreds + 8 tens + 24 ones</p>  <p>4 hundreds + 10 tens + 4 ones</p>  <p>5 hundreds + 4 ones = 504</p> <div data-bbox="1158 1086 1554 1217" style="border: 1px solid black; padding: 5px; margin-top: 20px;"> Children to start drawing their own place value counters on a grid method. </div>	X	100	10	4	2				<p>$114 \times 2 =$ $100 \times 2 = 200$ $10 \times 2 = 20$ $4 \times 2 = 8$ <hr/>$= 228$</p>  <p>$400 + 80 + 24$ $400 + 100 + 4$ $500 + 4$ <hr/>$= 504$</p> <p>$20 \times 3 = 60$ $4 \times 3 = 12$ $60 + 12 = 72$</p> <p>$136 \times 5 = 680$</p> <table border="1" data-bbox="1615 1094 1984 1158"> <tr> <td>X</td> <td>100</td> <td>30</td> <td>6</td> </tr> <tr> <td>5</td> <td>500</td> <td>150</td> <td>30</td> </tr> </table> 	X	100	30	6	5	500	150	30
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2																		
X	100	30	6															
5	500	150	30															

Year 5: multiply up to 4 digits by 1 or 2 digits

Year 6: multiply decimals with up to 2 decimal points



Notes	Appropriate models/ images to support conceptual understanding C-P	Written calculation A																																																																													
<p>- Introduce column multiplication:</p> <ul style="list-style-type: none"> ○ Start by comparing grid method calculation to short multiplication when multiplying by a single digit number. ○ Compare the grid method to long multiplication by multiplying by a two-digit number. 	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <table border="1" style="border-collapse: collapse; width: 150px; height: 150px;"> <tr> <td></td> <td style="text-align: center;">10</td> <td style="text-align: center;">8</td> </tr> <tr> <td style="text-align: center;">10</td> <td style="text-align: center;">100</td> <td style="text-align: center;">80</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">30</td> <td style="text-align: center;">24</td> </tr> </table> <p>↓</p> <table style="width: 100%;"> <tr> <td style="text-align: center;">18</td> <td style="text-align: center;">18</td> </tr> <tr> <td style="text-align: center;">x 13</td> <td style="text-align: center;">x 13</td> </tr> <tr> <td style="text-align: center;">24</td> <td style="text-align: center;">54</td> </tr> <tr> <td style="text-align: center;">30</td> <td style="text-align: center;">180</td> </tr> <tr> <td style="text-align: center;">80</td> <td style="text-align: center;">180</td> </tr> <tr> <td style="text-align: center;">100</td> <td style="text-align: center;">180</td> </tr> <tr> <td style="text-align: center;">234</td> <td style="text-align: center;">234</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> </tr> </table> </div> <div style="text-align: center;"> <table border="1" style="border-collapse: collapse; width: 150px; height: 100px;"> <tr> <td>X</td> <td>1000</td> <td>300</td> <td>40</td> <td>2</td> </tr> <tr> <td>10</td> <td>10000</td> <td>3000</td> <td>400</td> <td>20</td> </tr> <tr> <td>8</td> <td>8000</td> <td>2400</td> <td>320</td> <td>16</td> </tr> </table> <p>↓</p> <table style="width: 100%;"> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">1</td> </tr> <tr> <td style="text-align: center;">1342</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">x 18</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">13420</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">10736</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">24156</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">1</td> <td></td> <td></td> </tr> </table> </div> </div>		10	8	10	100	80	3	30	24	18	18	x 13	x 13	24	54	30	180	80	180	100	180	234	234	1	1	X	1000	300	40	2	10	10000	3000	400	20	8	8000	2400	320	16	2	3	1	1342			x 18			13420			10736			24156			1			<table border="1" style="border-collapse: collapse; width: 150px; height: 150px;"> <tr> <td></td> <td style="text-align: center;">3</td> <td style="text-align: center;">1</td> <td style="text-align: center;">9</td> </tr> <tr> <td style="text-align: center;">x 8</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">25</td> <td style="text-align: center;">5</td> <td style="text-align: center;">2</td> <td></td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">7</td> <td></td> <td></td> </tr> </table>		3	1	9	x 8				25	5	2		1	7		
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share, share equally, one each, two each..., group, groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, inverse, short division, remainder, multiple, divisible by, factor, quotient, prime number, prime factors, composite number (non-prime), common factor ones, tens, hundreds, thousands, decimal point, decimal places, tenths, hundredths, thousandths

Key principles

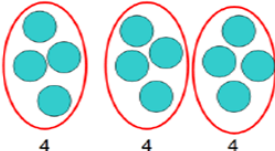
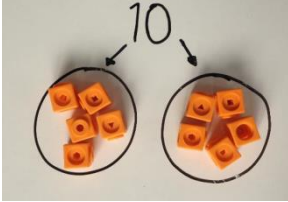
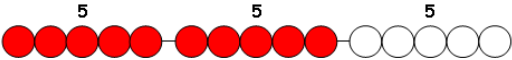
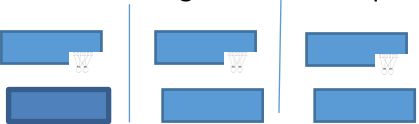
- Division is repeated subtraction
- Division is sharing equally
- Inverse of multiplication
- NOT commutative i.e. $15 \div 3$ is not the same as $3 \div 15$
- NOT associative i.e. $30 \div (5 \div 2)$ is not the same as $(30 \div 5) \div 2$

Diagram illustrating the division equation $10 \div 4 = 2 \text{ r } 2$. The components are labeled as follows:

- Dividend:** 10 (red)
- Divisor:** 4 (purple)
- Quotient:** 2 (blue)
- Remainder:** 2 (green)

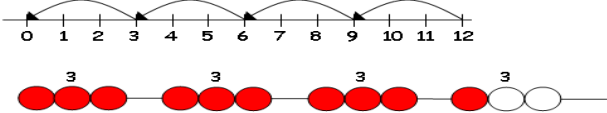
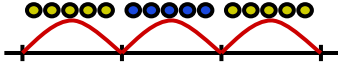
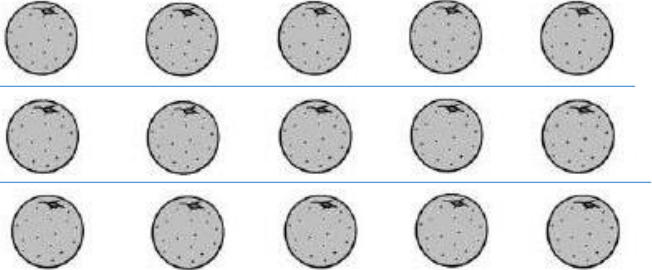



Year 1: carry out one step problems involving division with teacher support

Notes	Appropriate models/ images to support conceptual understanding C-P	Written calculation A
<ul style="list-style-type: none"> - Developing early conceptual understanding of division as grouping and sharing using objects, pictorial representations and arrays. - Introduce division problems in familiar contexts. E.g. "Two children share six pencils between them". - Relate to halving and quartering. 	 <p>12 shared between 3 is 4</p>   <p>"Six children are asked to get into three equal groups"</p> 	<p>Half of 10 = 5 10 can be grouped into two equal groups of 5.</p> <p>If you share 6 sweets equally between 3 people they get 2 sweets each.</p> <p>Start very slowly to introduce the division sign.</p>

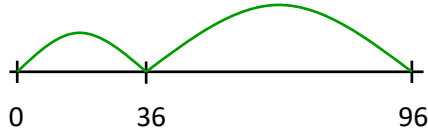

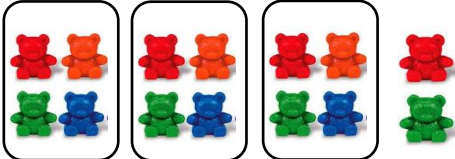
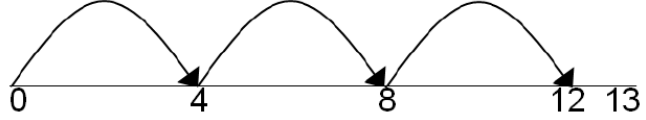



Year 2: divide by grouping and sharing (at least using 2s, 5s, 10s)

Notes	Appropriate models/ images to support conceptual understanding C-P	Written calculation A
<ul style="list-style-type: none"> - Understanding division as repeated subtraction: <ul style="list-style-type: none"> o Investigate division as repeated subtraction. o Through teacher modelling, children need to know that division is not commutative. - Continue to emphasise the language of 'grouping' and 'sharing' and discuss the difference. - Draw an array and use lines to split the array into groups to make multiplication and division sentences. 	<p>Number lines:</p>   <p>Arrays</p>  <p>Early Bar Model using Cuisenaire Rods</p> 	<p>$12 \div 3 = 4$ $12 - 3 - 3 - 3 - 3 = 0$ 12 can be grouped into 4 groups of 3.</p> <p>$15 \div 5 = 3$ You can take away 5 from 15 three times.</p> <p>Find the inverse of multiplication and division sentences by creating four linking number sentences.</p> <p>$3 \times 5 = 15$ $5 \times 3 = 15$ $15 \div 5 = 3$ $15 \div 3 = 5$</p> <p>$8 \div 4 = 2$ 4 lots of 2 = 8</p>

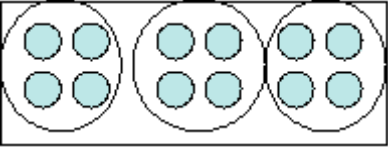
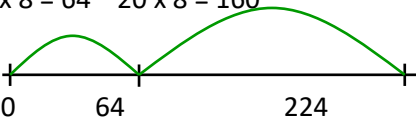
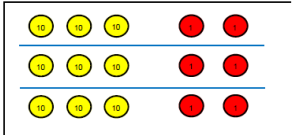
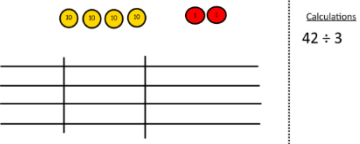
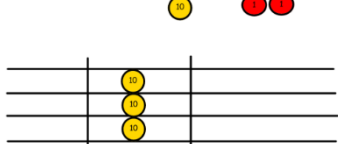
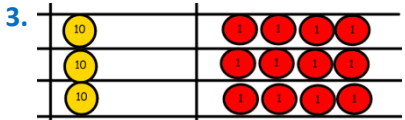
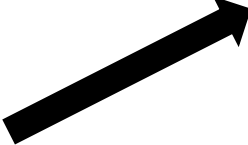
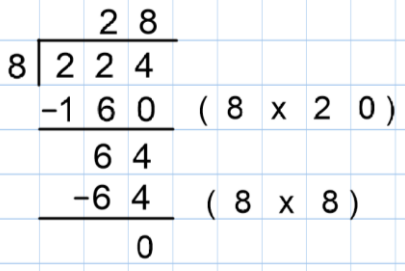
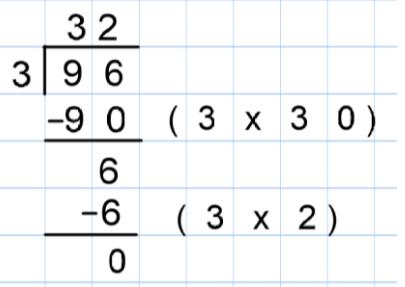
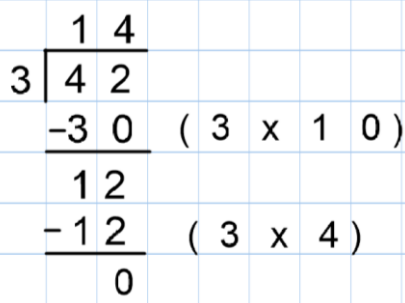


Year 3: Divide 2-digit numbers by a single digit

Notes	Appropriate models/ images to support conceptual understanding C-P	Written calculation A
<ul style="list-style-type: none"> - Children to use the chunking method to divide 2 digit numbers. - Children use an empty number line to chunk efficiently. - Conceptual understanding can be provided through use of a bead string to highlight the chunks. - Begin to teach the concept of remainders by dividing objects between groups and seeing how much is left over. - Jump forward in equal jumps on a number line then see how many more you need to jump to find a remainder. - Draw dots and group them to divide an amount and clearly show a remainder. 	<p>$96 \div 6 = 16$</p> <p>$6 \times 6 = 36$ $10 \times 6 = 60$</p>   <p>$14 \div 3 =$</p>   	<p>$96 \div 6 = 16$</p> <p>$6 \times 6 = 36$ $10 \times 6 = 60$ $6 + 10$ lots of 6 = 16</p> <p>Complete written divisions and show the remainder using r.</p> <p>$14 \div 3 = 4 \text{ r } 2$</p> <p>$13 \div 3 = 4 \text{ r } 1$</p> <p>$14 \div 4 = 3 \text{ r } 2$</p>



Year 4: Divide up to 3-digit numbers by a single digit

Notes	Appropriate models/ images to support conceptual understanding C-P	Written calculation A
<ul style="list-style-type: none"> Students can continue to use drawn diagrams with dots or circles to help them divide numbers into equal groups. Encourage them to move towards counting in multiples to divide more efficiently. Continue to use chunking to divide, using number lines to support understanding. Begin to introduce the bus stop method using place value counters <ol style="list-style-type: none"> Start with the biggest place value, we are sharing 40 into three groups. We can put 1 ten in each group and we have 1 ten left over. We exchange this ten for ten ones and then share the ones equally among the groups. We look how much in 1 group so the answer is 14. 	 <p>$224 \div 8 = 28$</p> <p>$8 \times 8 = 64 \quad 20 \times 8 = 160$</p>   <div style="display: flex; justify-content: space-around;"> <div data-bbox="678 965 1070 1181"> <p>1.</p>  <p>Calculations $42 \div 3$</p> </div> <div data-bbox="1081 965 1456 1181"> <p>2.</p>  </div> </div> <div data-bbox="678 1189 1120 1332"> <p>3.</p>  </div>	  $\begin{array}{r} 28 \\ 8 \overline{) 224} \\ \underline{-160} \quad (8 \times 20) \\ 64 \\ \underline{-64} \quad (8 \times 8) \\ 0 \end{array}$  $\begin{array}{r} 32 \\ 3 \overline{) 96} \\ \underline{-90} \quad (3 \times 30) \\ 6 \\ \underline{-6} \quad (3 \times 2) \\ 0 \end{array}$  $\begin{array}{r} 14 \\ 3 \overline{) 42} \\ \underline{-30} \quad (3 \times 10) \\ 12 \\ \underline{-12} \quad (3 \times 4) \\ 0 \end{array}$

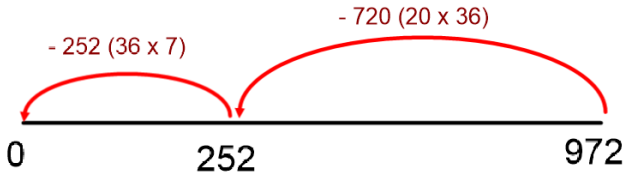
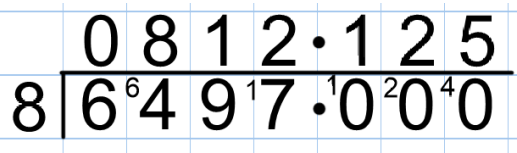


Year 5: divide up to 4 digit numbers by a one digit number, interpret remainders, and divide by powers of ten.

Notes	Appropriate models/ images to support conceptual understanding C-P	Written calculation A
<ul style="list-style-type: none"> - By this stage, there is a statutory requirement that children can use a formal written calculation method, such as long division. - Use place value counters to divide using the bus stop method alongside. - Short division may begin to be taught alongside long division, but still with use of visual representations. - Start with division that requires no exchanging or remainders, then build it up slowly. - When the answer for the first column is zero ($1 \div 5$, as in example), children could initially write a zero above to acknowledge its place. - Division needs to have a real life problem solving context, where pupils consider the meaning of the remainder and how to express it, ie. as a fraction, a decimal, or as a rounded number or value, depending upon the context of the problem. 	<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> $\begin{array}{r} 23 \\ 6 \overline{) 138} \end{array}$ </div> <div> </div> </div> <p> <i>'How many groups of six one-hundreds are there in one-hundred?'</i> <i>'How many groups of six tens are there in thirteen tens?'</i> <i>'How many groups of six ones are there in eighteen?'</i> </p>	<p>Short division with no exchanging</p> $\begin{array}{r} 32 \\ 3 \overline{) 96} \end{array}$ <p>Short division with exchanging</p> $\begin{array}{r} 037 \\ 5 \overline{) 185} \end{array}$ <p>Short division with exchanging and remainders</p> $\begin{array}{r} 0663 \text{ r } 5 \\ 8 \overline{) 5309} \end{array}$ <p><i>The answer to $5309 \div 8$ could be expressed as 663 and five eighths, 663 r 5, as a decimal, or rounded as appropriate to the problem involved.</i></p>



Year 6: divide 4 digit numbers by 2 digit numbers, including decimals.

Notes	Appropriate models/ images to support conceptual understanding C-P	Written calculation A
<ul style="list-style-type: none"> - Continue to give division problems real life contexts to support the children in interpreting remainders. - Introduce long division by chunking for dividing by 2 digits. - Teach pupils to write a “useful list” first at the side that will help them decide what chunks to use, e.g.: <ul style="list-style-type: none"> ○ $36 \times 1 = 36$ ○ $36 \times 2 = 72$ ○ $36 \times 10 = 360$ - Introduce the method in a simple way by limiting the choice of chunks to: Can we use 10 lots? Can we use 100 lots? As children become confident with the process, encourage more efficient chunks to get to the answer more quickly (e.g. $20x$, $5x$), and expand on their “useful” lists. 	<p>Empty number lines will continue to support the children’s conceptual understanding of long division.</p> 	<p>Short division with decimals</p>  <p>Long division with chunking</p> 