

Woodhouse Primary School's

# **WRITTEN CALCULATIONS POLICY**



**September 2023**

# **Contents:**

1. Rationale
2. Addition
3. Subtraction
4. Multiplication
5. Division

# Rationale

This booklet has been written to ensure that clear, coherent methods of calculation are used that have a clear progression as children move through school. It shows the agreed written calculations and methods that are taught at Woodhouse Primary School and that children are also encouraged to use when completing calculations as part of their homework.

Each operation has its own section, starting with addition and subtraction and moving through to multiplication and division. The practical methods used in Reception are shown first followed by the different methods introduced across Key Stage 1 and Key Stage 2 broken down by year group.

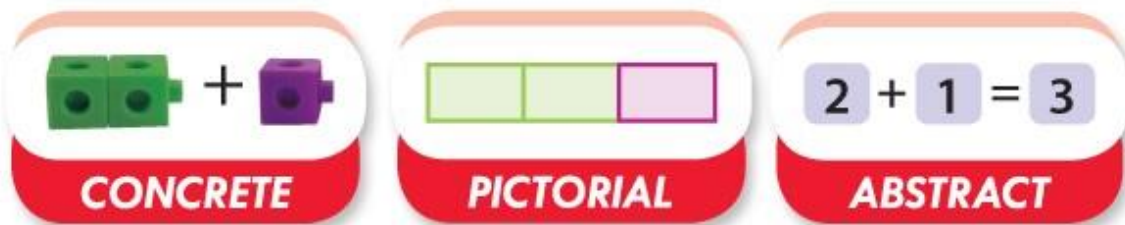
Although the year group in which new methods are introduced has been identified, staff will choose the strategy most suited to the groups of children in their cohort. They should use the agreed methods from year groups below or above their own to aid understanding or extend able learners.

The strategies shown in this policy focus on how each year group teaches a skill through using concrete equipment and pictorial representations to develop children's understanding of the methods before moving on to formal abstract methods of calculation.

*Concrete:* using manipulatives, objects or tools that the child can handle

*Pictorial:* using drawings, diagrams or jottings as a method to reach an answer (including bar models) by creating a physical representation of their mental image

*Abstract:* using numbers and symbols to represent calculations



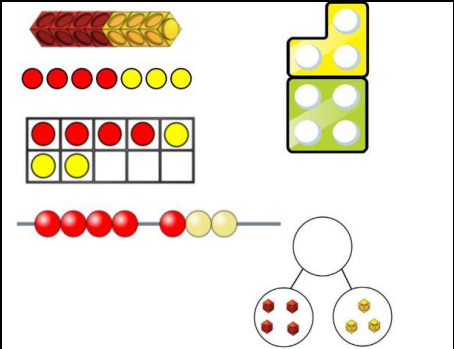
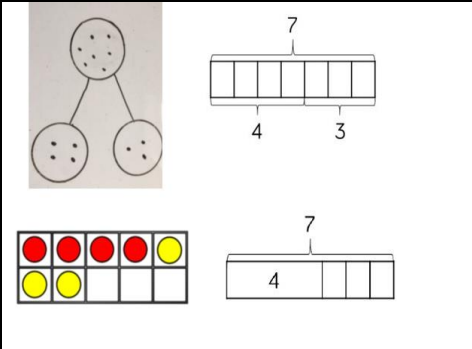
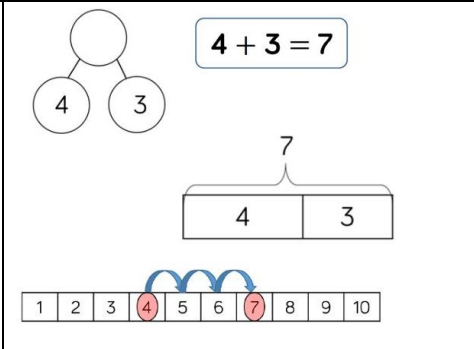
Alongside this calculation policy, there are a set of videos that can be found on the school website. The videos give a step by step breakdown of each written method and are accompanied by questions and answers to allow practise of these strategies from home.

Note: The terms “units” and “ones” are used interchangeably in both this policy and the tutorial videos.

# Addition

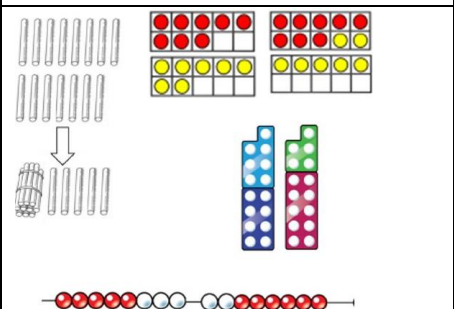
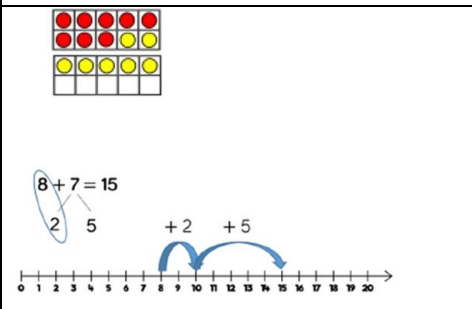
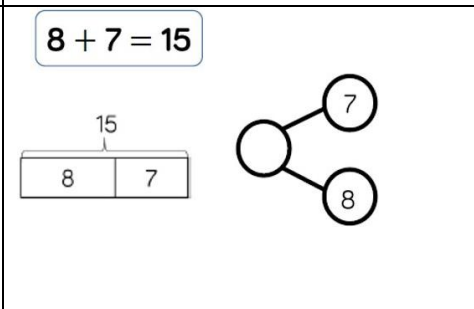
## Year R and 1:

**Skill: Add 1-digit numbers within 10 (example  $4+3 =$ ) and subitizing (recognise quantities without counting).**

Concrete	Pictorial	Abstract
		
<p>Combining two parts to make a whole (use other resources too e.g. eggs, shells, teddy bears, cars). Counting on using number lines, beaded strings, cubes or Numicon.</p>	<p>Children to represent the cubes using continuous or combination bar models. They could put each part on a part whole model using dots or other representations.</p>	<p>Children could use a number track to help them jump forwards for the addition. They could use a part-whole model to show that 4 is a part, 3 is a part and the whole is seven.</p>
<p><b>Key language: sum, total, parts and wholes, plus, add, altogether, more, 'is equal to' 'is the same as'.</b> <b>Stem Sentence – One part is _____, another part is _____ and the whole is _____.</b></p>		

## Year 1 and 2:

**Skill: Add 1 and 2-digit numbers to 20 (example  $8+7 =$ ).**

Concrete	Pictorial	Abstract
		
<p>Regrouping to make 10; physically using ten frames and counters/cubes or using Numicon. Highlighting the importance of crossing the ten.</p>	<p>Understanding how to partition numbers to make the addition easier using pictorial representations such as tens frames and number lines.</p>	<p>Understanding how to partition numbers to make the addition easier using pictorial representations such as tens frames and number lines.</p>
<p><b>Key language: sum, total, parts and wholes, plus, add, altogether, more, 'is equal to' 'is the same as'.</b> <b>One part is _____, another part is _____ and the whole is _____.</b></p>		

## Year 2:

**Skill: Add three 1-digit numbers (7+6+3=).**

Concrete	Pictorial	Abstract
<p>Physically using ten frames and counters, cubes or Numicon to regroup and create ten. Highlighting the importance of crossing the ten.</p>	<p>Understanding how to partition numbers to make the addition easier using pictorial representations such as tens frames, bar models and number lines.</p>	<p>Complete part-whole models, bar models with a mental understanding of partitioning.</p>
<p><b>Key language: sum, total, parts and wholes, plus, add, altogether, more, 'is equal to' 'is the same as', regroup.</b>  <b>One part is ____, another part is ____ and the whole is ____.</b></p>		

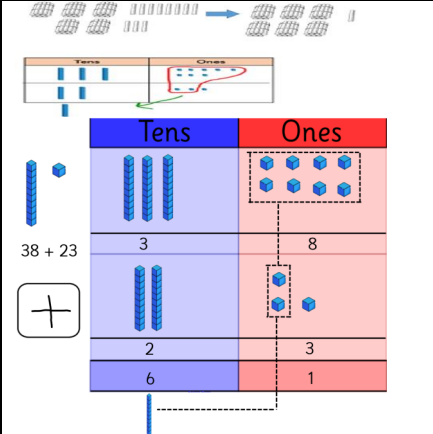
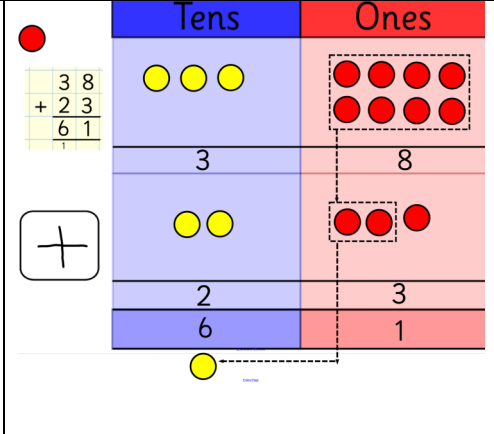
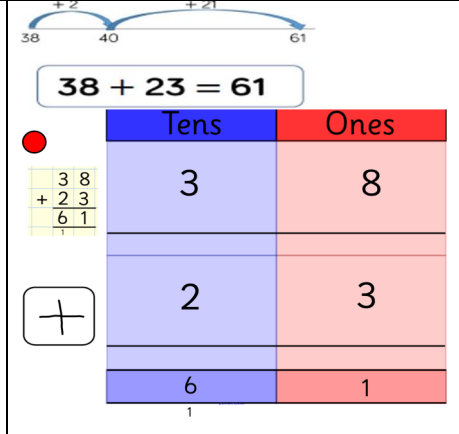
## Year 2:

**Skill: Add 1-digit and 2-digit numbers to 100.**

Concrete	Pictorial	Abstract
<p>Continue to develop understanding of partitioning and place value by physically regrouping tens.</p>	<p>Children can use number lines, continuous bar models and number squares for working out and support their answers.</p>	<p>Complete part-whole models number lines with a mental understanding of partitioning.</p>
<p><b>Key language: sum, total, parts and wholes, plus, add, altogether, more, 'is equal to' 'is the same as', regroup.</b></p>		

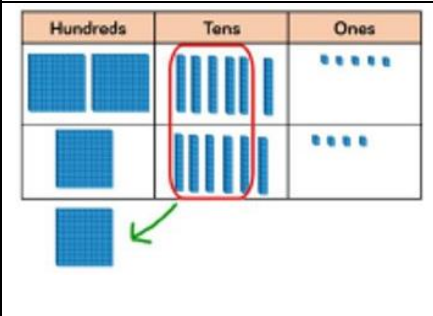
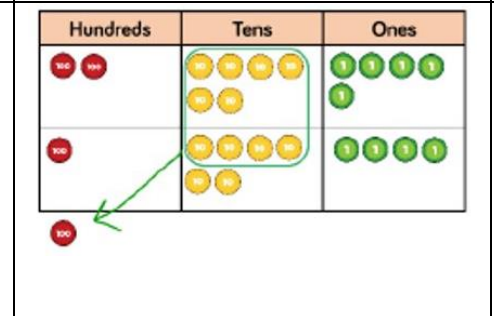
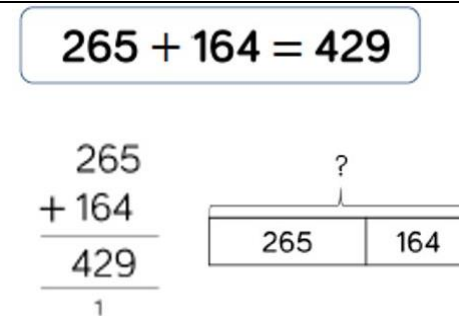
## Year 2:

**Skill: Add 2-digit numbers to 100.**

Concrete	Pictorial	Abstract
		
<p>Continue to develop understanding of partitioning and place value by physically regrouping tens to cross the ten boundary. Use a place value grid to physically move and regroup.</p>	<p>Addition using drawn counters to regroup and exchange ten ones to a ten to develop an understanding of the process.</p>	<p>Addition using partitioning and a number line jumping to multiples of 10 to become more efficient. Use the formal written methods when calculating two 2-digit numbers. Moving away from drawing counters to using numerals.</p>
<p><b>Key language: sum, total, parts and wholes, plus, add, altogether, more, 'is equal to' 'is the same as', exchange, re-group.</b></p>		

## Year 3:

**Skill: Add numbers up to 3 digits.**

Concrete	Pictorial	Abstract
		
<p>Use base 10 and place value counters as manipulatives to physically add 3-digit numbers to show the exchange process. Children to write out their calculation alongside.</p>	<p>Addition using drawn counters to regroup and exchange ten 1s to a 10 and ten 10s to a 100 to develop an understanding of the process. Children to write out calculation alongside to see the links to the written method.</p>	<p>Use the formal written method when calculating 3-digit numbers.</p>
<p><b>Key language: sum, total, parts and wholes, plus, add, altogether, more, 'is equal to' 'is the same as', exchange, re-group.</b></p>		

## Year 4:

**Skill:** Add numbers up to 4 digits.

Concrete	Pictorial	Abstract
<p>Use base 10 and place value counters as manipulatives to physically add 4-digit numbers to show the exchange process. Children to write out their calculation alongside.</p>	<p>Addition using drawn counters to regroup and exchange ten 1s to a 10, ten 10s to a 100 and ten 100s to a 1000 to develop an understanding of the process. Children to write out calculation alongside to see the links to the written method.</p>	<p>Use the formal written method when calculating 4-digit numbers.</p>
<p><b>Key language:</b> sum, total, parts and wholes, plus, add, altogether, more, 'is equal to' 'is the same as', exchange, re-group.</p>		

## Year 5:

**Skill:** Add with up to 3 decimal places.

Concrete	Pictorial	Abstract
<p>Physically use place value counters as manipulatives to add and regroup values to re-enforce process and value of each column. Put it into context by using money and measures in baking etc.</p>	<p>Addition using drawn counters to regroup and exchange up to three decimal places. Children to write out calculation alongside to see the links to the written method.</p>	<p>Use the formal written method when calculating decimal numbers.</p>
<p><b>Key language:</b> sum, total, parts and wholes, plus, add, altogether, more, 'is equal to' 'is the same as', exchange, re-group.</p>		

# Year 5 and 6:

**Skill: Add numbers with more than 4 digits.**

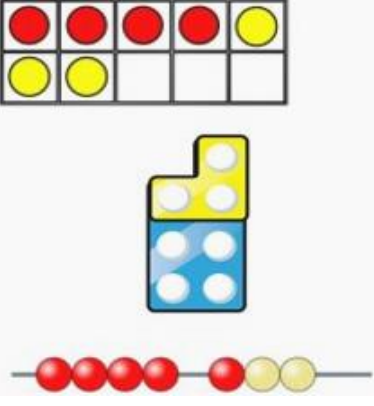
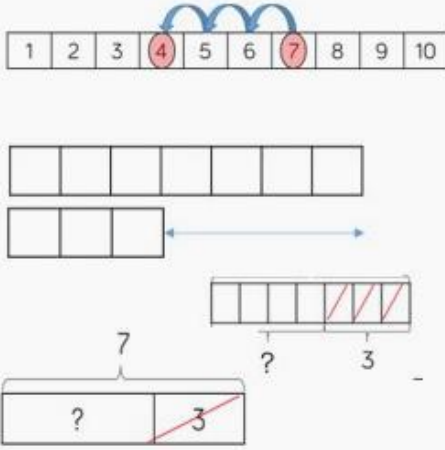
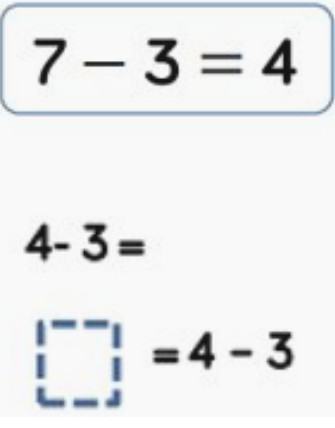
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1	0	4	3	2	8																					
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1	6	6	0	5	9																					
<p>Use base 10 and place value counters as manipulatives to physically add numbers to show the exchange process. Children to write out their calculation alongside.</p>	<p>Addition using drawn counters with no value to regroup and exchange. Children to write out calculation alongside to see the links to the written method.</p>	<p>Use the formal written method when calculating any number.</p>																								
<p><b>Key language: sum, total, parts and wholes, plus, add, altogether, more, 'is equal to' 'is the same as', exchange, re-group.</b></p>																										



# Subtraction

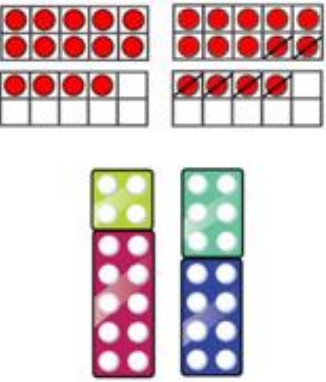
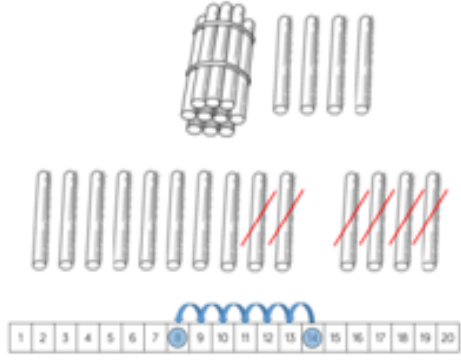
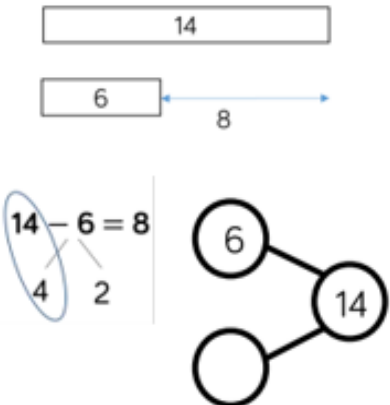
Year R and 1:

Skill: Subtract 1-digit numbers within 10.

Concrete	Pictorial	Abstract
		
<p>Subtraction using physical resources: tens frames with counters, Numicon and bead strings. Physically taking objects away.</p>	<p>Subtraction using number lines and bar models – counting back and crossing out.</p>	<p>Completing part-whole models and missing numbers.</p>
<p><b>Key language:</b> subtraction, total, parts and wholes, take-away, altogether.  <b>Stem Sentence –</b> One less than _____ is _____. Two less than _____ is _____.</p>		

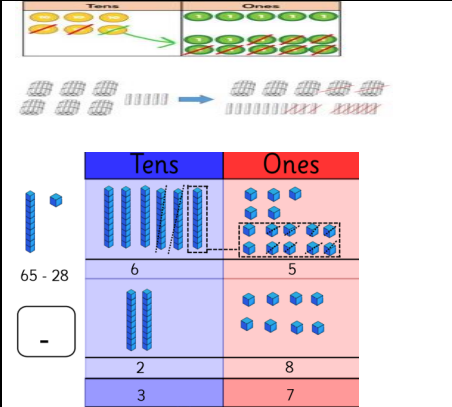
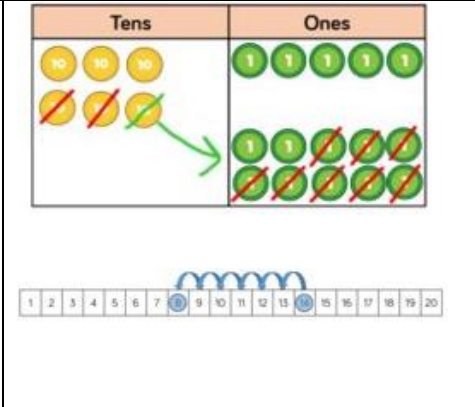
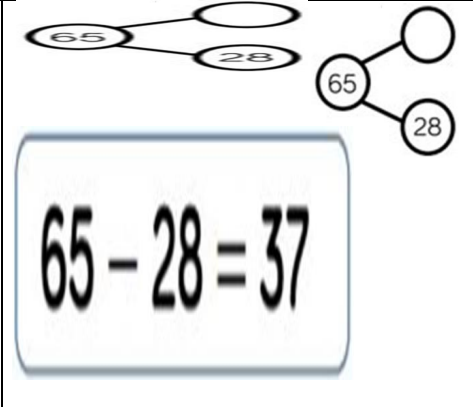
Year 1 and 2:

Skill: Subtract 1 and 2-digit numbers to 20.

Concrete	Pictorial	Abstract
		
<p>Subtraction using physical resources: tens frames with counters, Numicon and bead strings. Physically taking objects away. Begin to exchange a 10 for 10 ones.</p>	<p>Subtraction using number lines and bar models – counting back and crossing out. Begin to exchange a ten for 10 ones.</p>	<p>Completing part-whole models and missing numbers.</p>
<p><b>Key language:</b> subtraction, total, parts and wholes, take-away, altogether, place value, exchange, tens, ones.  <b>Stem Sentence –</b> Seven less than _____ is _____. Nine less than _____ is _____.</p>		

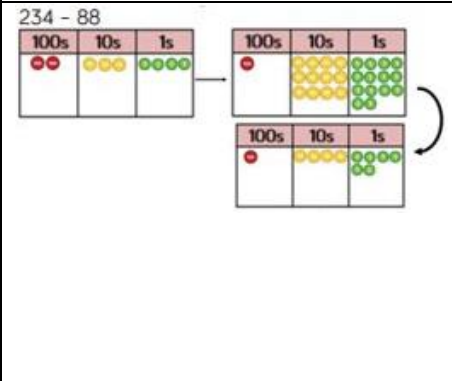
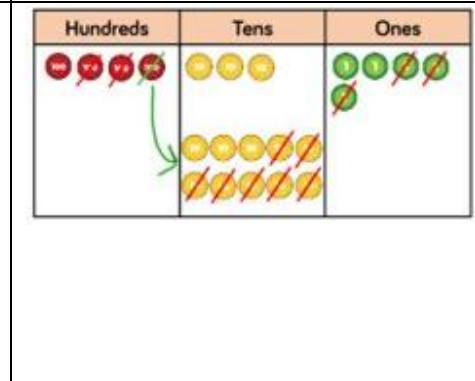
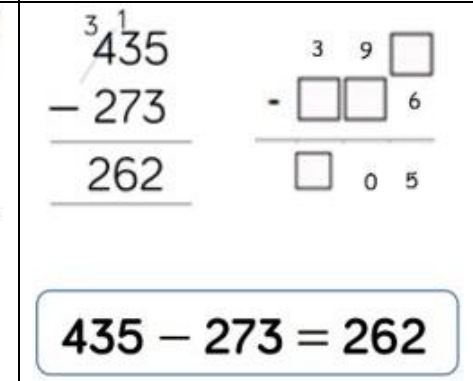
## Year 2:

**Skill: Subtract 1 and 2-digit numbers to 100.**

Concrete	Pictorial	Abstract
 <p>Concrete resources for 65 - 28: physical objects, place value grids, and bead strings. The grid shows 6 tens and 5 ones. A ten is exchanged for 10 ones, leaving 5 tens and 15 ones. Then 2 tens and 8 ones are subtracted, leaving 3 tens and 7 ones.</p>	 <p>Pictorial resources for 65 - 28: place value grids and a number line. The grid shows 6 tens and 5 ones. A ten is exchanged for 10 ones. Then 2 tens and 8 ones are crossed out, leaving 3 tens and 7 ones. The number line shows a jump from 65 to 28.</p>	 <p>Abstract resources for 65 - 28: a tree diagram showing 65 as 60 + 5 and 28 as 20 + 8. The formal written method is <math>65 - 28 = 37</math>.</p>
<p>Subtraction using physical resources: Place value grids with counters and bead strings. Physically taking objects away. Exchanging 10s for 10 ones.</p>	<p>Subtraction place value grids to draw counters and cross out to exchange a ten for 10 ones.</p>	<p>Completing formal written methods.</p>
<p><b>Key language: subtraction, total, parts and wholes, take-away, altogether, place value, exchange, tens, ones.</b></p>		

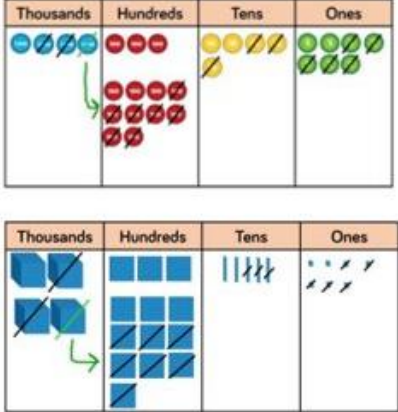
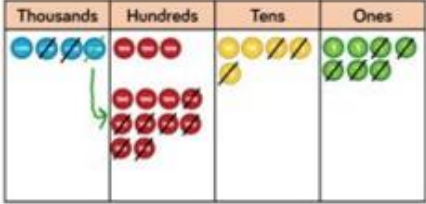
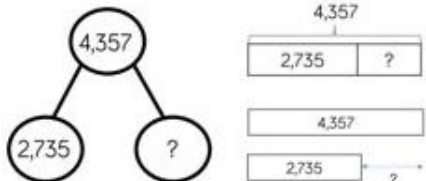
## Year 3:

**Skill: Subtract numbers with up to 3 numbers.**

Concrete	Pictorial	Abstract
 <p>Concrete resources for 234 - 88: place value grids. The grid shows 2 hundreds, 3 tens, and 4 ones. A hundred is exchanged for 10 tens, leaving 1 hundred and 13 tens. Then 8 tens and 8 ones are subtracted, leaving 1 hundred, 5 tens, and 6 ones.</p>	 <p>Pictorial resources for 234 - 88: place value grids. The grid shows 2 hundreds, 3 tens, and 4 ones. A hundred is exchanged for 10 tens. Then 8 tens and 8 ones are crossed out, leaving 1 hundred, 5 tens, and 6 ones.</p>	 <p>Abstract resources for 234 - 88: formal written methods. The method shows <math>435 - 273 = 262</math> with missing numbers in boxes.</p>
<p>Subtraction using physical resources: Place value grids with counters and bead strings. Physically taking objects away. Exchanging 100s and 10s.</p>	<p>Subtraction using place value grids to draw counters and cross out to exchange 100s and 10s.</p>	<p>Completing formal written methods, including ones with missing numbers.</p>
<p><b>Key language: subtraction, total, parts and wholes, take-away, altogether, place value, exchange, hundreds, tens, ones.</b></p>		

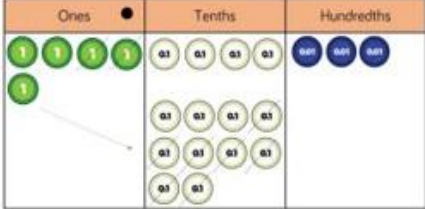
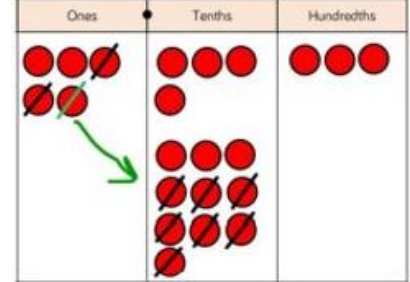
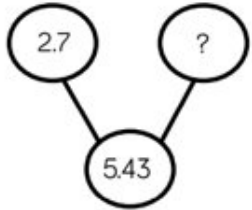
## Year 4:

**Skill: Subtract numbers with up to 4 numbers.**

Concrete	Pictorial	Abstract
		$\begin{array}{r} 3 \quad 1 \\ 4357 \\ - 2735 \\ \hline 1622 \end{array}$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <math>4,357 - 2,735 = 1,622</math> </div> 
<p>Subtraction using physical resources: Place value grids with counters and base 10. Physically taking objects away. Exchanging 100s and 10s.</p>	<p>Subtraction using place value grids to draw counters and cross out to exchange 100s and 10s.</p>	<p>Completing formal written methods, including ones with missing numbers.</p>
<p><b>Key language: subtraction, total, parts and wholes, take-away, altogether, place value, exchange, hundreds, tens, ones.</b></p>		

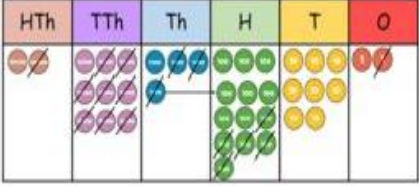
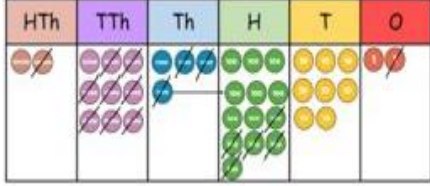
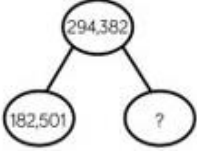
## Year 5:

**Skill: Subtract numbers with up to 3 decimal places.**

Concrete	Pictorial	Abstract
		$\begin{array}{r} 4 \quad 1 \\ 5.43 \\ - 2.7 \\ \hline 2.73 \end{array}$  <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <math>5.43 - 2.7 = 2.73</math> </div>
<p>Subtraction using physical resources: Place value grids with counters. Physically taking objects away. Exchanging 10s 1s and 0.1s.</p>	<p>Subtraction using place value grids to draw counters and cross out to exchange 100s and 10s.</p>	<p>Completing formal written methods, including ones with missing numbers.</p>
<p><b>Key language: subtraction, total, parts and wholes, take-away, altogether, place value, exchange, hundreds, tens, ones, tenths, decimals</b></p>		

# Year 5 and 6:


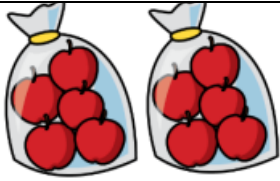
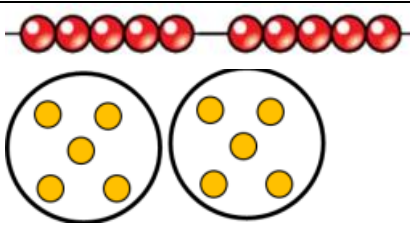
**Skill: Subtract numbers with more than 4 digits.**

Concrete	Pictorial	Abstract																					
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-	1	8	2	5	0	1																	
	1	1	1	8	8	1																	
<p>Use physical resources such as place value grids with counters. Physically taking objects away. Exchanging 10s 1s and 0.1s.</p>	<p>Subtraction using place value grids to draw counters and cross out to exchange 100s and 10s.</p>	<p>Completing formal written methods, including ones with missing numbers.</p>																					
<p><b>Key language: subtraction, total, parts and wholes, take-away, altogether, place value, exchange, hundreds, tens, ones, tenths, decimals</b></p>																							

# Multiplication

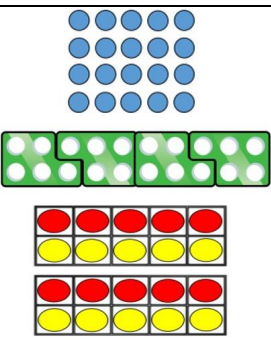
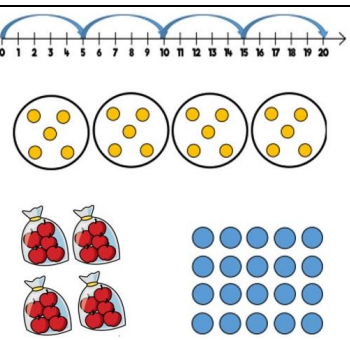
Year R:

Skill: Doubling 1-digit numbers.

Concrete	Pictorial	Abstract
		
<p>Double numbers by placing visual prompts and objects into 2 equal groups and adding the amounts together.</p>	<p>Use of pictures to represent equal groups of objects and items.</p>	<p>Begin to recognise that a double requires two equal groups with the same amount in each group.</p>
<p><b>Key language:</b> groups of, equal groups of _____ equal groups of _____ is _____.</p>		

Year 1 and 2:

Skill: Solve 1-step problems using multiplication.

Concrete	Pictorial	Abstract
		<p>One bag holds 5 apples. How many apples do 4 bags hold?</p> $5 + 5 + 5 + 5 = 20$ $4 \times 5 = 20$ $5 \times 4 = 20$
<p>Use of concrete resources to show multiplication as repeated addition and help children understand the multiplication process. Use these concrete resources to solve problems. Multiplication symbol introduced in year 2.</p>	<p>Use of pictures to represent multiplication as repeated addition. Representation of multiplication to solve problems. Multiplication symbol introduced in year 2. Written method goes alongside representation.</p>	<p>After using concrete and pictorial representations, children will record multiplications using the multiplication symbol.</p>
<p><b>Key language:</b> multiplication, repeated addition, lots of, times, multiplied by, groups of, equal groups of _____ equal groups of _____ is _____.</p>		

## Year 3 and 4:

**Skill: Multiply 2-digit numbers by 1-digit numbers.**

Concrete	Pictorial	Abstract																																			
		$34 \times 3 = 102$ <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td colspan="3" style="text-align: right;"><small>Follow these steps:</small></td> </tr> <tr> <td style="text-align: right;"><small>1. Partition</small></td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;"><small>2. Multiply</small></td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;"><small>3. Add using column addition</small></td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;"><small>4. Check</small></td> <td></td> <td></td> </tr> </table> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; margin: 10px auto; width: 80%; text-align: center;"> <math display="block">34 \times 5 = 170</math> </div> <table border="1" style="margin-left: auto; margin-right: auto; text-align: center;"> <tr> <td></td> <td>H</td> <td>T</td> <td>O</td> </tr> <tr> <td></td> <td></td> <td>3</td> <td>4</td> </tr> <tr> <td style="text-align: right;">×</td> <td></td> <td></td> <td>5</td> </tr> <tr> <td></td> <td>1</td> <td>7</td> <td>0</td> </tr> <tr> <td></td> <td></td> <td>1</td> <td>2</td> </tr> </table>	<small>Follow these steps:</small>			<small>1. Partition</small>			<small>2. Multiply</small>			<small>3. Add using column addition</small>			<small>4. Check</small>				H	T	O			3	4	×			5		1	7	0			1	2
<small>Follow these steps:</small>																																					
<small>1. Partition</small>																																					
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	H	T	O																																		
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	1	7	0																																		
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<p>Physically use concrete resources to show equal groups and to help children understand the process of multiplication and exchanging when multiplying.</p>	<p>Use of pictures to show equal groups and to help children understand exchanging when multiplying. Written method goes alongside representation.</p>	<p>After using concrete and pictorial representations, children will record multiplications using the formal written method.</p>																																			
<p><b>Key language: multiplication, repeated addition, lots of, times, multiplied by, groups of, equal groups of _____ multiplied by _____ is _____.</b></p>																																					

## Year 4:

**Skill: Multiply 3-digit numbers by 1-digit numbers.**

Concrete	Pictorial	Abstract																				
		<div style="border: 1px solid black; border-radius: 10px; padding: 5px; margin-bottom: 10px; text-align: center;"> <math display="block">245 \times 4 = 980</math> </div> <table border="1" style="margin-left: auto; margin-right: auto; text-align: center;"> <tr> <td></td> <td>H</td> <td>T</td> <td>O</td> </tr> <tr> <td></td> <td>2</td> <td>4</td> <td>5</td> </tr> <tr> <td style="text-align: right;">×</td> <td></td> <td></td> <td>4</td> </tr> <tr> <td></td> <td>9</td> <td>8</td> <td>0</td> </tr> <tr> <td></td> <td></td> <td>1</td> <td>2</td> </tr> </table>		H	T	O		2	4	5	×			4		9	8	0			1	2
	H	T	O																			
	2	4	5																			
×			4																			
	9	8	0																			
		1	2																			
<p>Use of concrete resources to show equal groups and to help children understand the process of multiplication and exchanging when multiplying.</p>	<p>Use of pictures to show equal groups and to help children understand exchanging when multiplying. Written method goes alongside representation.</p>	<p>After using concrete and pictorial representations, children will record multiplications using the formal written method.</p>																				
<p><b>Key language: multiplication, repeated addition, lots of, times, multiplied by, groups of, equal groups of _____ multiplied by _____ is _____.</b></p>																						

## Year 5:

## Skill: Multiply 4-digit numbers by 1-digit numbers.

Pictorial	Abstract																									
	$1,826 \times 3 = 5,478$ <table border="1" data-bbox="837 353 1121 616"> <thead> <tr> <th></th> <th>Th</th> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td></td> <td>1</td> <td>8</td> <td>2</td> <td>6</td> </tr> <tr> <td>x</td> <td></td> <td></td> <td></td> <td>3</td> </tr> <tr> <td></td> <td>5</td> <td>4</td> <td>7</td> <td>8</td> </tr> <tr> <td></td> <td>2</td> <td></td> <td>1</td> <td></td> </tr> </tbody> </table>		Th	H	T	O		1	8	2	6	x				3		5	4	7	8		2		1	
	Th	H	T	O																						
	1	8	2	6																						
x				3																						
	5	4	7	8																						
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<p>Use of pictures to show equal groups and to help children understand exchanging when multiplying. Written method goes alongside representation.</p>	<p>After using concrete and pictorial representations, children will record multiplications using the formal written method.</p>																									
<p><b>Key language:</b> multiplication, repeated addition, lots of, times, multiplied by, groups of, equal groups of _____ multiplied by _____ is _____.</p>																										

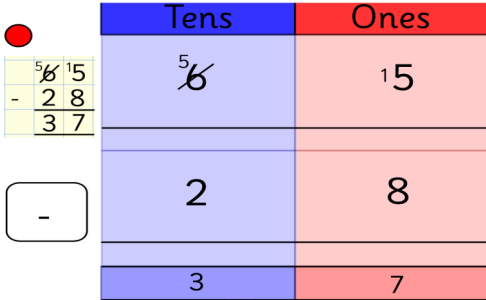
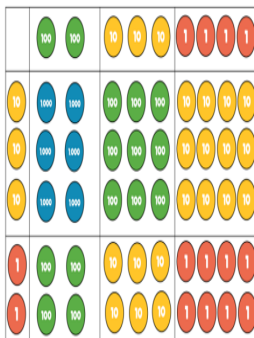
## Year 5:

## Skill: Multiply 2-digit numbers by 2-digit numbers.

Pictorial	Abstract																								
$22 \times 31 = 682$	$22 \times 31 = 682$ <table border="1" data-bbox="762 1299 1002 1646"> <thead> <tr> <th></th> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td>2</td> <td>2</td> </tr> <tr> <td>x</td> <td></td> <td>3</td> <td>1</td> </tr> <tr> <td></td> <td></td> <td>2</td> <td>2</td> </tr> <tr> <td></td> <td>6</td> <td>6</td> <td>0</td> </tr> <tr> <td></td> <td>6</td> <td>8</td> <td>2</td> </tr> </tbody> </table>		H	T	O			2	2	x		3	1			2	2		6	6	0		6	8	2
	H	T	O																						
		2	2																						
x		3	1																						
		2	2																						
	6	6	0																						
	6	8	2																						
<p>Use of pictures to show equal groups and to help children understand exchanging when multiplying. Written method goes alongside representation.</p>	<p>After using concrete and pictorial representations, children will record multiplications using the formal written method.</p>																								
<p><b>Key language:</b> multiplication, repeated addition, lots of, times, multiplied by, groups of, equal groups of _____ multiplied by _____ is _____.</p>																									

## Year 5:

## Skill: Multiply 3-digit numbers by 2-digit numbers.

Pictorial	Abstract
<div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin-bottom: 10px;"> <math>234 \times 32 = 7,488</math> </div> 	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin-bottom: 10px;"> <math>234 \times 32 = 7,488</math> </div> 
<p>Use of pictures to show equal groups and to help children understand exchanging when multiplying. Written method goes alongside representation.</p>	<p>After using concrete and pictorial representations, children will record multiplications using the formal written method.</p>
<p><b>Key language:</b> multiplication, repeated addition, lots of, times, multiplied by, groups of, equal groups of _____ multiplied by _____ is _____.</p>	

## Year 5 and 6:

## Skill: Multiply 4-digit numbers by 2-digit numbers.


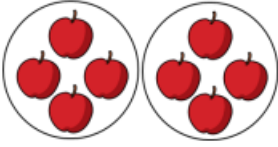
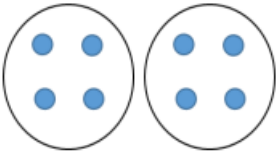
Abstract																																														
<div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin-bottom: 10px;"> <math>2,739 \times 28 = 76,692</math> </div> <table border="1" data-bbox="113 1305 443 1720"> <tr> <td>TTh</td> <td>Th</td> <td>H</td> <td>T</td> <td>O</td> </tr> <tr> <td></td> <td>2</td> <td>7</td> <td>3</td> <td>9</td> </tr> <tr> <td>x</td> <td></td> <td></td> <td>2</td> <td>8</td> </tr> <tr> <td>2</td> <td>1</td> <td>9</td> <td>1</td> <td>2</td> </tr> <tr> <td><sub>2</sub></td> <td><sub>5</sub></td> <td><sub>3</sub></td> <td><sub>7</sub></td> <td></td> </tr> <tr> <td>5</td> <td>4</td> <td>7</td> <td>8</td> <td>0</td> </tr> <tr> <td><sub>1</sub></td> <td></td> <td><sub>1</sub></td> <td></td> <td></td> </tr> <tr> <td>7</td> <td>6</td> <td>6</td> <td>9</td> <td>2</td> </tr> <tr> <td></td> <td></td> <td><sub>1</sub></td> <td></td> <td></td> </tr> </table>		TTh	Th	H	T	O		2	7	3	9	x			2	8	2	1	9	1	2	<sub>2</sub>	<sub>5</sub>	<sub>3</sub>	<sub>7</sub>		5	4	7	8	0	<sub>1</sub>		<sub>1</sub>			7	6	6	9	2			<sub>1</sub>		
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# Division



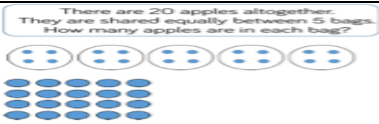
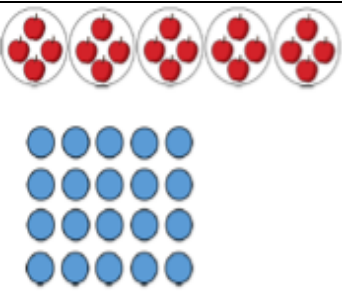
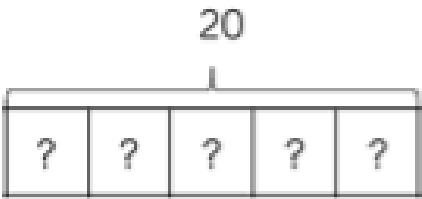
## Year R:

**Skill: Halving numbers less than 12.**

Concrete	Pictorial	Abstract
		
<p>Halve the numbers by placing an amount of objects into 2 equal groups using the language, "one for you and one for me".</p>	<p>Use of pictures to represent equal groups of objects and items.</p>	<p>Begin to recognise that halving means splitting into two equal groups with the same amount in each group.</p>
<p><b>Key language: share, group, half, groups of, array</b></p> <p>_____ shared into _____ equal groups is _____</p>		

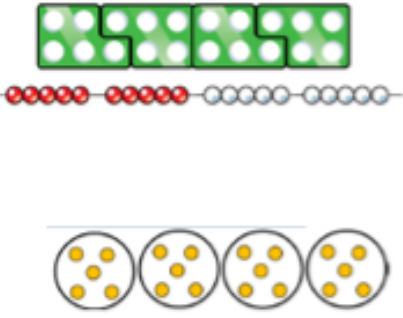
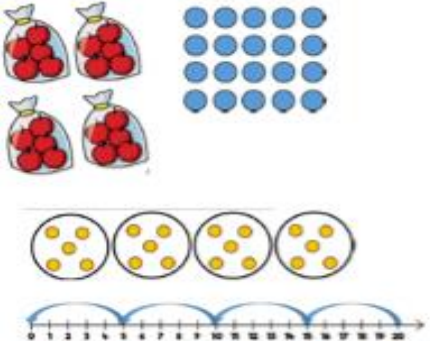
## Year 1 and 2:

**Skill: Solve 1-step problems using multiplication (sharing).**

Concrete	Pictorial	Abstract
<p>There are 20 apples altogether. They are shared equally between 5 bags. How many apples are in each bag?</p> 		<p><math>20 \div 5 = 4</math></p> 
<p>Share physical resources and amounts into equal groups. Create arrays with counters to show that multiplication and division are inverse.</p>	<p>Draw pictorial representations and arrays to help solve the problem.</p>	<p>Apply times tables and knowledge of repeated addition to solve the problem mentally.</p>
<p><b>Key language: share, group, divide, divided by, half, groups of, array</b></p> <p>_____ shared into _____ equal groups is _____</p>		

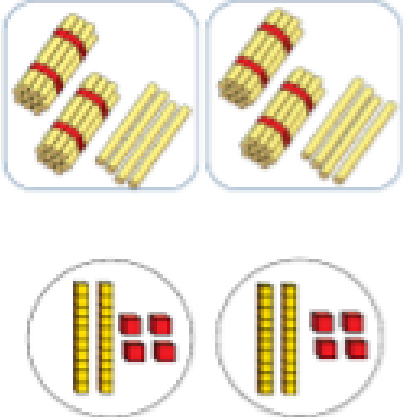
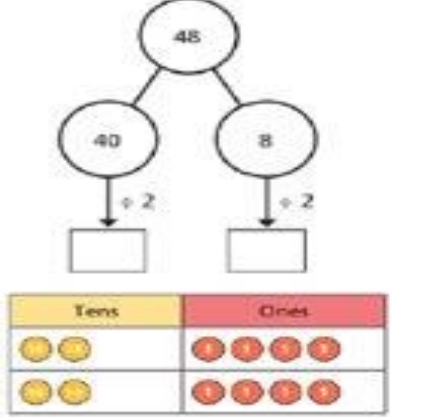
## Year 1 and 2:

## Skill: Solve 1-step problems using division (grouping).

Concrete	Pictorial	Abstract
		$20 \div 5 = 4$ <div style="border: 1px solid black; border-radius: 10px; padding: 10px; margin-top: 10px;"> <p>There are 20 apples altogether. They are put in bags of 5. How many bags are there?</p> </div>
<p>Share physical resources and amounts into equal groups.</p> <p>Create arrays with counters to show that multiplication and division are inverse.</p>	<p>Share physical resources and amounts into equal groups.</p> <p>Create arrays with counters to show that multiplication and division are inverse.</p>	<p>Share physical resources and amounts into equal groups.</p> <p>Create arrays with counters to show that multiplication and division are inverse.</p>
<p><b>Key language:</b> Key language: share, group, divide, divided by, half, groups of, array</p> <p>_____ grouped into _____ is _____ equal groups.</p>		

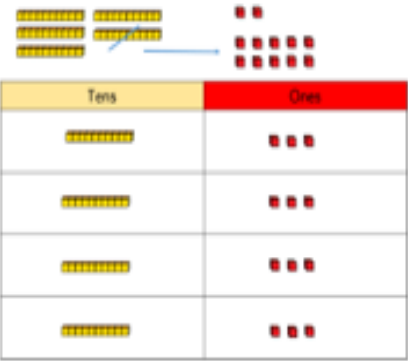
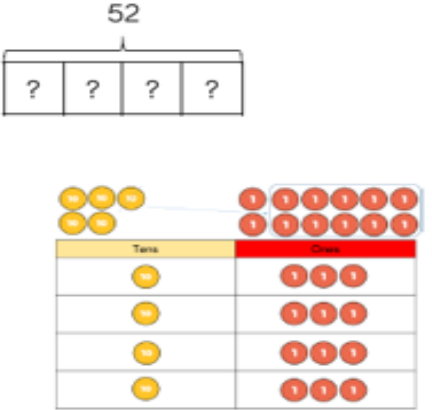
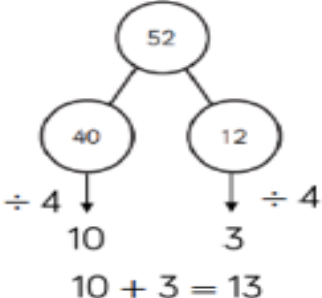
## Year 2:

### Skill: Divide 2-digits by 1-digit (sharing with no exchange).

Concrete	Pictorial	Abstract
		<div style="border: 1px solid black; border-radius: 10px; padding: 10px; text-align: center;"> <math display="block">48 \div 2 = 24</math> </div>
<p>Use manipulatives that allow children to partition into tens and ones.</p> <p>Share numbers into equal groups using straws, base ten, counters and physical objects.</p>	<p>Use manipulatives that allow children to partition into tens and ones.</p> <p>Share numbers into equal groups using straws, base ten, counters and physical objects.</p>	<p>After using concrete and pictorial representations children should be able to record their calculation using the division symbol.</p>
<p><b>Key language:</b> Key language: share, group, divide, divided by, half, groups of, array</p> <p>_____ divided by _____ is _____.</p>		


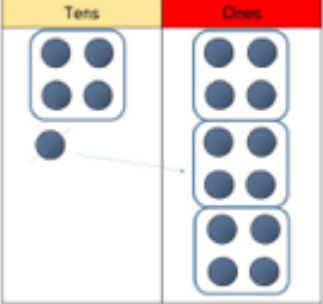

## Year 2:

## Skill: Divide 2-digits by 1-digit (sharing with exchange).

Concrete	Pictorial	Abstract
		<div style="border: 1px solid black; border-radius: 10px; padding: 5px; text-align: center; width: fit-content; margin: 0 auto;"> <math>52 \div 4 = 13</math> </div> 
<p>Use manipulatives to allow children to exchange and share equally.</p>	<p>Bar models can also help children organise their ideas and share into equal groups. Children draw counters to share 2-digit numbers equally.</p>	<p>After using concrete and pictorial representations children should be able to record their calculation using the division symbol.</p>
<p><b>Key language:</b> Key language: share, group, divide, divided by, half, groups of, array</p> <p>_____ divided by _____ is _____.</p>		

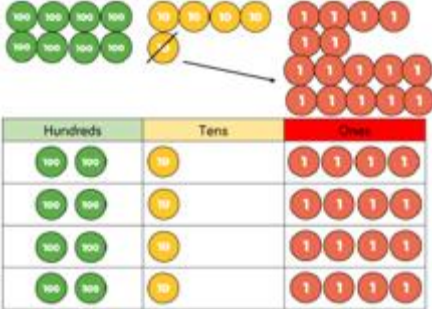
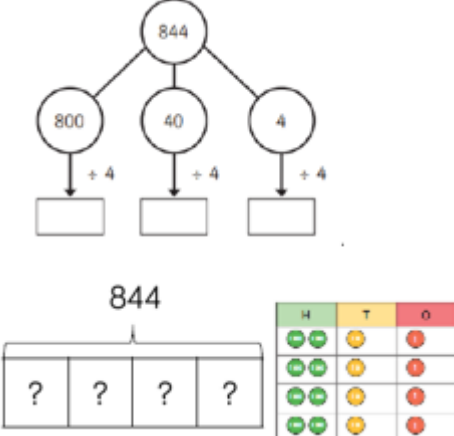
## Year 3 and 4:

### Skill: Divide 2-digits by 1-digit (grouping).

Concrete	Pictorial	Abstract
		<div style="border: 1px solid black; border-radius: 10px; padding: 5px; text-align: center; width: fit-content; margin: 0 auto;"> <math>52 \div 4 = 13</math> </div> 
<p>Use manipulatives to allow children to physically explore how many groups of 4 can be made and see if exchanges are needed.</p>	<p>Draw counters to show how many groups of 4 can be made and if exchanges are needed.</p>	<p>Using the short division method to group by divisor.</p>
<p><b>Key language:</b> Key language: share, group, divide, divided by, half, groups of, array</p> <p>_____ divided by _____ is _____.</p>		

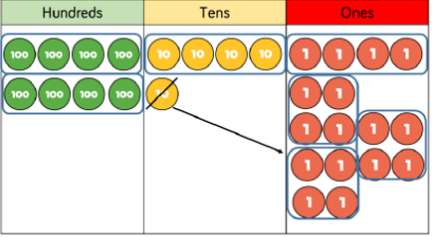
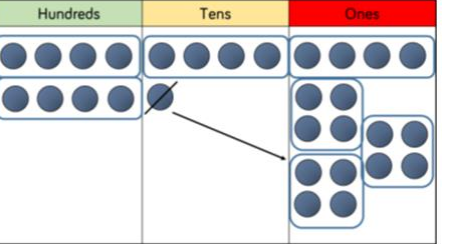
## Year 4:

**Skill: Divide 3-digits by 1-digit (sharing).**

Concrete	Pictorial	Abstract								
		$844 \div 4 = 211$ <table border="1" data-bbox="1082 409 1422 584"> <tr><td></td><td>2</td><td>1</td><td>1</td></tr> <tr><td>4</td><td>8</td><td>4</td><td>4</td></tr> </table>		2	1	1	4	8	4	4
	2	1	1							
4	8	4	4							
<p>Use manipulatives to allow children to physically explore how many groups of 4 can be made and if exchanges are needed.</p>	<p>Draw counters to show how many groups of 4 can be made and if exchanges are needed.</p>	<p>Using the short division method to group by divisor. Remainders are also shown when required.</p>								
<p><b>Key language:</b> Key language: share, group, divide, divided by, half, groups of, array          _____ divided by _____ is _____.</p>										

## Year 5:

**Skill: Divide 3-digits by 1-digit (grouping).**

Concrete	Pictorial	Abstract								
		$856 \div 4 = 214$ <table border="1" data-bbox="1082 1373 1422 1514"> <tr><td></td><td>2</td><td>1</td><td>4</td></tr> <tr><td>4</td><td>8</td><td>5</td><td>6</td></tr> </table>		2	1	4	4	8	5	6
	2	1	4							
4	8	5	6							
<p>Use manipulatives to continue to support understanding of dividing 3-digit numbers by a 1-digit number.</p>	<p>Draw counters to show how many groups can be made if exchanges are required.</p>	<p>Using the short division method to group by divisor. Remainders are also shown when required.</p>								
<p><b>Key language:</b> Key language: share, group, divide, divided by, half, groups of, array          _____ divided by _____ is _____.</p>										

## Year 5:

**Skill: Divide 4-digits by 1-digit (grouping).**

Concrete	Pictorial	Abstract										
		$8,532 \div 2 = 4,266$ <table border="1" data-bbox="1054 434 1417 584"> <tr> <td></td> <td>4</td> <td>2</td> <td>6</td> <td>6</td> </tr> <tr> <td>2</td> <td>8</td> <td>5</td> <td>13</td> <td>12</td> </tr> </table>		4	2	6	6	2	8	5	13	12
	4	2	6	6								
2	8	5	13	12								
<p>Use manipulatives to continue to support understanding of dividing 4-digit numbers by a 1-digit number.</p>	<p>Draw counters to show how many groups can be made if exchanges are required .</p>	<p>Using the short division method to group by divisor. Remainders are also shown when required.</p>										
<p><b>Key language:</b> Key language: share, group, divide, divided by, half, groups of, array          _____ divided by _____ is _____.</p>												

## Year 6:

**Skill: Divide multi digits by 2-digits (short division).**

Abstract																																		
<div style="border: 1px solid black; border-radius: 15px; padding: 10px; width: fit-content; margin: 0 auto;"> <math>7,335 \div 15 = 489</math> </div> <table border="1" data-bbox="113 1335 678 1547" style="margin-top: 10px;"> <tr> <td></td> <td>0</td> <td>4</td> <td>8</td> <td>9</td> </tr> <tr> <td>15</td> <td>7</td> <td>7<sub>3</sub></td> <td>13<sub>3</sub></td> <td>13<sub>5</sub></td> </tr> </table>		0	4	8	9	15	7	7 <sub>3</sub>	13 <sub>3</sub>	13 <sub>5</sub>	<table border="1" data-bbox="948 1218 1437 1330" style="margin-bottom: 10px;"> <tr> <td>15</td> <td>10</td> <td>20</td> <td>30</td> <td>40</td> </tr> <tr> <td>15</td> <td>10</td> <td>20</td> <td>30</td> <td>40</td> </tr> </table> <div style="border: 1px solid black; border-radius: 15px; padding: 10px; width: fit-content; margin: 0 auto;"> <math>432 \div 12 = 36</math> </div> <table border="1" data-bbox="858 1554 1469 1648" style="margin-top: 10px;"> <tr> <td></td> <td>0</td> <td>3</td> <td>6</td> </tr> <tr> <td>12</td> <td>4</td> <td>4<sub>3</sub></td> <td>7<sub>2</sub></td> </tr> </table> <table border="1" data-bbox="868 1666 1481 1756" style="margin-top: 10px;"> <tr> <td>15</td> <td>30</td> <td>45</td> <td>60</td> <td>75</td> </tr> </table>	15	10	20	30	40	15	10	20	30	40		0	3	6	12	4	4 <sub>3</sub>	7 <sub>2</sub>	15	30	45	60	75
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<p>When children begin to divide up to 4- digits by 2-digits, written methods become the most accurate as concrete and pictorial representations become less effective. Children can write out multiples to support their calculations with larger remainders.</p>																																		
<p><b>Key language:</b> Key language: share, group, divide, divided by, half, groups of, array          _____ divided by _____ is _____.</p>																																		