

Hunslet Moor Primary School



Calculation Policy

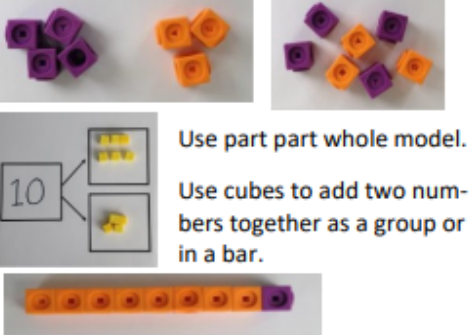
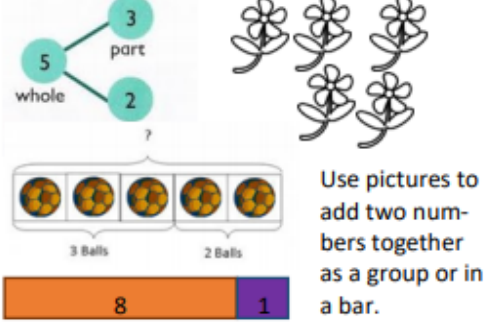


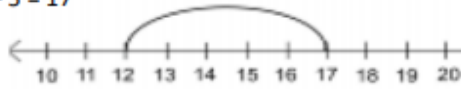
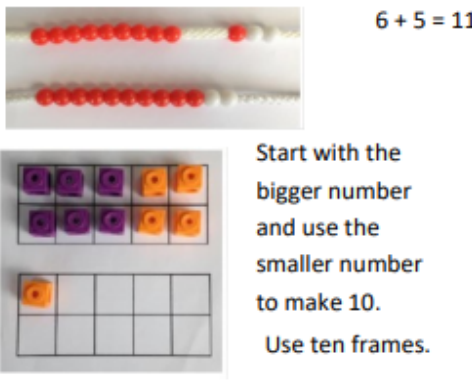
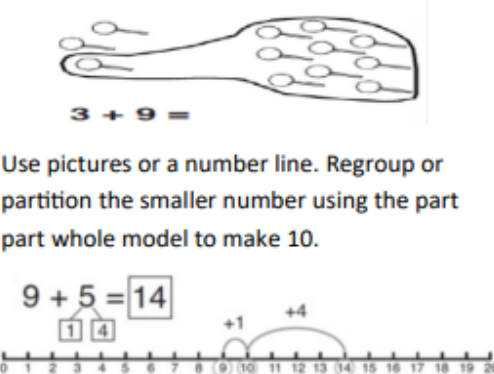

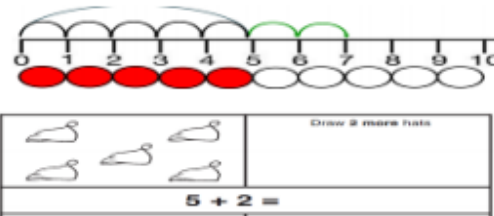
Reviewed by Subject Leader July 2023

Due to be reviewed by July 2024

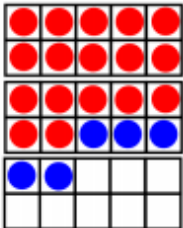
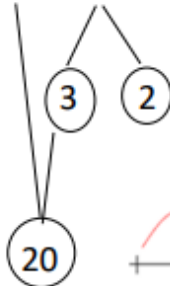
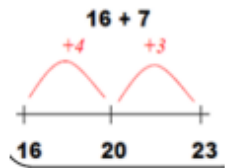
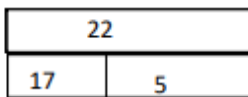

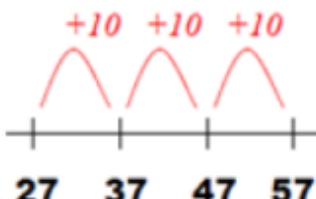

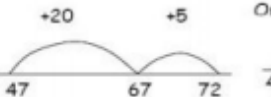
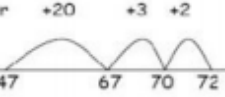
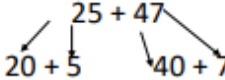


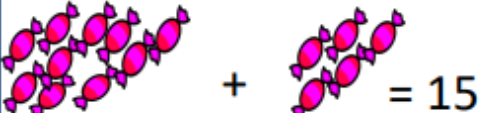
Addition Language

<p>Year 1</p>	<p>+, add, more, plus, make, sum, total, altogether, score, double, near double, one more, two more... ten more. How many more to make...? How many more is... than...? How much more is...? =, equals, sign, is the same as...</p>
<p>Year 2</p>	<p>+, add, more, plus, make, sum, total, altogether, tens, ones, double, near double, one more, two more... ten more. How many more to make...? How many more is... than...? How much more is...? =, equals, sign, is the same as...</p>
<p>Year 3</p>	<p>+, add, addition, more, plus, make, sum, total, altogether, double, near double, one more, two more... ten more... one hundred more, How many more to make...?, How many more is... than...? How much more is...? Hundreds, Tens, Ones</p>
<p>Year 4</p>	<p>Add, addition, more, plus, increase, sum, total, altogether, double, near double How many more to make...? Equals, sign, is the same as, tens boundary, hundreds boundary Inverse, Thousands, Hundreds, Tens, Ones</p>
<p>Year 5 & 6</p>	<p>Add, addition, more, plus, increase, sum, total, altogether, double, near double How many more to make...? Equals, sign, is the same as, tens boundary, hundreds boundary Inverse, Millions, Thousands, Hundreds, Tens, Ones</p>

Maths Calculation Policy 2023-2024

Objective & Strategy	Concrete	Pictorial	Abstract
<p>Combining two parts to make a whole: part- whole model</p>	 <p>Use part part whole model.</p> <p>Use cubes to add two numbers together as a group or in a bar.</p>	 <p>Use pictures to add two numbers together as a group or in a bar.</p>	<p>$4 + 3 = 7$</p>  <p>Use the part-part whole diagram as shown above to move into the abstract.</p> <p>$10 = 6 + 4$</p>
<p>Starting at the bigger number and counting on</p>	 <p>Start with the larger number on the bead string and then count on to the smaller number 1 by 1 to find the answer.</p>	<p>$12 + 5 = 17$</p>  <p>Start at the larger number on the number line and count on in ones or in one jump to find the answer.</p>	<p>$5 + 12 = 17$</p> <p>Place the larger number in your head and count on the smaller number to find your answer.</p>
<p>Regrouping to make 10.</p> <p><i>This is an essential skill for column addition later.</i></p>	 <p>Start with the bigger number and use the smaller number to make 10.</p> <p>Use ten frames.</p>	 <p>Use pictures or a number line. Regroup or partition the smaller number using the part part whole model to make 10.</p> <p>$9 + 5 = 14$</p>	<p>$7 + 4 = 11$</p> <p>If I am at seven, how many more do I need to make 10. How many more do I add on now?</p>
<p>Represent & use number bonds and related subtraction facts within 20</p>	 <p>2 more than 5.</p>	 <p>$5 + 2 =$</p>	<p>Emphasis should be on the language</p> <p>'1 more than 5 is equal to 6.'</p> <p>'2 more than 5 is 7.'</p> <p>'8 is 3 more than 5.'</p>

Objective & Strategy	Concrete	Pictorial	Abstract
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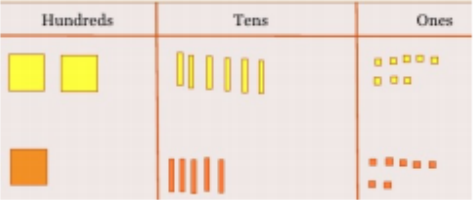
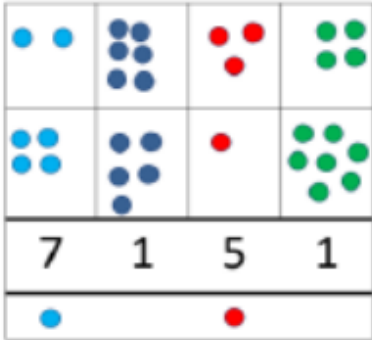
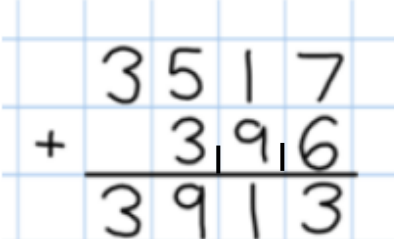
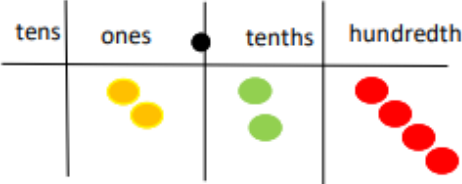
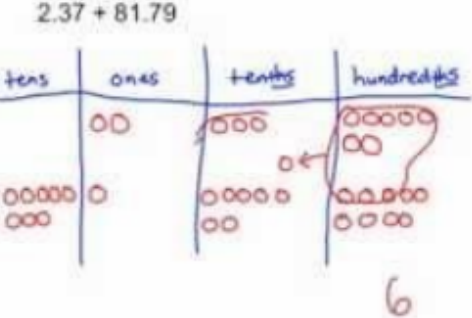
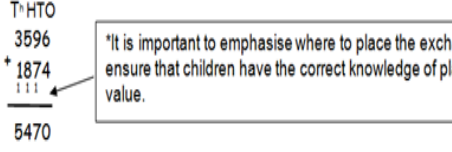
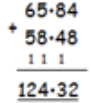
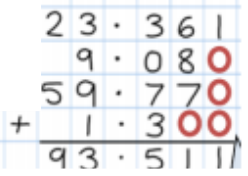
Objective & Strategy	Concrete	Pictorial	Abstract
<p>Add a two digit number and ones</p>	 <p>$17 + 5 = 22$</p> <p>Use ten frame to make 'magic ten'</p> <p>Children explore the pattern.</p> <p>$17 + 5 = 22$</p> <p>$27 + 5 = 32$</p>	<p>Use part part whole and number line to model.</p> <p>$17 + 5 = 22$</p>  	<p>$17 + 5 = 22$</p> <p>Explore related facts</p> <p>$17 + 5 = 22$</p> <p>$5 + 17 = 22$</p> <p>$22 - 17 = 5$</p> <p>$22 - 5 = 17$</p> 
<p>Add a 2 digit number and tens</p>	 <p>$25 + 10 = 35$</p> <p>Explore that the ones digit does not change</p>	<p>$27 + 30$</p>  <p>27 37 47 57</p>	<p>$27 + 10 = 37$</p> <p>$27 + 20 = 47$</p> <p>$27 + \square = 57$</p>
<p>Add two 2-digit numbers</p>	 <p>Model using dienes, place value counters and numicon</p>	 <p>Or</p>  <p>Use number line and bridge ten using part whole if necessary.</p>	<p>$25 + 47$</p>  <p>$20 + 5 = 25$ $40 + 7 = 47$</p> <p>$20 + 40 = 60$</p> <p>$5 + 7 = 12$</p> <p>$60 + 12 = 72$</p>
<p>Add three 1-digit numbers</p>	 <p>Combine to make 10 first if possible, or bridge 10 then add third digit</p>	 <p>Regroup and draw representation.</p>  <p>$= 15$</p>	<p>$4 + 7 + 6 = 10 + 7$</p> <p>$= 17$</p> <p>Combine the two numbers that make/ bridge ten then add on the third.</p>

Maths Calculation Policy 2023-2024

Objective & Strategy	Concrete	Pictorial	Abstract																																																
<p>Column Addition—no regrouping (friendly numbers)</p> <p>Add two or three 2 or 3-digit numbers.</p>	<div style="display: flex; align-items: center;"> <table border="1" style="border-collapse: collapse; text-align: center; margin-right: 10px;"> <tr> <td style="width: 50px;">T</td> <td style="width: 50px;">O</td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </table> <div style="margin-left: 10px;"> <p>Model using Dienes or numicon</p> </div> </div> <p>Add together the ones first, then the tens.</p> <table border="1" style="border-collapse: collapse; text-align: center; margin-bottom: 10px;"> <tr> <td></td> <td style="background-color: #d9534f; color: white;">Tens</td> <td style="background-color: #d9534f; color: white;">Units</td> </tr> <tr> <td style="text-align: right;">45</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">34</td> <td></td> <td></td> </tr> <tr> <td></td> <td style="border-top: 1px solid black;">7</td> <td style="border-top: 1px solid black;">9</td> </tr> </table> <div style="display: flex; align-items: center;"> <table border="1" style="border-collapse: collapse; text-align: center; margin-right: 10px;"> <tr> <td style="width: 20px;">●</td> <td style="width: 20px;">●</td> <td style="width: 20px;">●</td> <td style="width: 20px;">●</td> <td style="width: 20px;">●</td> <td style="width: 20px;">●</td> <td style="width: 20px;">●</td> <td style="width: 20px;">●</td> <td style="width: 20px;">●</td> <td style="width: 20px;">●</td> </tr> <tr> <td colspan="5" style="border-top: 1px solid black;"></td> <td colspan="5" style="border-top: 1px solid black;"></td> </tr> </table> <div style="margin-left: 10px;"> <p>Calculations</p> $\begin{array}{r} 21 + 42 = \\ 21 \\ + 42 \\ \hline \end{array}$ </div> </div> <p>Move to using place value counters</p>	T	O								Tens	Units	45			34				7	9	●	●	●	●	●	●	●	●	●	●											<p>Children move to drawing the counters using a tens and one frame.</p> <table border="1" style="border-collapse: collapse; text-align: center; margin: 10px auto;"> <tr> <td style="width: 50px;">tens</td> <td style="width: 50px;">ones</td> </tr> <tr> <td> </td> <td> </td> </tr> </table>	tens	ones			$\begin{array}{r} 223 \\ + 114 \\ \hline 337 \end{array}$ <p>Add the ones first, then the tens, then the hundreds.</p>				
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<p>Column Addition with regrouping.</p>	<table border="1" style="border-collapse: collapse; text-align: center; margin-bottom: 10px;"> <tr> <td></td> <td style="background-color: #d9534f; color: white;">Tens</td> <td style="background-color: #d9534f; color: white;">Units</td> </tr> <tr> <td style="text-align: right;">39</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">15</td> <td></td> <td></td> </tr> <tr> <td></td> <td style="border-top: 1px solid black;">5</td> <td style="border-top: 1px solid black;">4</td> </tr> </table> <p>Exchange ten ones for a ten. Model using numicon and pv counters.</p> <div style="display: flex; align-items: center;"> <table border="1" style="border-collapse: collapse; text-align: center; margin-right: 10px;"> <tr> <td style="width: 20px;">●</td> <td style="width: 20px;">●</td> <td style="width: 20px;">●</td> <td style="width: 20px;">●</td> <td style="width: 20px;">●</td> <td style="width: 20px;">●</td> <td style="width: 20px;">●</td> <td style="width: 20px;">●</td> <td style="width: 20px;">●</td> <td style="width: 20px;">●</td> </tr> <tr> <td colspan="5" style="border-top: 1px solid black;"></td> <td colspan="5" style="border-top: 1px solid black;"></td> </tr> </table> <div style="margin-left: 10px;"> <p>Calculations</p> $\begin{array}{r} 146 \\ + 527 \\ \hline \end{array}$ </div> </div>		Tens	Units	39			15				5	4	●	●	●	●	●	●	●	●	●	●											<table border="1" style="border-collapse: collapse; text-align: center; margin: 10px auto;"> <tr> <td style="width: 50px;">●</td> <td style="width: 50px;">●</td> <td style="width: 50px;">●</td> <td style="width: 50px;">●</td> <td style="width: 50px;">●</td> <td style="width: 50px;">●</td> <td style="width: 50px;">●</td> <td style="width: 50px;">●</td> </tr> <tr> <td colspan="2" style="border-top: 1px solid black;">5</td> <td colspan="2" style="border-top: 1px solid black;">1</td> <td colspan="2" style="border-top: 1px solid black;">●</td> <td colspan="2" style="border-top: 1px solid black;">●</td> </tr> </table> <p>Children can draw a representation of the grid to further support their understanding, carrying the ten <u>underneath</u> the line</p>	●	●	●	●	●	●	●	●	5		1		●		●		$\begin{array}{r} 20 + 5 \\ 40 + 8 \\ \hline 60 + 13 = 73 \end{array}$ <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;"> <p>HTO</p> $\begin{array}{r} 48 \\ + 97 \\ \hline \end{array}$ </div> <div style="text-align: center;"> <p>HTO</p> $\begin{array}{r} 48 \\ + 97 \\ \hline \end{array}$ </div> </div> <div style="margin-top: 10px;"> <p>Use partitioning before formal exchange</p> </div>
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Years
4,5,6

Addition

Objective & Strategy	Concrete	Pictorial	Abstract
<p>Y4—add numbers with up to 4 digits</p>	<p>Children continue to use dienes or pv counters to add, exchanging ten ones for a ten and ten tens for a hundred and ten hundreds for a thousand.</p> 	 <p>Draw representations using pv grid.</p>	 <p>Continue from previous work to carry hundreds as well as tens.</p> <p>Relate to money and measures.</p>
<p>Y5—add numbers with more than 4 digits.</p> <p>Add decimals with 2 decimal places, including money.</p>	<p>As year 4</p>  <p>Introduce decimal place value counters and model exchange for addition.</p>		
<p>Y6—add several numbers of increasing complexity</p> <p>Including adding money, measure and decimals with different numbers of decimal points.</p>	<p>As Y5</p>	<p>As Y5</p> 	<p>It is important that you emphasise where to place the exchange to ensure that children have a good knowledge of place value.</p> 

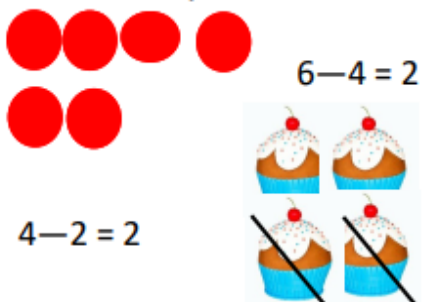
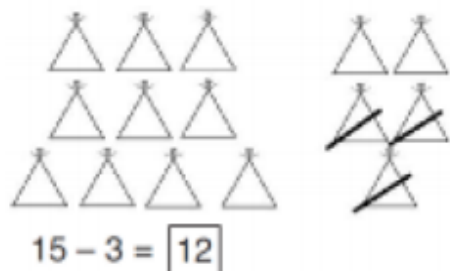
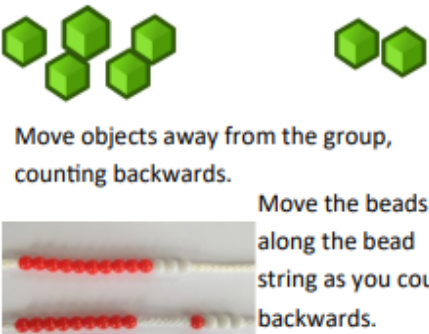
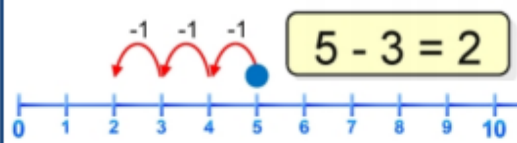
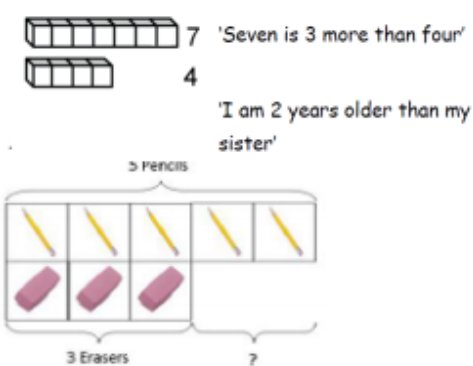
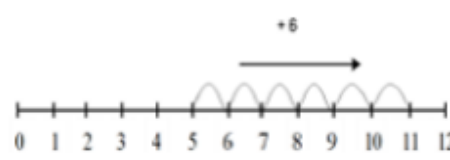
Subtraction Language

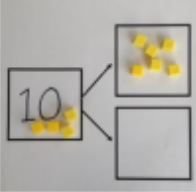
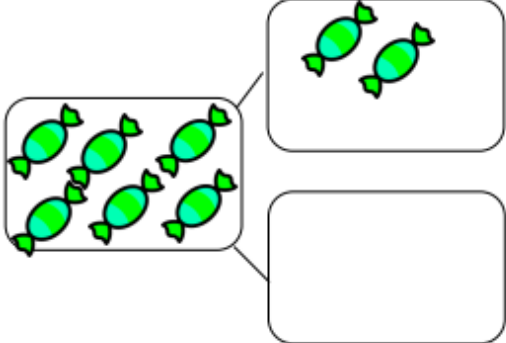


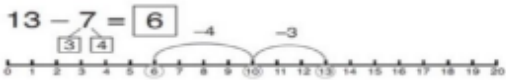



Year 1	-, subtract, take (away), minus, how many are left/left over? How many have gone? One less, two less, ten less...how many fewer is... than...? How much less is...? Difference between, half, halve =, equals, sign, is the same as, is of equal value to.
Year 2	Subtract, subtraction, take (away), minus, How many are left/left over? One less, two less... ten less... one hundred less, how many fewer is... than...? How much less is...? Difference between, half, halve, equals, sign, is the same as, exchange, trade, ones, tens.
Year 3	Subtract, subtraction, take (away), minus, how many are left/left over? One less, two less... ten less... one hundred less, how many fewer is... than...? How much less is...? Difference between, half, halve, equals, sign, is the same as, exchange, trade, hundreds, ones, tens.

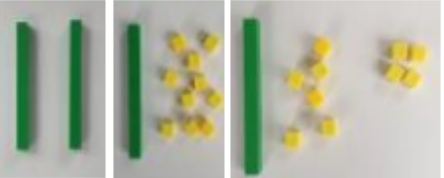
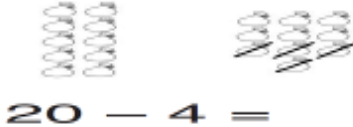

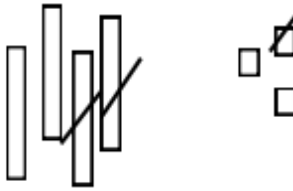
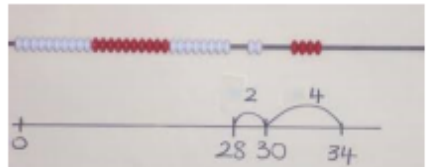
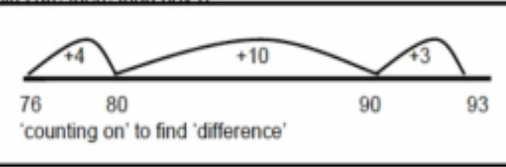
Maths Calculation Policy 2023-2024

Year 4, 5 & 6	Subtract, subtraction, take (away), minus, decrease, inverse, how many are left/left over? One less, two less... ten less... one hundred less, how many fewer is... than...? How much less is...? Difference between, half, halve, equals, sign, is the same as, exchange, trade, thousands, hundreds, ones, tens, decimal.
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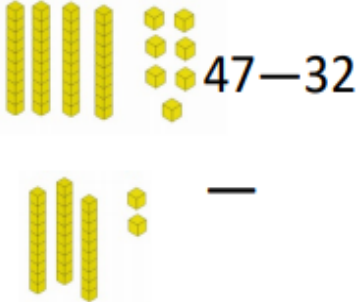
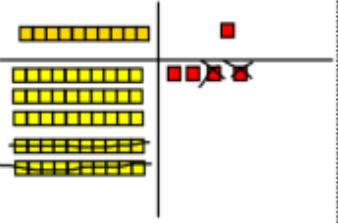
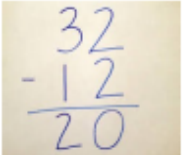
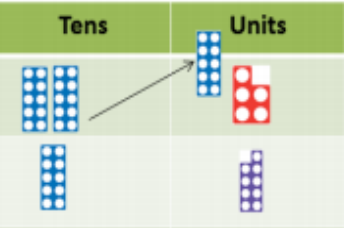

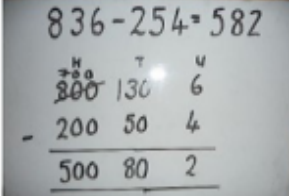
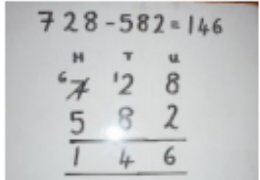
Maths Calculation Policy 2023-2024

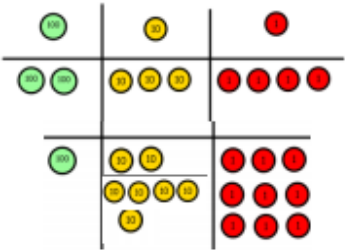
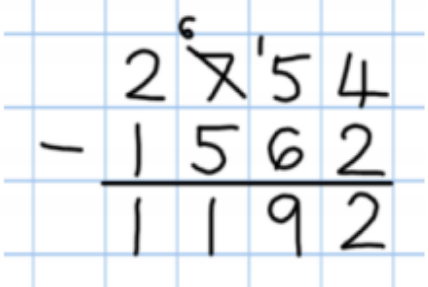
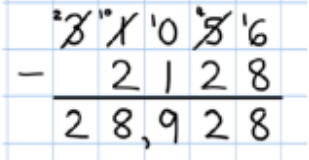
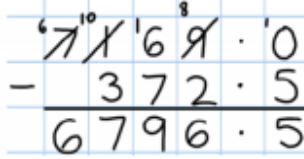
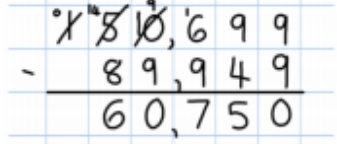
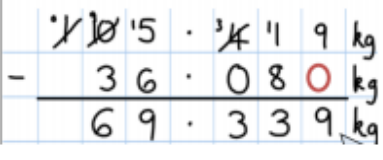
Objective & Strategy	Concrete	Pictorial	Abstract
Taking away ones.	<p>Use physical objects, counters, cubes etc to show how objects can be taken away.</p>  <p>$6 - 4 = 2$</p> <p>$4 - 2 = 2$</p>	 <p>$15 - 3 = 12$</p> <p>Cross out drawn objects to show what has been taken away.</p>	<p>$7 - 4 = 3$</p> <p>$16 - 9 = 7$</p>
Counting back	 <p>Move objects away from the group, counting backwards.</p> <p>Move the beads along the bead string as you count backwards.</p>	 <p>$5 - 3 = 2$</p> <p>Count back in ones using a number line.</p>	<p>Put 13 in your head, count back 4. What number are you at?</p>
Find the Difference	<p>Compare objects and amounts</p>  <p>'Seven is 3 more than four'</p> <p>'I am 2 years older than my sister'</p> <p>5 Pencils</p> <p>3 Erasers</p> <p>Lay objects to represent bar model.</p>	<p>Count on using a number line to find the difference.</p>  <p>+6</p>	<p>Hannah has 12 sweets and her sister has 5. How many more does Hannah have than her sister.?</p>

Objective & Strategy	Concrete	Pictorial	Abstract
<p>Represent and use number bonds and related subtraction facts within 20</p> <p>Part Part Whole model</p>	 <p>Link to addition. Use PPW model to model the inverse.</p> <p>If 10 is the whole and 6 is one of the parts, what is the other part?</p> $10 - 6 = 4$	 <p>Use pictorial representations to show the part.</p>	<p>Move to using numbers within the part whole model.</p> 
<p>Make 10</p>	<p>14 - 9</p>  <p>Make 14 on the ten frame. Take 4 away to make ten, then take one more away so that you have taken 5.</p>	<p>13 - 7</p>  <p>Jump back 3 first, then another 4. Use ten as the stopping point.</p>	<p>16 - 8</p> <p>How many do we take off first to get to 10? How many left to take off?</p>
<p>Bar model</p>	 $5 - 2 = 3$		 $10 = 8 + 2$ $10 = 2 + 8$ $10 - 2 = 8$ $10 - 8 = 2$

Objective & Strategy	Concrete	Pictorial	Abstract
Regroup a ten into ten ones	 <p>Use a PV chart to show how to change a ten into ten ones, use the term 'take and make'</p>	 $20 - 4 =$	$20 - 4 = 16$
Partitioning to subtract without regrouping. <i>'Friendly numbers'</i>	$34 - 13 = 21$  <p>Use Dienes to show how to partition the number when subtracting without regrouping.</p>	Children draw representations of Dienes and cross off.  $43 - 21 = 22$	$43 - 21 = 22$
Make ten strategy <i>Progression should be crossing one ten, crossing more than one ten, crossing the hundreds.</i>	 $34 - 28$ <p>Use a bead bar or bead strings to model counting to next ten and the rest.</p>	 <p>Use a number line to count on to next ten and then the rest.</p>	$93 - 76 = 17$

Subtraction

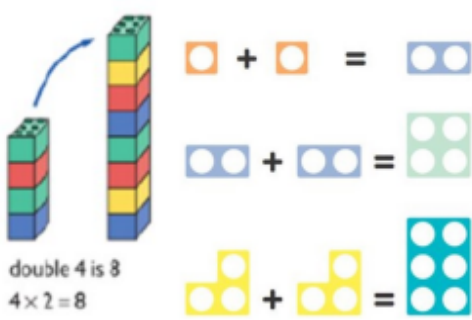

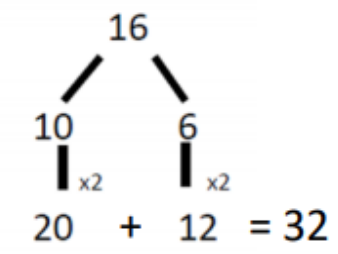
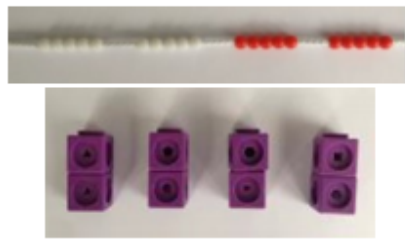
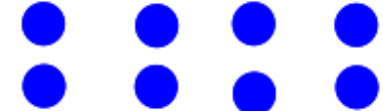
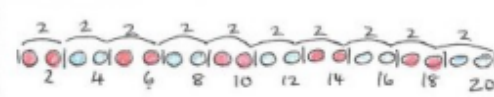
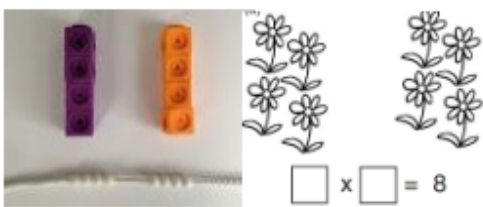

Objective & Strategy	Concrete	Pictorial	Abstract
<p>Column subtraction without regrouping (friendly numbers)</p>	 <p>47 - 32</p> <p>Use base 10 or Numicon to model</p>	 <p>Calculations</p> $\begin{array}{r} 54 \\ - 22 \\ \hline 32 \end{array}$ <p>Draw representations to support understanding</p>	$47 - 24 = 23$ $\begin{array}{r} 40 + 7 \\ - 20 + 4 \\ \hline 20 + 3 \end{array}$ <p>Intermediate step may be needed to lead to clear subtraction understanding.</p> 
<p>Column subtraction with regrouping</p>	 <p>Begin with base 10 or Numicon. Move to pv counters, modelling the exchange of a ten into ten ones. Use the phrase 'take and make' for exchange.</p>	$\begin{array}{r} 45 \\ - 29 \\ \hline 16 \end{array}$ <p>Tens Ones</p>  $\begin{array}{l} \square = 10 \\ \square \square = 10 \\ 10 + 6 = 16 \end{array}$ <p>Children may draw base ten or PV counters and cross off.</p>	 <p>Begin by partitioning into pv columns</p>  <p>Then move to formal method.</p>

Objective & Strategy	Concrete	Pictorial	Abstract
<p>Subtracting tens and ones</p> <p>Year 4 subtract with up to 4 digits.</p> <p><i>Introduce decimal subtraction through context of money</i></p>	<p>234 - 179</p>  <p>Model process of exchange using Numicon, base ten and then move to PV counters.</p>	<p>Children to draw pv counters and show their exchange—see Y3</p>	 <p>Use the phrase 'take and make' for exchange</p>
<p>Year 5- Subtract with at least 4 digits, including money and measures.</p> <p><i>Subtract with decimal values, including mixtures of integers and decimals and aligning the decimal</i></p>	<p>As Year 4</p>	<p>Children to draw pv counters and show their exchange—see Y3</p> <p>Avoid using phrases such as 'borrow one'</p> <p>Let's start with the smallest place value</p> <p>Can we make an exchange?</p> <p>Where do we record this?</p> <p>T H T O 1504 - 275 -----</p>	 <p>Use zeros for place-holders.</p> 
<p>Year 6—Subtract with increasingly large and more complex numbers and decimal values.</p>			 

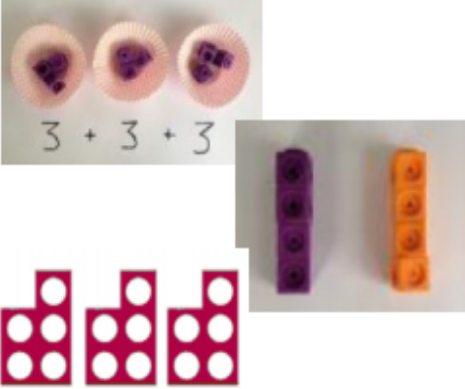
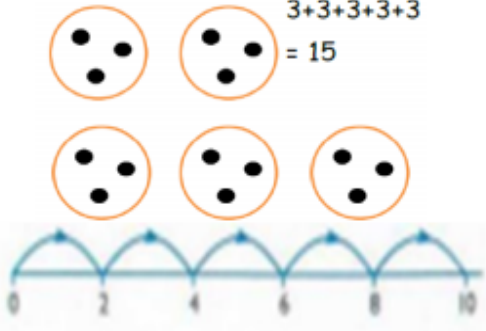

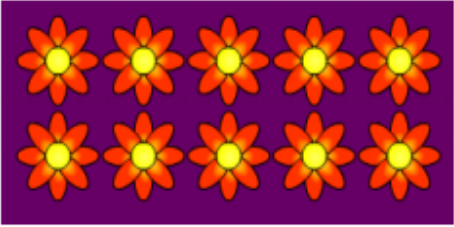
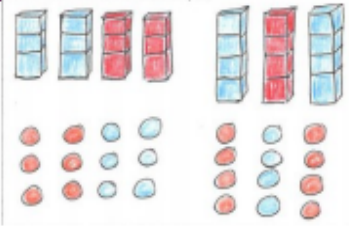
Maths Calculation Policy 2023-2024

Multiplication Language

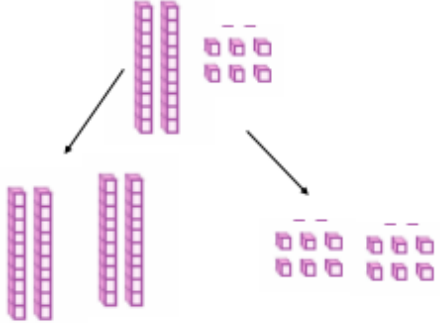
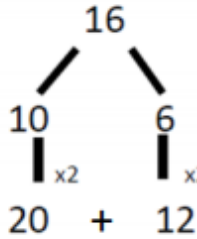
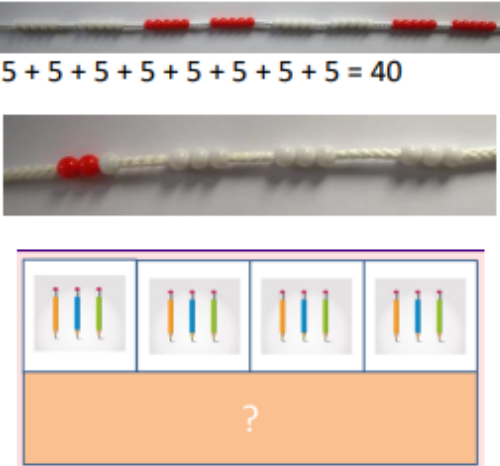
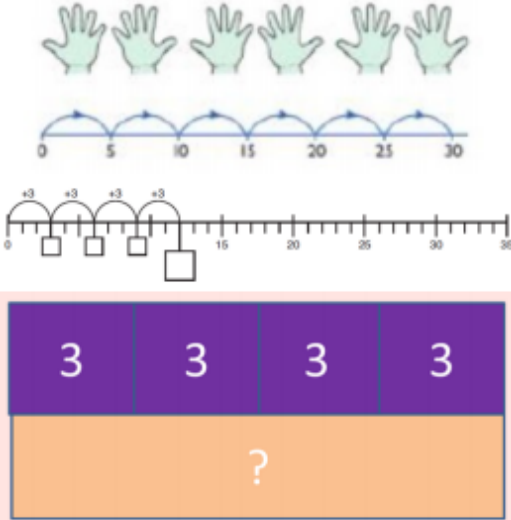
Year 1	double, groups of, near double, equals, sign, is the same as
Year 2	lots of, groups of, x times, multiply, multiplied by, multiple of, once, twice, three times... ten times..., times as (big, long, wide... and so on), repeated addition, array, row, column, double.
Year 3	lots of, groups of, x, times, multiply, multiplication, multiplied by, multiple of, product, once, twice, three times... ten times..., times as (big, long, wide... and so on), repeated addition, array, row, column, double,
Year 4 & 5	lots of, groups of, times, multiply, multiplication, multiplied by, multiple of, product, once, twice, three times... ten times..., times as (big, long, wide... and so on), repeated addition, array, row, column, double, factor, quotient, divisible by, inverse
Year 6	Halve, share, share equally, one each, two each, three each..., group in pairs, threes... tens, equal groups of, divide, division, divided by, divided into, remainder, factor, quotient, divisible by, inverse

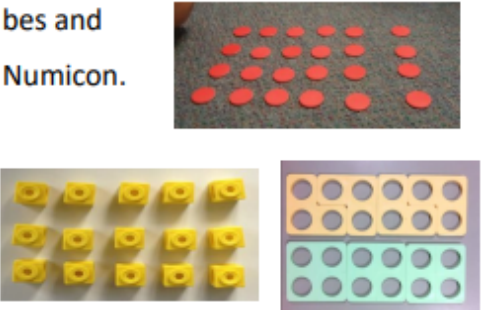
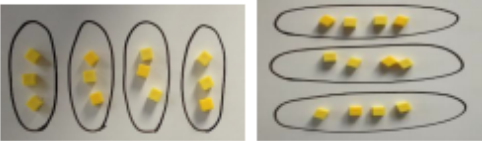
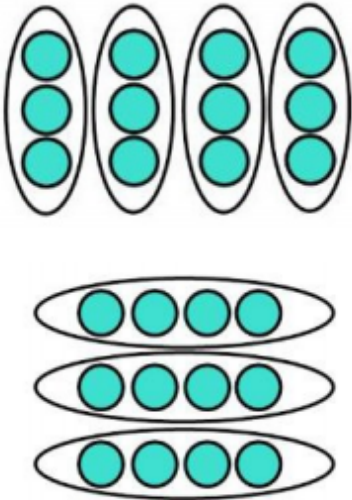


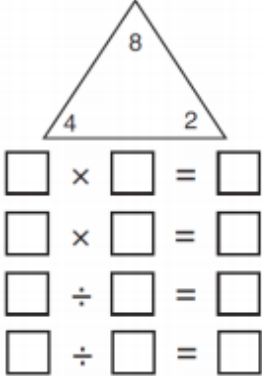
Objective & Strategy	Concrete	Pictorial	Abstract
<p>Doubling</p>	<p>Use practical activities using manipulatives including cubes and Numicon to demonstrate doubling</p>  <p>double 4 is 8 $4 \times 2 = 8$</p>	<p>Draw pictures to show how to double numbers</p> <p>Double 4 is 8</p> 	<p>Partition a number and then double each part before recombining it back together.</p> 
<p>Counting in multiples</p>	<p>Count the groups as children are skip counting, children may use their fingers as they are skip counting.</p> 	 <p>Children make representations to show counting in multiples.</p> 	<p>Count in multiples of a number aloud.</p> <p>Write sequences with multiples of numbers.</p> <p>2, 4, 6, 8, 10</p> <p>5, 10, 15, 20, 25, 30</p>
<p>Making equal groups and counting the total</p>	 <p>Use manipulatives to create equal groups.</p> <p>$\square \times \square = 8$</p>	<p>Draw  to show $2 \times 3 = 6$</p> <p>Draw and make representations</p>	<p>$2 \times 4 = 8$</p>

Multiplication

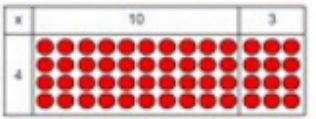
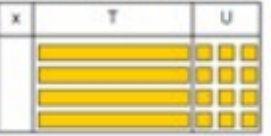

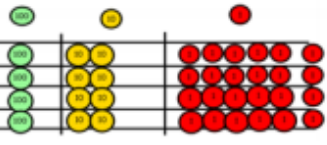
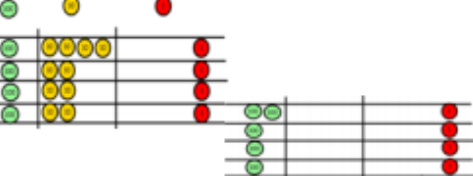
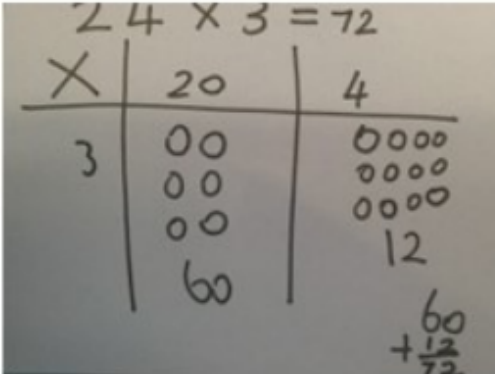
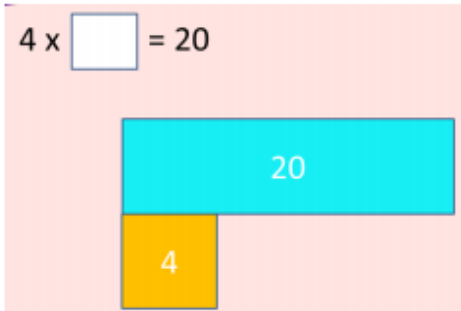
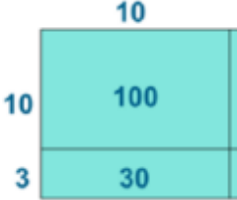
Objective & Strategy	Concrete	Pictorial	Abstract
Repeated addition	 <p>Use different objects to add equal groups</p>	<p>Use pictorial including number lines to solve prob There are 3 sweets in one bag. How many sweets are in 5 bags altogether?</p> 	<p>Write addition sentences to describe objects and pictures.</p> 
Understanding arrays	<p>Use objects laid out in arrays to find the answers to 2 lots 5, 3 lots of 2 etc.</p> 	<p>Draw representations of arrays to show understanding</p> 	<p>$3 \times 2 = 6$</p> <p>$2 \times 5 = 10$</p>

Multiplication


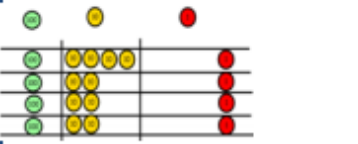
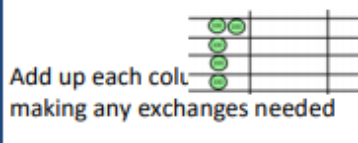
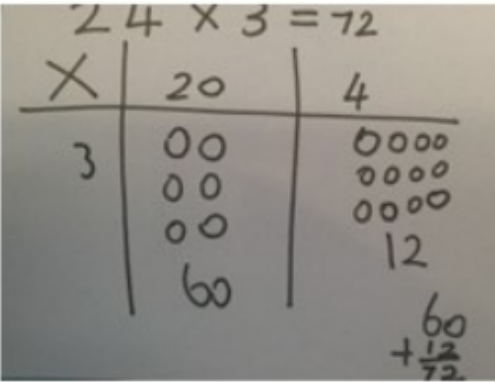
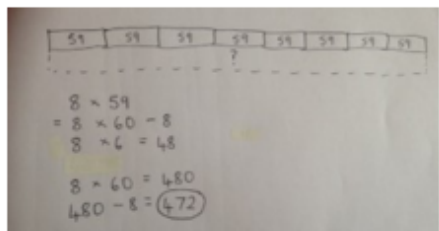
Objective & Strategy	Concrete	Pictorial	Abstract
<p>Doubling</p>	<p>Model doubling using dienes and PV counters.</p>  <p>$40 + 12 = 52$</p>	<p>Draw pictures and representations to show how to double numbers</p>	<p>Partition a number and then each part before recombining together.</p> 
<p>Counting in multiples of 2, 3, 4, 5, 10 from 0 (repeated addition)</p>	<p>Count the groups as children are skip counting, children may use their fingers as they are skip counting. Use bar models.</p>  <p>$5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 = 40$</p>	<p>Number lines, counting sticks and bar models should be used to show representation of counting in multiples.</p> 	<p>Count in multiples of a number</p> <p>Write sequences with multiplication numbers.</p> <p>0, 2, 4, 6, 8, 10</p> <p>0, 3, 6, 9, 12, 15</p> <p>0, 5, 10, 15, 20, 25, 30</p> <p>$4 \times 3 = [$</p>

Objective & Strategy	Concrete	Pictorial	Abstract
<p>Multiplication is commutative</p>	<p>Create arrays using counters and cubes and Numicon.</p>  <p>Pupils should understand that an array can represent different equations and that, as multiplication is commutative, the order of the multiplication does not affect the answer.</p> 	<p>Use representations of arrays to show different calculations and explore commutativity.</p> 	<p>$12 = 3 \times 4$</p> <p>$12 = 4 \times 3$</p> <div style="border: 1px solid black; padding: 5px;"> <p>Use an array to write multiplication sentences and reinforce repeated addition.</p>  <p>$5 + 5 + 5 = 15$</p> <p>$3 + 3 + 3 + 3 + 3 = 15$</p> <p>$5 \times 3 = 15$</p> <p>$3 \times 5 = 15$</p> </div>
<p>Using the Inverse</p> <p><i>This should be taught alongside division, so pupils learn how they work alongside each other.</i></p>		 <p>$\square \times \square = \square$</p> <p>$\square \times \square = \square$</p> <p>$\square \div \square = \square$</p> <p>$\square \div \square = \square$</p>	<p>$2 \times 4 = 8$</p> <p>$4 \times 2 = 8$</p> <p>$8 \div 2 = 4$</p> <p>$8 \div 4 = 2$</p> <p>$8 = 2 \times 4$</p> <p>$8 = 4 \times 2$</p> <p>$2 = 8 \div 4$</p> <p>$4 = 8 \div 2$</p> <p>Show all 8 related fact family sentences.</p>

Multiplication

Objective & Strategy	Concrete	Pictorial	Abstract						
<p>Grid method</p>	<p>Show the links with arrays to first introduce the grid method.</p>  <p>4 rows of 10 4 rows of 3</p> <p>Move onto base ten to move towards a more compact method.</p>  <p>4 rows of 13</p> <p>Move on to place value counters to show how we are finding groups of a number. We are multiplying by 4 so we need 4 rows</p>  <p>Calculations 4×126</p> <p>Fill each row with 126</p>  <p>Calculations 4×126</p> <p>Add up each column, starting with the ones making any exchanges needed</p>  <p>Then you have your answer.</p>	<p>Children can represent their work with place value counters in a way that they understand.</p> <p>They can draw the counters using colours to show different amounts or just use the circles in the different columns to show their thinking as shown below.</p>  <p>Bar model are used to explore missing numbers</p> 	<p>Start with multiplying by one digit and showing the clear add alongside the grid.</p> <table border="1" data-bbox="1523 406 1780 502"> <tr> <td>x</td> <td>30</td> <td></td> </tr> <tr> <td>7</td> <td>210</td> <td></td> </tr> </table> <p>$210 + 35 = 245$</p> <p>Moving forward, multiply by a 2 showing the different rows with method.</p> 	x	30		7	210	
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Multiplication

Objective & Strategy	Concrete	Pictorial	Abstract																																													
<p>Grid method recap from year 3 for 2 digits x 1 digit</p> <p>Move to multiplying 3 digit numbers by 1 digit. (year 4 expectation)</p>	<p>Use place value counters to show how we are finding groups of a number. We are multiplying by 4 so we need 4 rows</p>  <p>Calculations 4 x 126</p> <p>Fill each row with 126</p>  <p>Add up each column making any exchanges needed</p> 	<p>Children can represent their work with place value counters in a way that they understand.</p> <p>They can draw the counters using colours to show different amounts or just use the circles in the different columns to show their thinking as shown below.</p> 	<p>Start with multiplying by one digit and showing the clear add alongside the grid.</p> <table border="1" data-bbox="1523 399 1769 502"> <tr> <td>x</td> <td>30</td> </tr> <tr> <td>7</td> <td>210</td> </tr> </table> <p>210 + 30 = 240</p>	x	30	7	210																																									
x	30																																															
7	210																																															
<p>Column multiplication</p>	<p>Children can continue to be supported by place value counters at the stage of multiplication. This initially done where there is no regrouping. 321 x 2 = 642</p> <table border="1" data-bbox="383 1037 716 1436"> <thead> <tr> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>It is important at this stage that they always multiply the ones first.</p> <p>The corresponding long multiplication is modelled alongside</p>	Hundreds	Tens	Ones													<table border="1" data-bbox="985 925 1344 1013"> <tr> <td>x</td> <td>300</td> <td>20</td> <td>7</td> </tr> <tr> <td>4</td> <td>1200</td> <td>80</td> <td>28</td> </tr> </table> <p>The grid method may be used to show how this relates to a formal written method.</p>  <p>Bar modelling and number lines can support learners when solving problems with multiplication alongside the formal written methods.</p>	x	300	20	7	4	1200	80	28	<table data-bbox="1590 901 1769 1300"> <tr> <td>327</td> </tr> <tr> <td>x 4</td> </tr> <tr> <td>28</td> </tr> <tr> <td>80</td> </tr> <tr> <td>1200</td> </tr> <tr> <td>1308</td> </tr> </table> <p>This to a method</p> <table border="1" data-bbox="1467 1316 1713 1476"> <tr> <td></td> <td>3</td> <td>2</td> <td>7</td> </tr> <tr> <td>x</td> <td>1</td> <td>2</td> <td>4</td> </tr> <tr> <td></td> <td>1</td> <td>3</td> <td>0</td> </tr> <tr> <td></td> <td></td> <td></td> <td>8</td> </tr> </table>	327	x 4	28	80	1200	1308		3	2	7	x	1	2	4		1	3	0				8
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Multiplication

Objective & Strategy	Concrete	Pictorial	Abstract																																																									
<p>Column Multiplication for 3 and 4 digits x 1 digit.</p>	<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="background-color: red; color: white;">Hundreds</td> <td style="background-color: green; color: white;">Tens</td> <td style="background-color: blue; color: white;">Ones</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table> <p>It is important at this stage that they always multiply the ones first.</p> <p>Children can continue to be supported by place value counters at the stage of multiplication. This initially done where there is no regrouping. $321 \times 2 = 642$</p>	Hundreds	Tens	Ones													<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>x</td> <td>300</td> <td>20</td> <td>7</td> </tr> <tr> <td>4</td> <td>1200</td> <td>80</td> <td>28</td> </tr> </table> <p style="text-align: center; color: red; font-size: 2em;">➔</p>	x	300	20	7	4	1200	80	28	$\begin{array}{r} 327 \\ \times 4 \\ \hline 28 \\ 80 \\ \hline 1200 \\ \hline 1308 \end{array}$ <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>3</td><td>2</td><td>7</td></tr> <tr><td>x</td><td></td><td>4</td></tr> <tr><td colspan="3"><hr/></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> </table> <p style="text-align: right; font-size: 0.8em;">T a n</p>	3	2	7	x		4	<hr/>																											
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3	2	7																																																										
x		4																																																										
<hr/>																																																												
<p>Column multiplication</p>	<p>Manipulatives may still be used with the corresponding long multiplication modelled alongside.</p>	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td style="background-color: orange;">10</td> <td style="background-color: orange;">8</td> </tr> <tr> <td style="background-color: orange;">10</td> <td style="background-color: orange;">100</td> <td style="background-color: orange;">80</td> </tr> <tr> <td style="background-color: orange;">3</td> <td style="background-color: orange;">30</td> <td style="background-color: orange;">24</td> </tr> </table> <p style="text-align: center; color: red; font-size: 2em;">➔</p>		10	8	10	100	80	3	30	24	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td></td><td></td><td>5</td><td>4</td></tr> <tr><td></td><td></td><td>2</td><td></td></tr> <tr><td>1</td><td>8</td><td>0</td><td></td></tr> <tr><td>2</td><td>3</td><td>4</td><td></td></tr> </table> <p style="font-size: 0.8em;">18 x first (8 x ing l ther 18 x 2nd</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>x</td><td></td><td>1</td><td>6</td></tr> <tr><td colspan="4"><hr/></td></tr> <tr><td>7</td><td>4</td><td>0</td><td>4</td></tr> <tr><td colspan="4"><hr/></td></tr> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td colspan="4"><hr/></td></tr> <tr><td>1</td><td>9</td><td>7</td><td>4</td></tr> </table> <p style="font-size: 0.8em;">(1234 x 6) (1234 x 10)</p> <p>Continue to use bar modelling to support problem solving</p>			5	4			2		1	8	0		2	3	4		1	2	3	4	x		1	6	<hr/>				7	4	0	4	<hr/>				1	2	3	4	<hr/>				1	9	7	4
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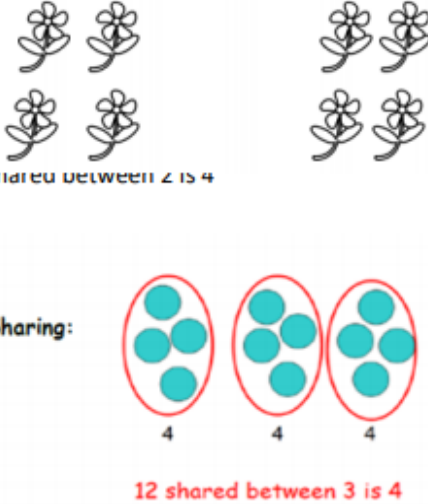
Multiplication

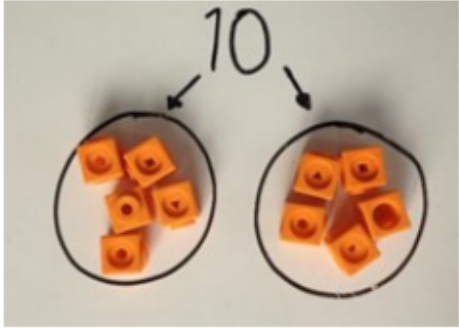
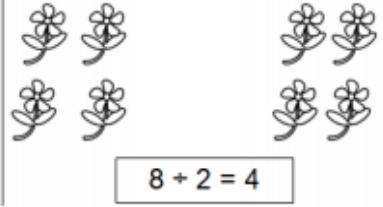
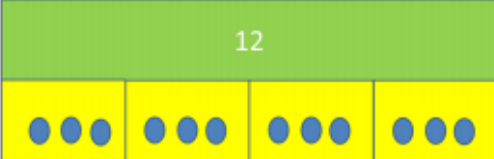
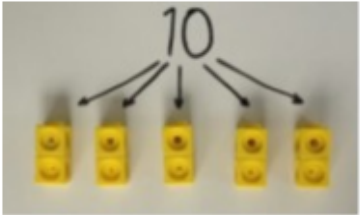

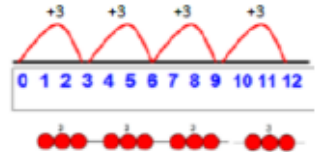
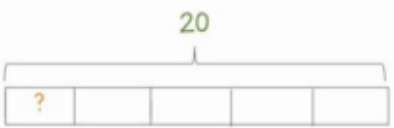
Objective & Strategy	Concrete	Pictorial	Abstract
Multiplying decimals up to 2 decimal places by a single digit.			Remind children that the single digit is in the units column. Line up the points in the question and the : $ \begin{array}{r} ^2 ^3 ^1 \\ 1342 \\ \times 18 \\ \hline 13420 \\ 10736 \\ \hline 24156 \\ ^1 \end{array} $

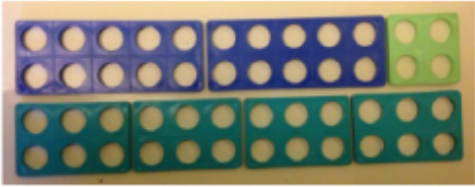



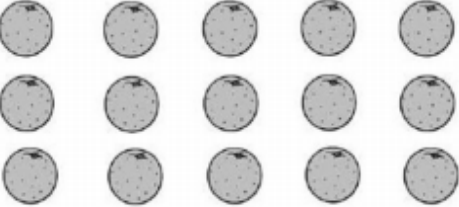
Maths Calculation Policy 2023-2024

Division Language

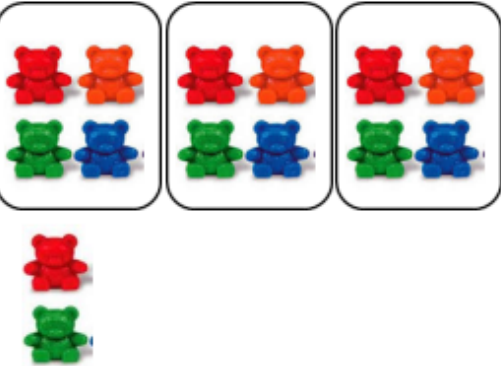


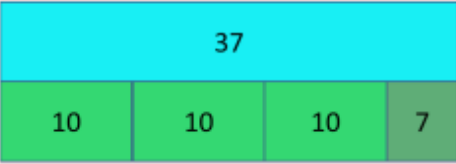
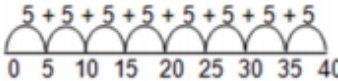
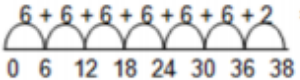
Year 1	Halve, share equally, one each, two each, three each...group in pairs, threes... tens equal groups of, \div , divide, divided by, divided into, left, left over, how many groups of
Year 2	Halve, share equally, one each, two each, three each...group in pairs, threes... tens equal groups of, \div , divide, divided by, divided into, left, left over, how many groups of
Year 3	Halve, group, group equally, one each, two each, three each..., group in pairs, threes... tens, equal groups of, \div divide, division, divided by, divided into, left, left over, remainder
Year 4	Halve, group, group equally, one each, two each, three each..., group in pairs, threes... tens equal groups of, divide, division, divided by, divided into, remainder, factor, quotient, divisible by inverse
Year 5 & 6	Halve, group, group equally, one each, two each, three each..., group in pairs, threes... tens equal groups of, divide, division, divided by, divided into, remainder, short division, factor, quotient, divisible by, inverse

Objective & Strategy	Concrete	Pictorial	Abstract
<p>Division as sharing</p> <p><i>Use Gordon ITPs for modelling</i></p>	 <p>I have 10 cubes, can you share them equally in 2 groups?</p>	<p>Children use pictures or shapes to share quantities.</p> 	<p>12 shared between 3 is 4</p> <p>4</p>

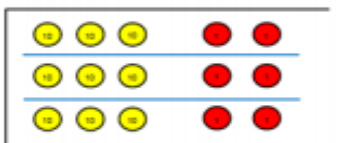


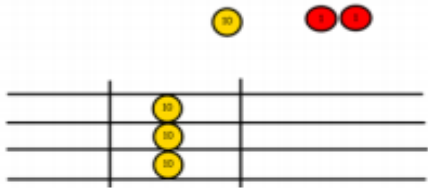
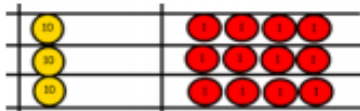
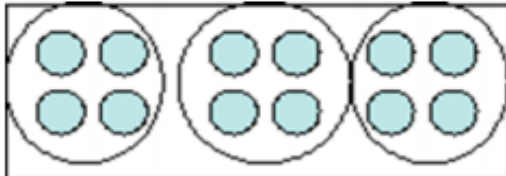
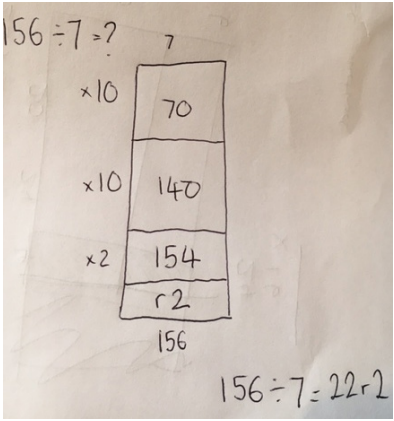
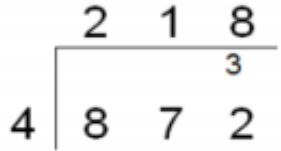
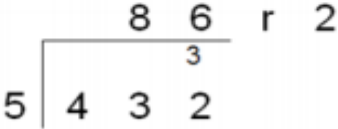
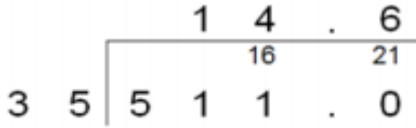
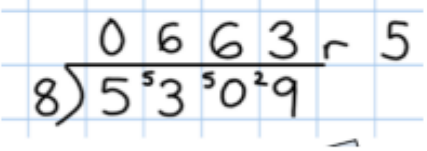
Objective & Strategy	Concrete	Pictorial	Abstract
<p>Division as sharing</p>	 <p>I have 10 cubes, can you share them equally in 2 groups?</p>	<p>Children use pictures or shapes to share quantities.</p>  <p>$8 \div 2 = 4$</p> <p>Children use bar modelling to show and support understanding.</p>  <p>$12 \div 4 = 3$</p>	<p>$12 \div 3 = 4$</p>
<p>Division as grouping</p>	<p>Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding.</p>  	<p>Use number lines for grouping</p>  <p>$12 \div 3 = 4$</p> <p>Think of the bar as a whole. Split it into the number of groups you are dividing by and work out how many would be within each group.</p>  <p>$20 \div 5 = ?$ $5 \times ? = 20$</p>	<p>$28 \div 7 = 4$</p> <p>Divide 28 into 7 groups. How many are in each group?</p>

Objective & Strategy	Concrete	Pictorial	Abstract
<p>Division as grouping</p>	<p>Use cubes, counters, objects or place value counters to aid understanding.</p>  <p>24 divided into groups of 6 = 4</p> $96 \div 3 = 32$ 	<p>Continue to use bar modelling to aid solving division problems.</p>  $20 \div 5 = ?$ $5 \times ? = 20$	<p>How many groups of 6 in 24?</p> $24 \div 6 = 4$
<p>Division with arrays</p>	 <p>Link division to multiplication by creating an array and thinking about the number sentences that can be created.</p> <p>Eg $15 \div 3 = 5$ $5 \times 3 = 15$ $15 \div 5 = 3$ $3 \times 5 = 15$</p>	<p>Draw an array and use lines to split the array into groups to make multiplication and division sentences</p> 	<p>Find the inverse of multiplication and division sentences by creating eight linking number sentences.</p> $7 \times 4 = 28$ $4 \times 7 = 28$ $28 \div 7 = 4$ $28 \div 4 = 7$ $28 = 7 \times 4$ $28 = 4 \times 7$ $4 = 28 \div 7$ $7 = 28 \div 4$

Division

Objective & Strategy	Concrete	Pictorial	Abstract
<p>Division with remainders.</p>	<p>$14 \div 3 =$</p> <p>Divide objects between groups and see how much is left over</p> 	<p>Jump forward in equal jumps on a number line then see how many more you need to jump to find a remainder.</p>  <p>Draw dots and group them to divide an amount and clearly show a remainder.</p>  <p>Use bar models to show division with remainders.</p>  <p>Example without remainder: $40 \div 5$ Ask "How many 5s in 40?" $5 + 5 + 5 + 5 + 5 + 5 + 5 = 8 \text{ fives}$</p>  <p>Example with remainder: $38 \div 6$</p>  <p>For larger numbers, when it becomes inefficient to count in single multiples, bigger jumps can be recorded using known facts.</p>	<p>Complete written divisions and mainer using r.</p> $29 \div 8 = 3 \text{ REMAIND}$ <p style="text-align: center;"> ↑ ↑ ↑ dividend divisor quotient </p>

Division

Objective & Strategy	Concrete	Pictorial	Abstract
<p>Divide at least 3 digit numbers by 1 digit.</p> <p>Short Division</p>	<p>$96 \div 3$</p> <p>Tens Units</p> <p>3 2</p>  <p>Use place value counters to divide using the bus stop method alongside</p>  <p>Calculations $42 \div 3$</p>  <p>$42 \div 3 =$</p> <p>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.</p>  <p>We exchange this ten for ten ones and then share the ones equally among the groups.</p>  <p>We look how much in 1 group so the answer is 14.</p>	<p>Students can continue to use drawn diagrams with dots or circles to help them divide numbers into equal groups.</p>  <p>Encourage them to move towards counting in multiples to divide more efficiently.</p>  <p>$156 \div 7 = 22r2$</p>	<p>Begin with divisions that divide equally with no remainder.</p>  <p>Move onto divisions with a remainder.</p>  <p>Finally move into decimal places to divide the total accurately.</p>  

Long Division

Step 1—a remainder in the ones

$$\begin{array}{r} \text{h t o} \\ 041\text{R}1 \\ \hline 4 \overline{) 165} \end{array}$$

4 does not go into 1 (hundred). So combine the 1 hundred with the 6 tens (160).

4 goes into 16 four times.

4 goes into 5 once, leaving a remainder of 1.

$$\begin{array}{r} \text{th h t o} \\ 0400\text{R}7 \\ \hline 8 \overline{) 3207} \end{array}$$

8 does not go into 3 of the thousands. So combine the 3 thousands with the 2 hundreds (3,200).

8 goes into 32 four times ($3,200 \div 8 = 400$)

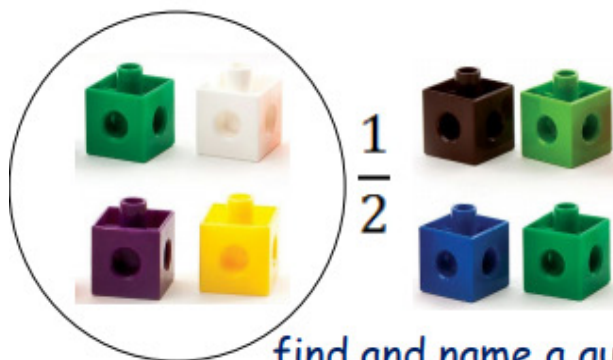
8 goes into 0 zero times (tens).

8 goes into 7 zero times, and leaves a remainder of 7.

Division

Recognise, find and name a half as one of two equal parts of an object, shape or quantity.

Concrete



$\frac{1}{2}$

Recognise, find and name a quarter as four equal parts of an object, shape or quantity.

Pictorial

A whole apple



1

Half an apple



$\frac{1}{2}$

Recognise, find and name a quarter as four equal parts of an object, shape or quantity.

Abstract

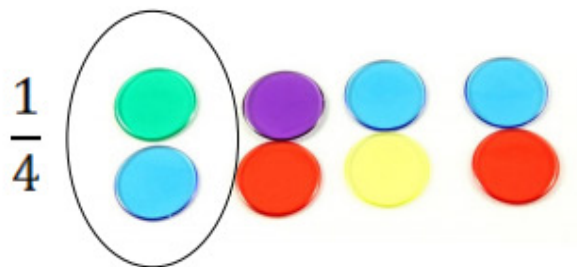
Half of 10 =

Half of 8 =

Half of 14 =

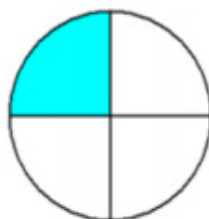
$\frac{1}{2}$

Concrete



$\frac{1}{4}$

Pictorial



$\frac{1}{4}$



Abstract

A quarter of 20 =

A quarter of 12 =

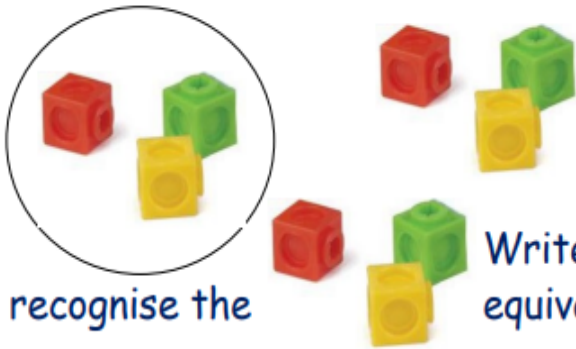
A quarter of 8 =

$\frac{1}{4}$

Fractions

Recognise, find and name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity.

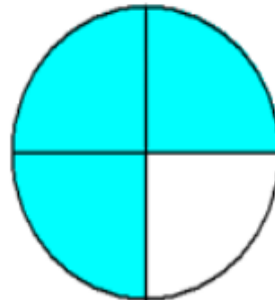
Concrete



and recognise the $\frac{1}{2}$.

Write simple equivalence

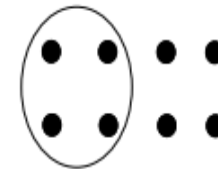
Pictorial



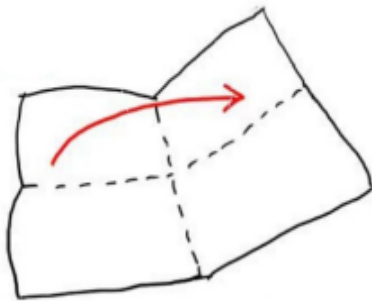
fractions of $\frac{2}{4}$ and

Abstract

$$\frac{2}{4} \text{ of } 8 = \square$$



Concrete



Pictorial



I have $\frac{1}{2}$ a pie You have $\frac{2}{4}$ of a pie

Abstract

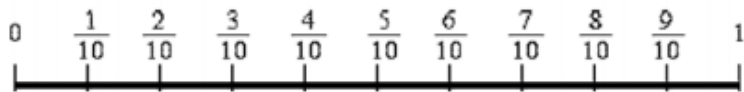
$$\frac{1}{2} \text{ of } 6 = \square$$



Fractions

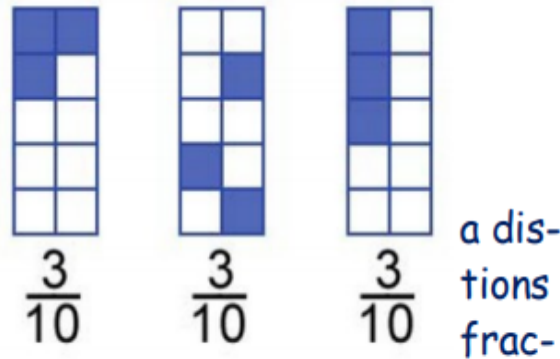
Count up and down in tenths: recognise that tenths arise from dividing an object into ten equal parts and in dividing one-digit numbers or quantities by ten.

Concrete



Recognise, find and write fractions of a concrete set of objects: unit fractions and non-unit fractions and use them as numbers.

Pictorial

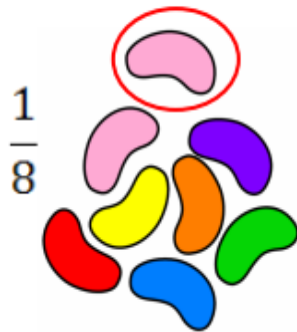


Abstract

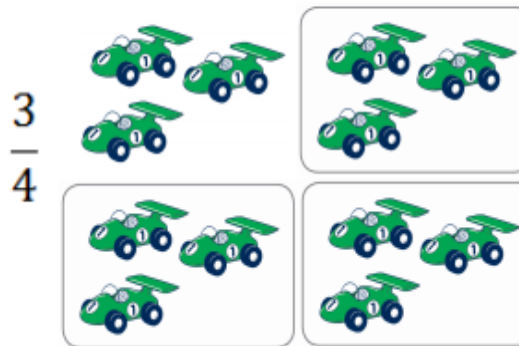
$\frac{1}{10}$ of 6 = 0.6
because
 $6 \div 10 = 0.6$

$\frac{1}{10}$ of 7 = 0.7
because
 $7 \div 10 = 0.7$

Concrete



Pictorial



Abstract

$\frac{1}{5}$ of 15 sweets = 3
because $15 \div 5 = 3$

$\frac{2}{5}$ of 15 sweets = 6
because $15 \div 5 = 3$ and $3 \times 2 = 6$

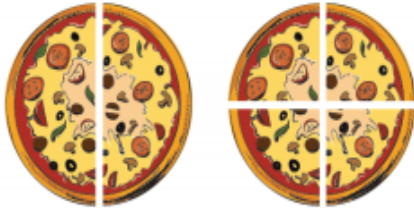
Fractions

Recognise and show, using diagrams, equivalent fractions with small denominators.

Year

3

Concrete

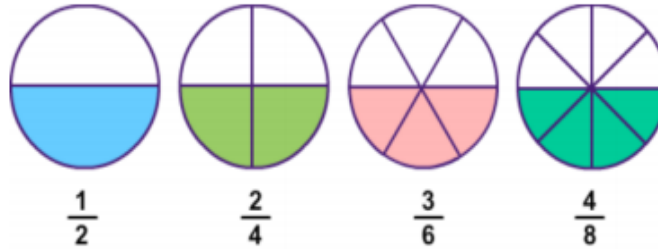


two halves
 $\frac{2}{2}$

four quarters
 $\frac{4}{4}$

Add
sub-

Pictorial



$\frac{1}{2}$

$\frac{2}{4}$

$\frac{3}{6}$

$\frac{4}{8}$

Abstract

Sam says that two quarters is the same as one half.

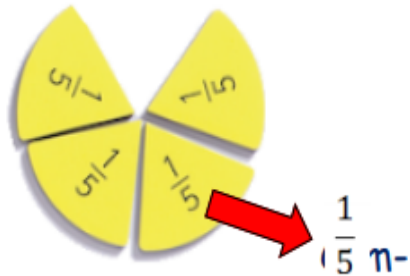
Is he correct?

How do you know?

and

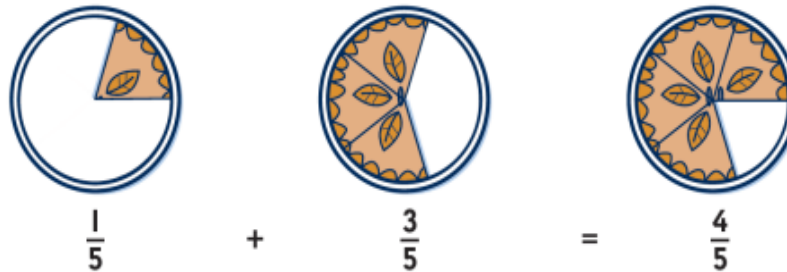
tract fractions with the same denominator.

Concrete



$\frac{1}{5} n-$

Pictorial



$\frac{1}{5}$

+

$\frac{3}{5}$

=

$\frac{4}{5}$

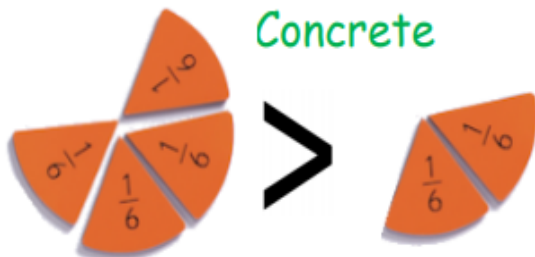
Abstract

$$\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$$

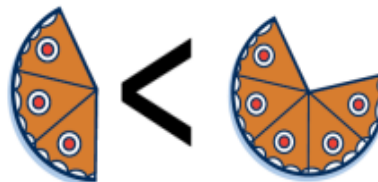
$$\frac{5}{8} - \frac{2}{8} = \frac{3}{8} \text{ pare with}$$

and order unit fractions
the same denominators.

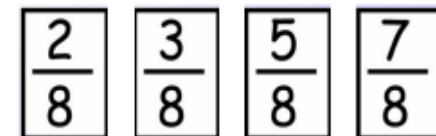
Concrete



Pictorial



Abstract



Fractions

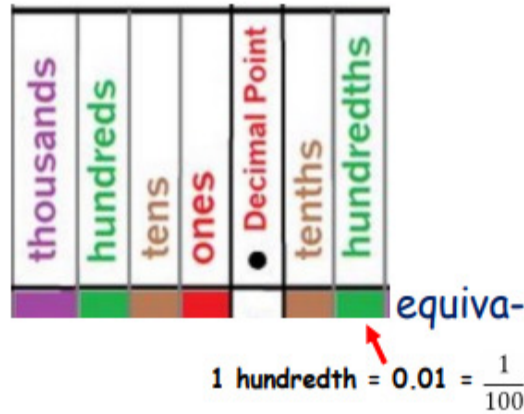
Count up and down in hundredths: recognise that hundredths arise when dividing an object and dividing tenths by 10.

Concrete



Recognise and write decimal equivalents to $\frac{3}{100}$, $\frac{1}{2}$, $\frac{1}{4}$, $\frac{7}{100}$ and $\frac{3}{4}$.

Pictorial



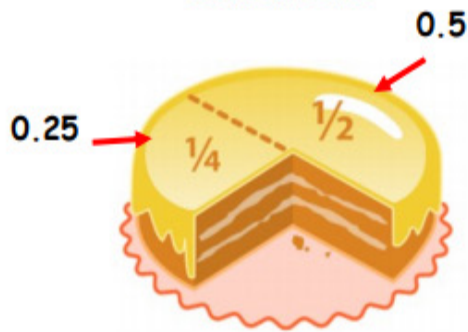
Abstract

$\frac{1}{100}$ of 60 = 0.6
because $60 \div 100 = 0.6$

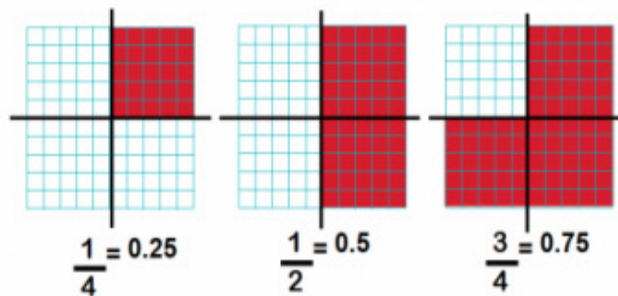
$\frac{1}{10}$ of 70 = 7
so $\frac{1}{100}$ of 70 = 0.7

Fractions

Concrete



Pictorial



Abstract

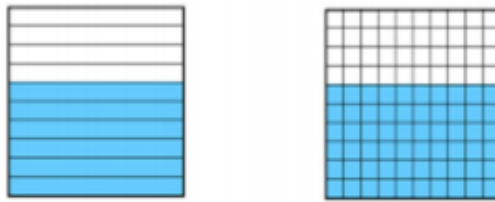
$\frac{1}{2} = 0.5$
 $\frac{1}{2} = 0.2$
 $\frac{1}{4} = 0.7$
 $\frac{3}{4}$

Concrete



Rec- $\frac{1}{10}$ of the chocolate bar = 0.1

Pictorial



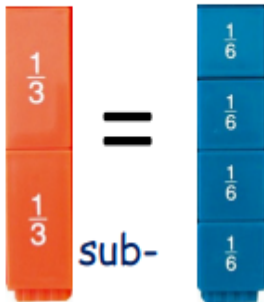
0.6
six tenths

0.60
sixty hundredths and show,
grams, families of common equivalents.

Abstract

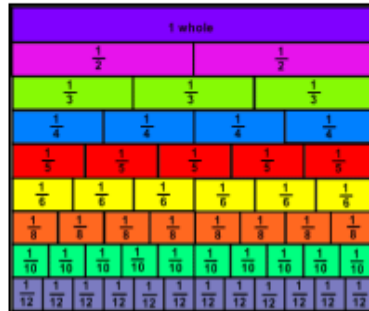
$\frac{1}{10} = 0.1$
 $\frac{3}{10} = 0.3$
 $\frac{5}{10} = \frac{1}{2} = 0.5$
 $\frac{8}{100} = 0.08$ using dia-

Concrete



Add and subtract fractions
nator.

Pictorial

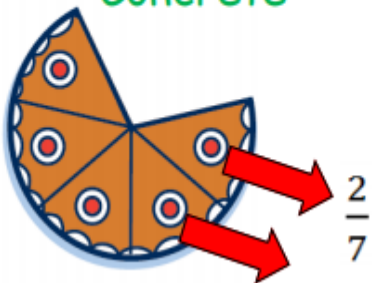


with the same

Abstract

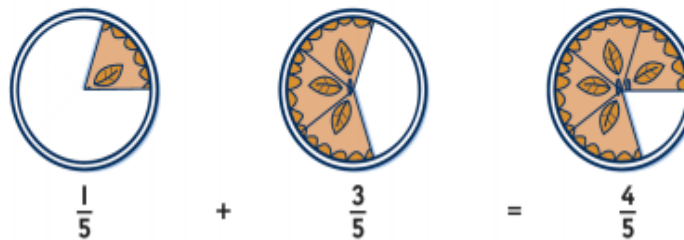
$\frac{2}{3} = \frac{4}{6}$
 $\frac{3}{5} = \frac{6}{10}$
 $\frac{2}{12} = \frac{1}{6}$ denomi-

Concrete



$\frac{2}{7}$

Pictorial



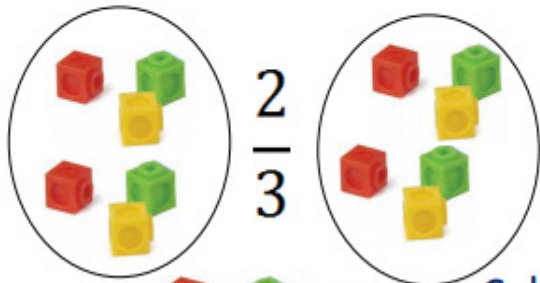
Sam eats $\frac{2}{7}$ of a whole pizza. How much does he have left?

Lucy and Ben both eat $\frac{3}{8}$ of a cake. How much have they eaten altogether?

Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number.

Year
r

Concrete



Pictorial



Abstract

$$\frac{2}{3} \text{ of } \pounds 18$$

$$\pounds 18 \div 3 = \pounds 6$$

$$\pounds 6 \times 2 = \pounds 12$$




two

Solve simple money problems involving fractions and decimals to two decimal places.

Concrete



Pictorial

U	.	t	h
Units	Decimal Point	Tenths	Hundredths
	■		

Abstract

$$100\text{cm} = 1\text{m}$$

$$50\text{cm} = \frac{1}{2} = 0.5\text{m}$$

$$25\text{cm} = \frac{1}{4} = 0.25\text{m}$$

$$10\text{cm} = \frac{1}{10} = 0.1\text{m}$$

$$30\text{cm} = \frac{3}{10} = 0.3\text{m}$$

Fractions

Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths.

Concrete

de- Compare and order
nominators are all multi-
same number.

Pictorial

$$\frac{6}{10} = \frac{60}{100}$$

fractions whose
ples of the

Abstract

$$\frac{3}{5} = \frac{6}{10} = \frac{60}{100}$$

$$\frac{3}{4} = \frac{75}{100}$$

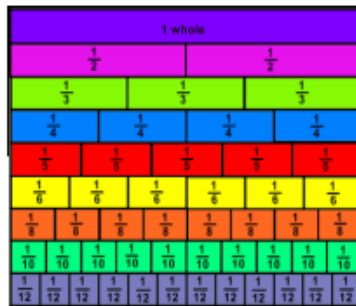
$$\frac{1}{5} = \frac{2}{10} = \frac{20}{100}$$

Concrete

has become $\frac{8}{20}$

has become $\frac{5}{20}$

Pictorial



Abstract

$$\frac{2}{5} \xrightarrow{\times 4} \frac{8}{20} \xrightarrow{\times 5} \frac{40}{100}$$

$$\frac{1}{4} \xrightarrow{\times 5} \frac{5}{20} \xrightarrow{\times 4} \frac{20}{100}$$

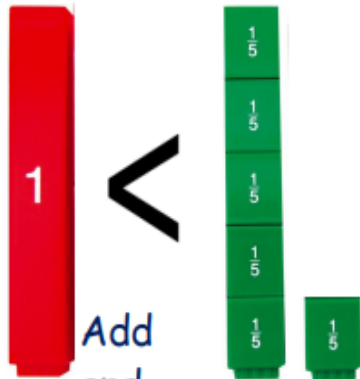
Fractions

Recognise mixed numbers and improper fractions. Convert from one form to the other and write mathematical statements >1 as a mixed number.

Year
r

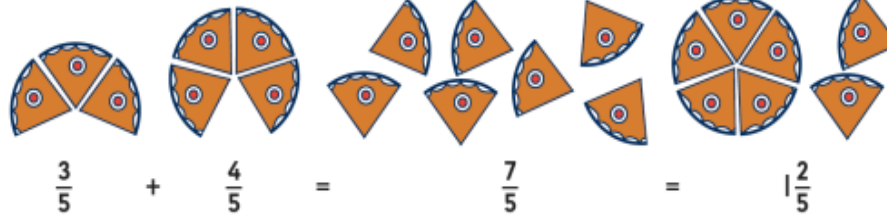
Fractions

Concrete



Add and

Pictorial



subtract fractions with the same denominators and denominators that are multiples of the same numbers.

Abstract

$$\frac{7}{2} = 3\frac{1}{2}$$

because $7 \div 2 = 3$ with 1 half left over

$$2\frac{1}{3} = \frac{7}{3}$$

because $2 \times 3 = 6$ with 1 third left to add

Concrete



Pictorial



Abstract

$$\frac{2}{5} - \frac{1}{4} = \frac{8}{20} - \frac{5}{20} = \frac{3}{20}$$

So,

$$\frac{8}{20} + \frac{5}{20} = \frac{13}{20}$$

$$\frac{2}{5} + \frac{1}{4} = \frac{13}{20}$$

So,

$$\frac{8}{20} - \frac{5}{20} = \frac{3}{20}$$

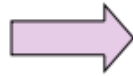
$$\frac{2}{5} - \frac{1}{4} = \frac{3}{20}$$

Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams

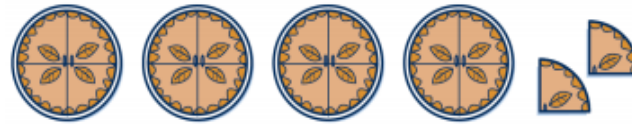
Concrete



6 lots of $\frac{3}{4}$



Pictorial



$4\frac{2}{4}$ altogether

to

Recognise and use tenths, hundredths and

thousandths and relate decimal equivalents.

Abstract

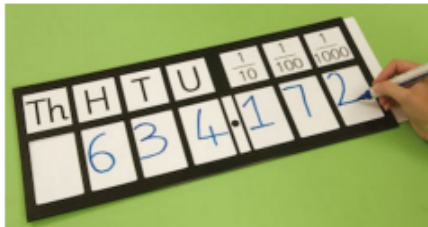
Multiply a proper fraction by a whole

$$\frac{3}{4} \times 6 = \frac{18}{4}$$

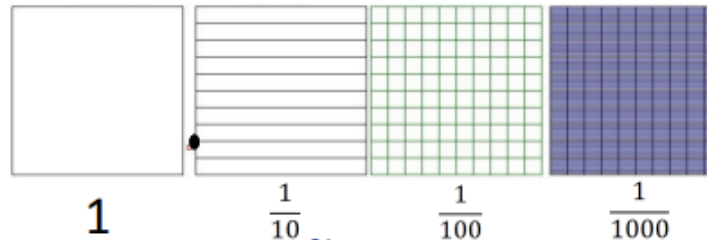
Change to a mixed number

$$\frac{18}{4} = 4\frac{2}{4}$$

Concrete



Pictorial



Recognise $\frac{1}{10}$ % $\frac{1}{100}$ sym-

bol and understand the meaning: write % as a fraction, decimal and percentage.

Abstract

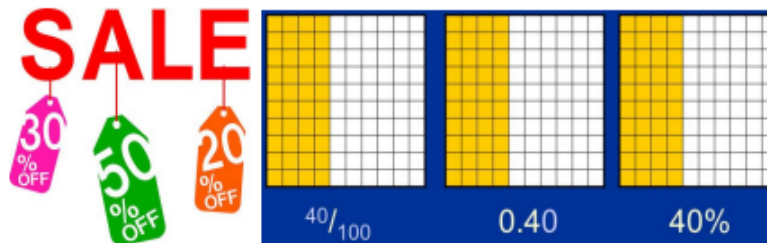
67.153

How many thousandths does this number have? How many more thousandths do you need to add to make 67.16?

Concrete



Pictorial



Abstract

$$\frac{4}{10} = 40\% = 0.4$$

$$\frac{32}{100} = 32\% = 0.32$$

$$\frac{75}{100} = 75\% = 0.75$$

$$\frac{2}{25} = \frac{8}{100} = 8\% = 0.08$$

Fractions

Add and subtract fractions with different denominators and mixed numbers using the concept of equivalent fractions.

Concrete

$1\frac{1}{2} + \frac{1}{3} = 1\frac{5}{6}$

Concrete including fractions > 1.

Pictorial

$1\frac{1}{2} + \frac{1}{3} = 1\frac{5}{6}$

and order

Abstract

$$1\frac{1}{2} + \frac{1}{3} = 1\frac{5}{6}$$

because $1\frac{1}{2} = \frac{3}{2}$

$$\frac{3}{2} = \frac{9}{6} \text{ and } \frac{1}{3} = \frac{2}{6}$$

$$\text{so } \frac{9}{6} + \frac{2}{6} = \frac{11}{6} = 1\frac{5}{6}$$

Fractions

Concrete

$\frac{5}{8} < \frac{6}{8}$

Pictorial

$\frac{5}{8} < \frac{6}{8}$

Abstract

Which is greater?

$$\frac{2}{8} < \frac{6}{16}$$

Ordering from smallest to largest by using equivalent fractions

$$\frac{5}{12}, \frac{2}{3}, \frac{5}{6}$$

$$\frac{5}{12}, \frac{8}{12}, \frac{10}{12}$$

Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.

Year
r

Concrete

Multiplying the answer in its simplest form.

Pictorial

pairs of fractions, write-

Abstract

Concrete

$\frac{1}{2}$ of $\frac{3}{4}$

Pictorial

$\frac{1}{2}$ of $\frac{3}{4}$

Abstract

$\frac{1}{2} \times \frac{3}{4} = \frac{3}{8}$

- multiply the numerators
- multiply the denominators
- simplify

Fractions

Recall and use equivalences between simple fractions, decimals and percentages including in different contexts.

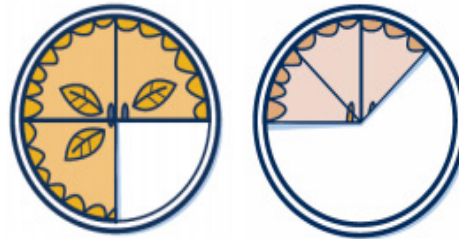
Year

Concrete



Pictorial

Which would you prefer 75% or $\frac{3}{8}$ of a pie?



75%

$\frac{3}{8}$

Divide proper fractions by whole numbers.

Abstract

John scored $\frac{40}{80}$ in his spelling test.
Hannah scored 40%. Who scored

$$\text{John} = \frac{40}{80} = 50\%$$

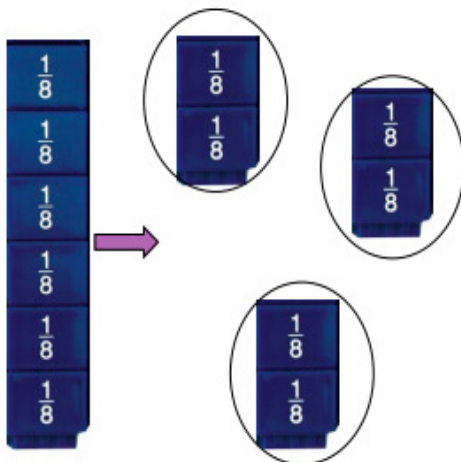
$$\text{Hannah} = 40\%$$

One paving slab is 0.3m long and a is $\frac{1}{4}$ of a metre. Which is long

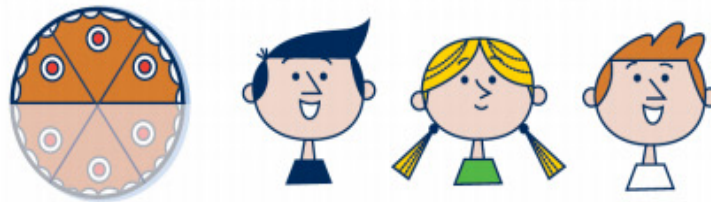
$$\frac{1}{4} = 0.25\text{m}$$

0.3m is larger than 0.25m

Concrete



Pictorial



$$\frac{1}{2} \div 3 = \frac{1}{6}$$

Abstract

$$\frac{1}{2} \div 3 = \frac{1}{6}$$

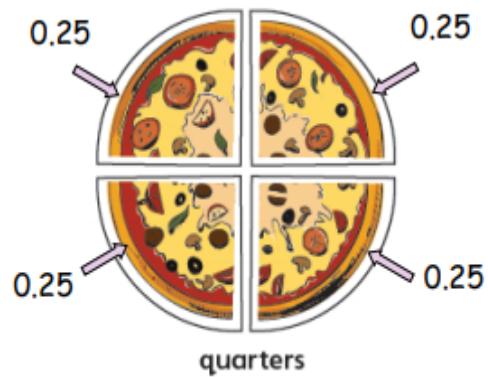
Keep it, change it, flip it!

$$\frac{1}{2} \times \frac{1}{3} = \frac{1}{6}$$

Fractions

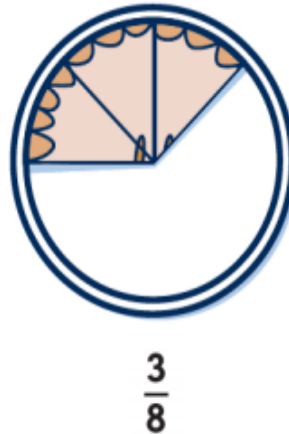
Associate fractions with division and calculate decimal fraction equivalents.

Concrete



Pictorial

3 slices of pie 'out of' 8



Abstract

$$\frac{3}{8}$$

3 'out of' 8 is the same as 3 'divided by' 8

$$3 \div 8 = 0.375$$

$$\text{So } \frac{3}{8} = 0.375$$

Fractions