

St. Peter's Catholic Primary School



Mathematical Calculations Policy

Date: May 2024

Review Date: May 2026

At St. Peter's Catholic Primary School, Jesus Christ and the Gospel values are at the centre of all of our teaching and relationships with children.

Mastering Number overview

The Year R curriculum is based on the NCETM Mastering number programme. The content is outline in the table below.

Mastering Number

Reception Overview

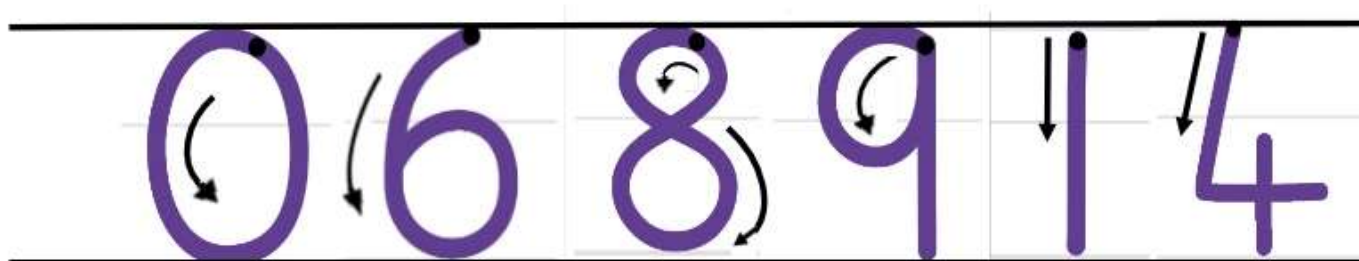
Term 1	Term 2	Term 3
<p>Pupils will build on previous experiences of number from their home and nursery environments, and further develop their subitising and counting skills. They will explore the composition of numbers within 5. They will begin to compare sets of objects and use the language of comparison.</p> <p>Pupils will:</p> <ul style="list-style-type: none"> identify when a set can be subitised and when counting is needed subitise different arrangements, both unstructured and structured, including using the Hungarian number frame make different arrangements of numbers within 5 and talk about what they can see, to develop their conceptual subitising skills spot smaller numbers 'hiding' inside larger numbers 	<p>Pupils will continue to develop their subitising and counting skills and explore the composition of numbers within and beyond 5. They will begin to identify when two sets are equal or unequal and connect two equal groups to doubles. They will begin to connect quantities to numerals.</p> <p>Pupils will:</p> <ul style="list-style-type: none"> continue to develop their subitising skills for numbers within and beyond 5, and increasingly connect quantities to numerals begin to identify missing parts for numbers within 5 explore the structure of the numbers 6 and 7 as '5 and a bit' and connect this to finger patterns and the Hungarian number frame focus on equal and unequal groups when comparing numbers 	<p>Pupils will consolidate their counting skills, counting to larger numbers and developing a wider range of counting strategies. They will secure knowledge of number facts through varied practice.</p> <p>Pupils will:</p> <ul style="list-style-type: none"> continue to develop their counting skills, counting larger sets as well as counting actions and sounds explore a range of representations of numbers, including the 10-frame, and see how doubles can be arranged in a 10-frame compare quantities and numbers, including sets of objects which have different attributes continue to develop a sense of magnitude, e.g. knowing that 8 is quite a lot more than 2, but 4 is only a little bit more than 2

<ul style="list-style-type: none"> connect quantities and numbers to finger patterns and explore different ways of representing numbers on their fingers hear and join in with the counting sequence, and connect this to the 'staircase' pattern of the counting numbers, seeing that each number is made of one more than the previous number develop counting skills and knowledge, including: that the last number in the count tells us 'how many' (cardinality); to be accurate in counting, each thing must be counted once and once only and in any order; the need for 1:1 correspondence; understanding that anything can be counted, including actions and sounds compare sets of objects by matching begin to develop the language of 'whole' when talking about objects which have parts 	<ul style="list-style-type: none"> understand that two equal groups can be called a 'double' and connect this to finger patterns sort odd and even numbers according to their 'shape' continue to develop their understanding of the counting sequence and link cardinality and ordinality through the 'staircase' pattern order numbers and play track games join in with verbal counts beyond 20, hearing the repeated pattern within the counting numbers 	<ul style="list-style-type: none"> begin to generalise about 'one more than' and 'one less than' numbers within 10 continue to identify when sets can be subitised and when counting is necessary develop conceptual subitising skills including when using a rekenrek
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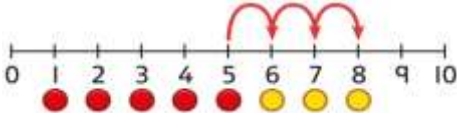
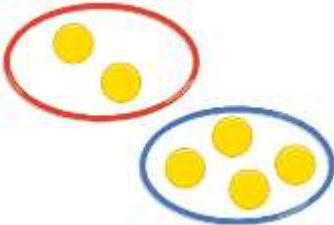
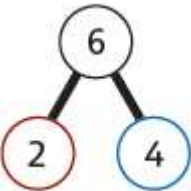
Years 1 and 2 base their fluency sessions on the Mastering Number and Number sense resources.

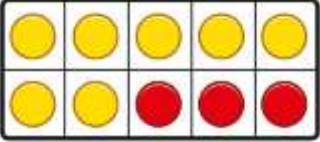
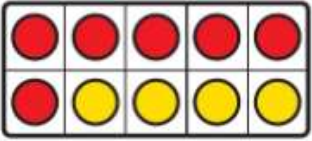
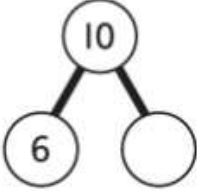
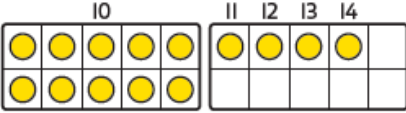
Correct formation of numerals

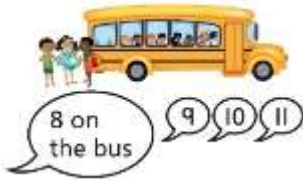
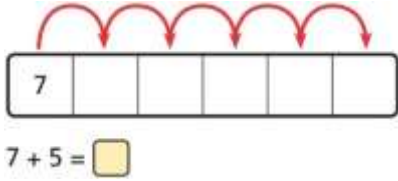
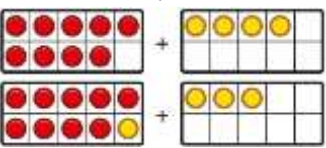
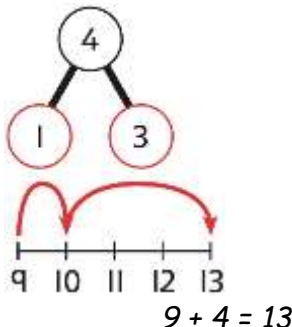
We use letter join to model the correct formation of letters and numerals. Numerals need to be formed clearly and correctly. See diagram below for correct formation of numerals.

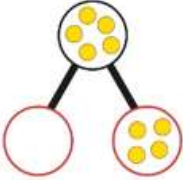
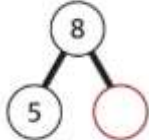
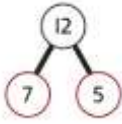


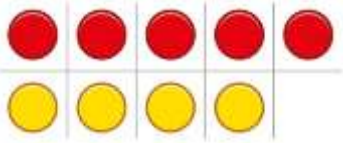
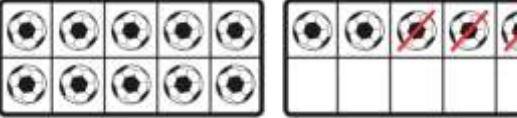
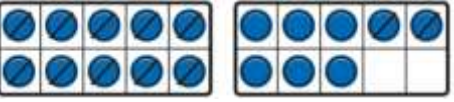
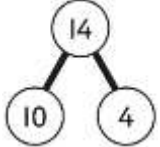
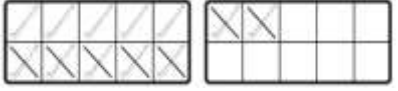
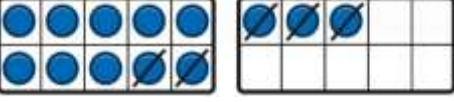
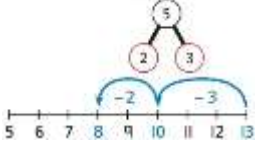
Year 1 four operations

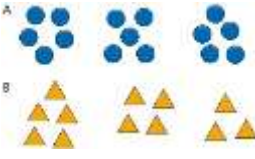
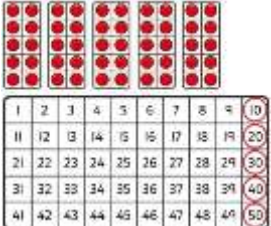
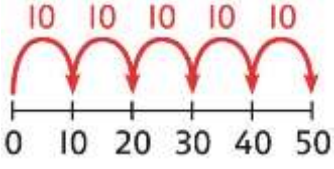
	Year 1 Addition		
	Concrete	Pictorial	Abstract
Counting and adding more	<p>Children add one more person or object to a group to find one more.</p>	<p>Children add one more cube or counter to a group to represent one more.</p>  <p><i>One more than 4 is 5.</i></p>	<p>Use a number line to understand how to link counting on with finding one more.</p>  <p><i>One more than 6 is 7. 7 is one more than 6.</i></p> <p>Learn to link counting on with adding more than one.</p>  <p>$5 + 3 = 8$</p>
Understanding part part whole relationship	<p>Sort people and objects into parts and understand the relationship with the whole.</p>  <p><i>The parts are 2 and 4. The whole is 6.</i></p>	<p>Children draw to represent the parts and understand the relationship with the whole.</p>   <p><i>The parts are 2 and 4. The whole is 6.</i></p>	<p>Use a part-whole model to represent the numbers.</p> <p>$2 + 4 = 6$</p>

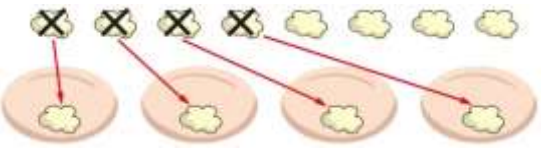
Knowing and finding number bonds within 10	<p>Break apart a group and put back together to find and form number bonds.</p>  $3 + 4 = 7$  $6 = 2 + 4$	<p>Use five and ten frames to represent key number bonds.</p>  $5 = 4 + 1$  $10 = 7 + 3$	<p>Use a part-whole model alongside other representations to find number bonds.</p>   <p>Make sure to include examples where one of the parts is zero.</p>
Understanding teen numbers as a complete 10 and some more	<p>Complete a group of 10 objects and count more.</p>  <p><i>13 is 10 and 3 more.</i></p>	<p>Use a ten frame to support understanding of a complete 10 for teen numbers.</p>  <p><i>14 is 10 and 4 more.</i></p>	<p><i>1 ten and 5 ones equal 15.</i> $10 + 5 = 15$</p>

Adding by counting on	<p>Children use knowledge of counting to 20 to find a total by counting on using people or objects.</p> 	<p>Children use counters to support and represent their counting on strategy.</p> 	<p>Children use number lines or number tracks to support their counting on strategy.</p> 
Bridging 10 using number bonds	<p>Children use a bead string to complete a 10 and understand how this relates to the addition.</p>  <p><i>7 add 3 makes 10. So, 7 add 5 is 10 and 2 more.</i></p>	<p>Children use counters to complete a ten frame and understand how they can add using knowledge of number bonds to 10.</p> 	<p>Use a part-whole model and a number line to support the calculation.</p> 

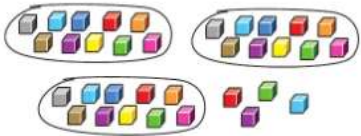
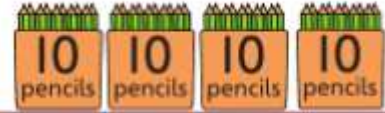
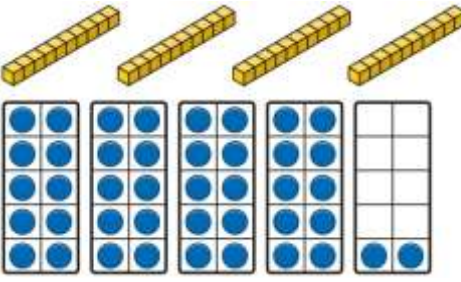
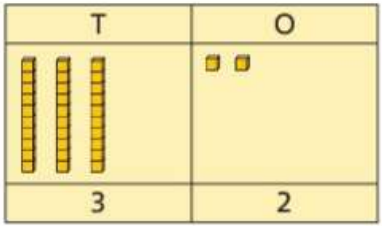
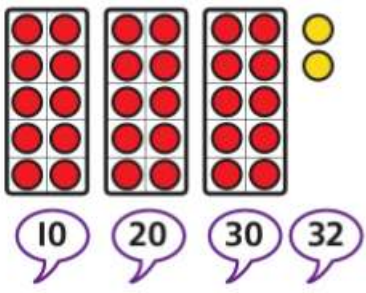
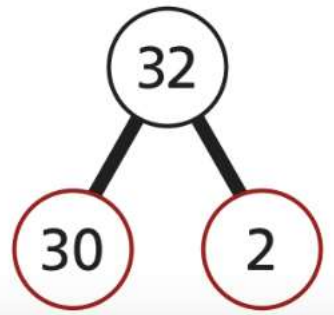
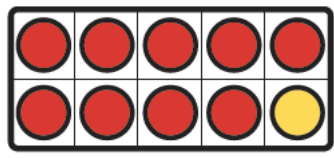
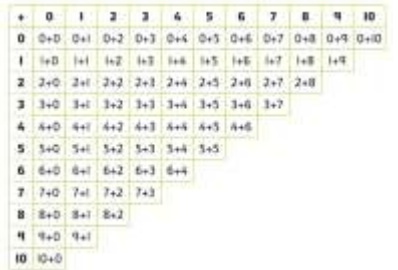
	Year 1 Subtraction		
	Concrete	Pictorial	Abstract
Counting back and taking away	<p>Children arrange objects and remove to find how many are left.</p> <p>1 less than 6 is 5. 6 subtract 1 is 5.</p> 	<p>Children draw and cross out or use counters to represent objects from a problem.</p>  <p>9 - 4 = <input type="text"/></p> <p>There are <input type="text"/> children left.</p>	<p>Children count back to take away and use a number line or number track to support the method.</p>  <p>9 - 3 = 6</p>
Finding a missing part, given a whole and a part	<p>Children separate a whole into parts and understand how one part can be found by subtraction.</p>  <p>8 - 5 = ?</p>	<p>Children represent a whole and a part and understand how to find the missing part by subtraction.</p>  <p>5 - 4 = <input type="text"/></p>	<p>Children use a part-whole model to support the subtraction to find a missing part.</p>  <p>8 - 5 = ?</p> <p>Children develop an understanding of the relationship between addition and subtraction facts in a part-whole model.</p>  <p> <input type="text"/> + <input type="text"/> = <input type="text"/> <input type="text"/> - <input type="text"/> = <input type="text"/> <input type="text"/> + <input type="text"/> = <input type="text"/> <input type="text"/> - <input type="text"/> = <input type="text"/> </p>

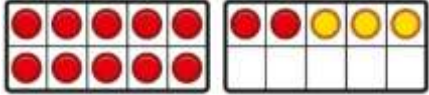
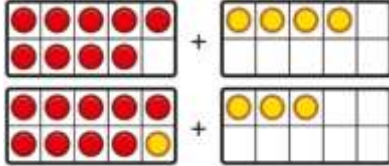
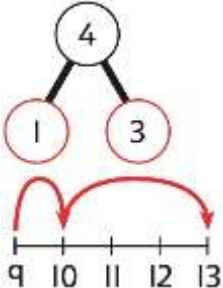
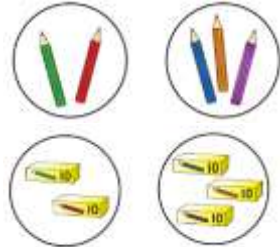
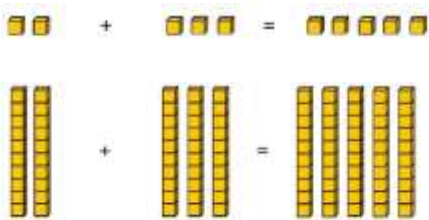
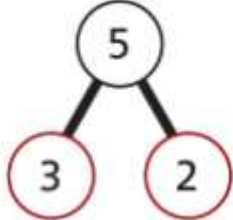
Finding the difference	<p>Arrange two groups so that the difference between the groups can be worked out.</p>  <p>8 is 2 more than 6. 6 is 2 less than 8. The difference between 8 and 6 is 2.</p>	<p>Represent objects using sketches or counters to support finding the difference.</p>  <p>$5 - 4 = 1$ The difference between 5 and 4 is 1.</p>	<p>Children understand 'find the difference' as subtraction.</p>  <p>$10 - 4 = 6$ The difference between 10 and 6 is 4.</p>
Subtraction within 20	<p>Understand when and how to subtract 1s efficiently.</p> <p>Use a bead string to subtract 1s efficiently.</p>  <p>$5 - 3 = 2$ $15 - 3 = 12$</p>	<p>Understand when and how to subtract 1s efficiently.</p>  <p>$5 - 3 = 2$ $15 - 3 = 12$</p>	<p>Understand how to use knowledge of bonds within 10 to subtract efficiently.</p> <p>$5 - 3 = 2$ $15 - 3 = 12$</p>
Subtracting 10s and 1s	<p>For example: $18 - 12$</p> <p>Subtract 12 by first subtracting the 10, then the remaining 2.</p>  <p>First subtract the 10, then take away 2.</p>	<p>For example: $18 - 12$</p> <p>Use ten frames to represent the efficient method of subtracting 12.</p>  <p>First subtract the 10, then subtract 2.</p>	<p>Use a part-whole model to support the calculation.</p>  <p>$19 - 14$ $19 - 10 = 9$ $9 - 4 = 5$ So, $19 - 14 = 5$</p>
Subtraction bridging 10	<p>For example: $12 - 7$</p> <p>Arrange objects into a 10 and some 1s, then decide on how to split the 7 into parts.</p>  <p>7 is 2 and 5, so I take away the 2 and then the 5.</p>	<p>Represent the use of bonds using ten frames.</p>  <p>For $13 - 5$, I take away 3 to make 10, then take away 2 to make 8.</p>	<p>Subtraction bridging 10 using number bonds</p> <p>Use a number line and a part-whole model to support the method.</p> <p>$13 - 5$</p> 

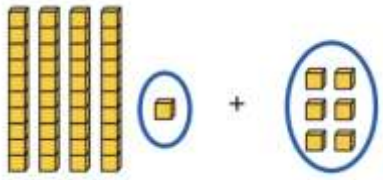
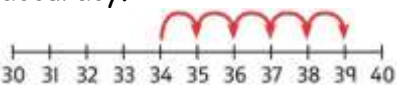
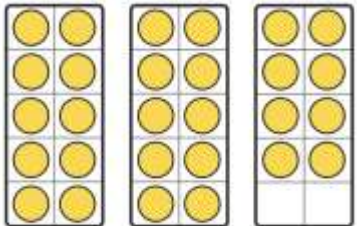
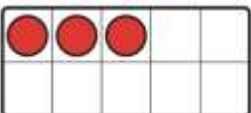
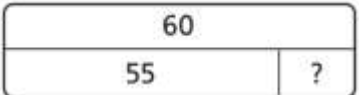
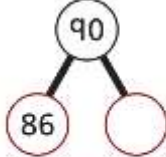
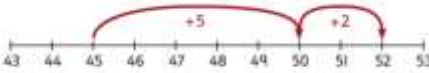
	Year 1 Multiplication		
	Concrete	Pictorial	Abstract
Making equal groups	<p>Children arrange objects in equal and unequal groups and understand how to recognise whether they are equal.</p> 	<p>Children draw and represent equal and unequal groups.</p> 	<p>Three equal groups of 4. Four equal groups of 3.</p>
Equal groups total - counting in 2s, 5s and 10s	 <p>There are 5 pens in each pack ... 5...10...15...20...25...30...35...40...</p>	<p>100 squares and ten frames support counting in 2s, 5s and 10s.</p> 	<p>Use a number line to support repeated addition through counting in 2s, 5s and 10s.</p> 

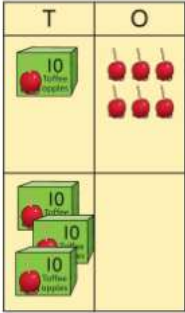
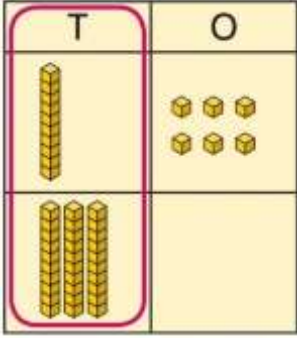
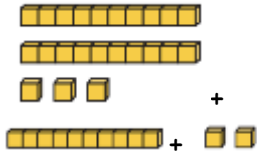
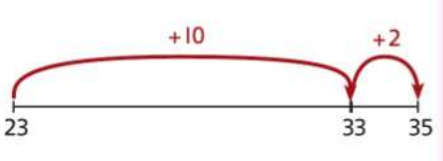
	Year 1 Division		
	Concrete	Pictorial	Abstract
Grouping	<p>Learn to make equal groups from a whole and find how many equal groups of a certain size can be made.</p> <p>Sort a whole set people and objects into equal groups.</p>  <p><i>There are 10 children altogether. There are 2 in each group. There are 5 groups.</i></p>	<p>Represent a whole and work out how many equal groups.</p>  <p><i>There are 10 in total. There are 5 in each group. There are 2 groups.</i></p>	<p>Children may relate this to counting back in steps of 2, 5 or 10.</p> 
	<p>Share a set of objects into equal parts and work out how many are in each part.</p> 	<p>Sketch or draw to represent sharing into equal parts. This may be related to fractions.</p> 	<p><i>10 shared into 2 equal groups gives 5 in each group.</i></p>

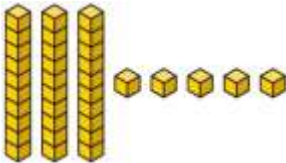
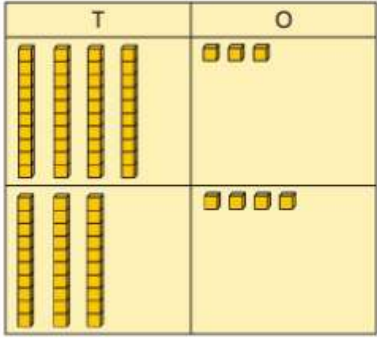
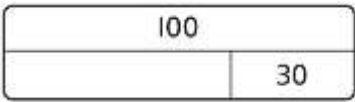
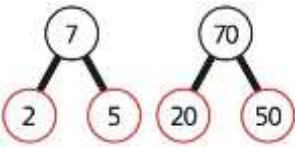
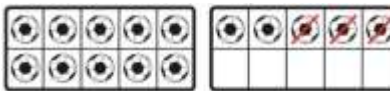
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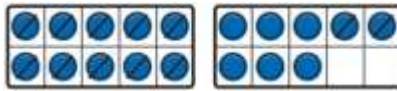
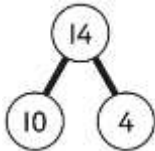
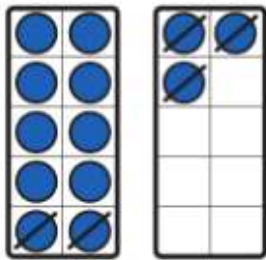
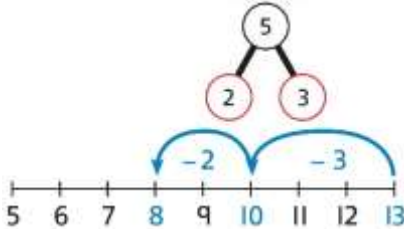
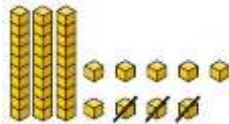
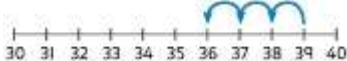
	Year 2 Addition		
	Concrete	Pictorial	Abstract
Understanding 10s and 1s	<p>Group objects into 10s and 1s.</p>  <p>Bundle straws, pencils or pens to understand unitising of 10s.</p> 	<p>Understand 10s and 1s equipment, and link with visual representations on ten frames.</p>  <p>Represent numbers on a place value grid, using equipment or numerals.</p> 	<p>Partition 2-digit numbers into 10s and 1s</p>   <p>$32 = 30 + 2$</p>
Number bonds within 10	<p>Systematically build confidence and fluency in recall of number bonds within 10</p>  <p>$4 + 4 = 8$. This is a double</p>	<p>Systematically build confidence and fluency in recall of number bonds within 10</p>  <p>This is a bond to 10. $9 + 1 = 10$</p>	<p>Systematically build confidence and fluency in recall of number bonds within 10</p> 

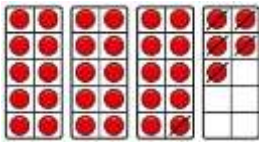
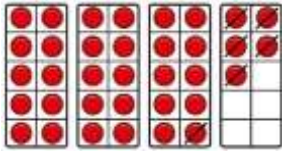
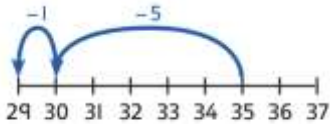
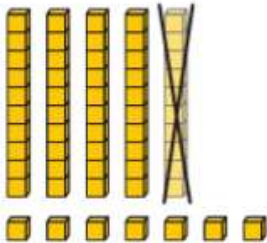
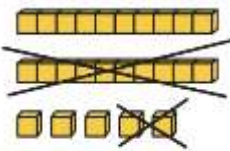
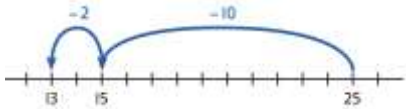
Adding the ones	<p>Children represent 10s and 1s with everyday items.</p> 	<p>Children represent calculations using ten frames to add a teen and 1s.</p>  <p>$2 + 3 = 5$ $12 + 3 = 15$</p>	<p>Children recognise that a teen is made from a 10 and some 1s and use their knowledge of addition within 10 to work efficiently.</p> <p>$3 + 5 = 8$ So, $13 + 5 = 18$</p>
Bridging 10 using number bonds	<p>Children use counters to complete a ten frame and understand how they can add using knowledge of number bonds to 10.</p> 	<p>Use a part-whole model and a number line to support the calculation.</p>  <p>$9 + 4 = 13$</p>	<p>Children use a bead string to complete a 10 and understand how this relates to the addition.</p>  <p><i>7 add 3 makes 10.</i> So, <i>7 add 5 is 10 and 2 more.</i></p>
add two multiples of 10	<p>Use known bonds and unitising to add 10s.</p>  <p><i>I know that $2 + 3 = 5$.</i> So, <i>I know that 2 tens add 3 tens is 5 tens.</i></p>	<p>Use known bonds and unitising to add 10s.</p>  <p><i>I know that $2 + 3 = 5$</i> So, <i>I know that 2 tens add 3 tens is 5 tens.</i></p>	<p>Use known bonds and unitising to add 10s.</p>  <p>$3 + 2 = 5$ $3 \text{ tens} + 2 \text{ tens} = 5 \text{ tens}$ $30 + 20 = 50$</p>

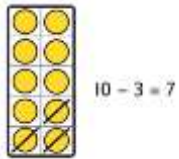
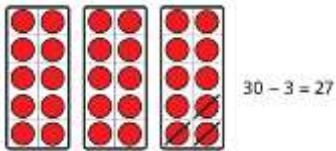
Add a 2 digit number and 1s	<p>Add the 1s to find the total. Use known bonds within 10.</p>  <p><i>41 is 4 tens and 1 one.</i> <i>41 add 6 ones is 4 tens and 7 ones.</i></p>	<p>Add the ones using known bonds</p>  <p>$1 + 6 = 7$</p> <p>So</p> <p>$41 + 6 = 47$</p>	<p>Add the 1s.</p> <p>Understand the link between counting on and using known number facts. Children should be encouraged to use known number bonds to improve efficiency and accuracy.</p>  <p>$4 + 5 = 9$</p> <p>So</p> <p>$34 + 5 = 39$</p>
Add to the next ten	<p>Use known bonds to 10 to add to the next multiple of 10</p>  <p>$8 + 2 = 10$</p> <p>So</p> <p>$28 + 2 = 30$</p>	<p>Use known bonds to 10 to add to the next multiple of 10</p> <p> $3 + \square = 10$ $33 + \square = 40$ $43 + \square = 50$ $73 + \square = 80$ </p> 	<p>Use known bonds to 10 to add to the next multiple of 10</p>  <p>$55 + \square = 60$</p>  <p>$86 + \square = 90$</p>
Add across a ten	<p>Use place value equipment to support adding across any multiple of 10</p>  <p>$45 + 5 + 2 = 52$</p> <p>$45 + 7 = 52$</p>	<p>Add across any multiple of 10 using two jumps</p>  <p>$45 + 5 + 2 = 52$</p> <p>$45 + 7 = 52$</p>	<p>Add across any multiple of 10 using two steps</p> <p>$45 + 5 + 2 = 52$</p> <p>$45 + 7 = 52$</p>

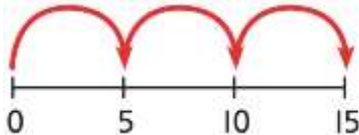
<p>Add 10s to a 2 digit number</p>	<p>Add the 10s using a place value grid to support, using classroom items to represent the numbers.</p>  <p>16 is 1 ten and 6 ones. 30 is 3 tens. There are 4 tens and 6 ones in total.</p>	<p>Add the 10s using a place value grid to support.</p>  <p>16 is 1 ten and 6 ones. 30 is 3 tens. There are 4 tens and 6 ones in total.</p>	<p>Use known bonds and knowledge of place value to add multiples of 10</p> <p>$16 + 30 = ?$</p> <p>1 ten + 3 tens is 4 tens</p> <p>There are 4 tens and 6 ones in total.</p> <p>$16 + 30 = 46$</p> <p>Count on in tens from a given number</p> <p>'Start on 16', '26', '36', '46'</p> <p>$16 + 30 = 46$</p>
<p>Add more tens, then more ones</p>	<p>Add on from a 2-digit number by adding tens then ones.</p>  <p>Start on "23", "33", "35"</p>	<p>Add on from a 2-digit number by adding 10s then 1s.</p>  <p>$23 + 12 = 23 + 10 + 2$</p>	<p>Add on from a 2-digit number by adding tens then ones.</p> <p>$23 + 12 = 23 + 10 + 2$</p>

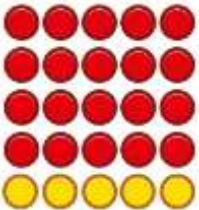
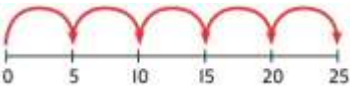
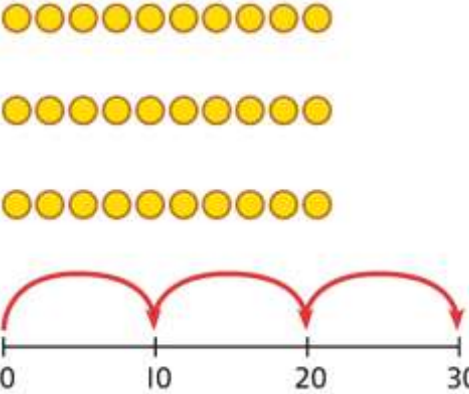
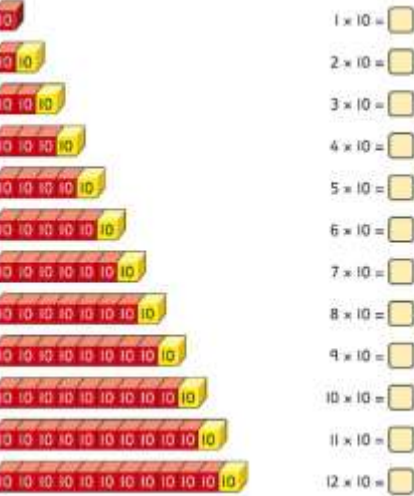
Add the ones and tens separately	<p>Add the 10s and 1s separately.</p>  <p>$5 + 3 = 8$ There are 8 ones in total.</p> <p>$3 + 2 = 5$ There are 5 tens in total.</p> <p>$35 + 23 = 58$</p>	<p>Add the 1s and the 10s then recombine</p>  <p>3 ones and 4 ones is 7 ones</p> <p>4 tens and 3 tens is 7 tens</p> <p>$43 + 34 = 77$</p>	<p>Add the 10s and 1s separately.</p> <p>$32 + 11$</p> <p>$30 + 10 = 40$ $2 + 1 = 3$</p> <p>$32 + 11 = 43$</p>
Year 2 Subtraction			
	Concrete	Pictorial	Abstract
Subtract two multiples of 10	<p>Use known number bonds and unitising to subtract multiples of 10.</p>  <p>8 subtract 6 is 2. So, 8 tens subtract 6 tens is 2 tens.</p>	<p>Use known number bonds and unitising to subtract multiples of 10.</p>  <p>$10 - 3 = 7$ So, 10 tens subtract 3 tens is 7 tens.</p>	<p>Use known number bonds and unitising to subtract multiples of 10.</p>  <p>7 tens subtract 5 tens is 2 tens. $70 - 50 = 20$</p>
Subtraction within 20	<p>Understand when and how to subtract 1s efficiently.</p>  <p>$5 - 3 = 2$ $15 - 3 = 12$</p>	<p>Understand how to use knowledge of bonds within 10 to subtract efficiently.</p> <p>$5 - 3 = 2$ $15 - 3 = 12$</p>	<p>Understand when and how to subtract 1s efficiently.</p> <p>Use a bead string to subtract 1s efficiently.</p>  <p>$5 - 3 = 2$ $15 - 3 = 12$</p>

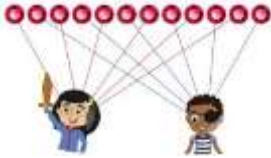
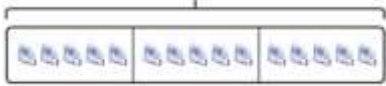
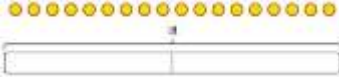
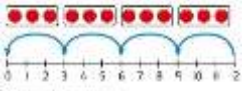
Subtracting 10s and 1s	<p>For example: $18 - 12$</p> <p>Use ten frames to represent the efficient method of subtracting 12.</p>  <p><i>First subtract the 10, then subtract 2.</i></p>	<p>Use a part-whole model to support the calculation.</p>  <p>$19 - 14$ $19 - 10 = 9$ $9 - 4 = 5$ So, $19 - 14 = 5$</p>	<p>For example: $18 - 12$</p> <p><i>First subtract the 10, then take away 2.</i></p>								
Subtraction bridging 10 using number bonds	<p>Represent the use of bonds using ten frames.</p>  <p><i>For $13 - 5$, I take away 3 to make 10, then take away 2 to make 8.</i></p>	<p>Use a number line and a part-whole model to support the method.</p> <p>$13 - 5$</p> 	<p>For example: $12 - 7$</p> <p>Arrange objects into a 10 and some 1s, then decide on how to split the 7 into parts.</p> <p><i>7 is 2 and 5, so I take away the 2 and then the 5.</i></p>								
Subtracting a single digit number	<p>Subtract the 1s. This may be done in or out of a place value grid using classroom items to represent the numbers.</p>  <table border="1" data-bbox="170 1731 419 1886"><tr><th>T</th><th>O</th></tr><tr><td></td><td></td></tr></table> <p>"9 ones subtract 3 ones is 6 ones"</p> <p>$39 - 3 = 36$</p>	T	O			<p>Subtract the 1s. This may be done in or out of a place value grid.</p>  <table border="1" data-bbox="584 1680 845 1839"><tr><th>T</th><th>O</th></tr><tr><td></td><td></td></tr></table> <p>"9 ones subtract 3 ones is 6 ones"</p> <p>$39 - 3 = 36$</p>	T	O			<p>Subtract the 1s. Understand the link between counting back and subtracting the 1s using known bonds.</p>  <p>$9 - 3 = 6$</p> <p>$39 - 3 = 36$</p>
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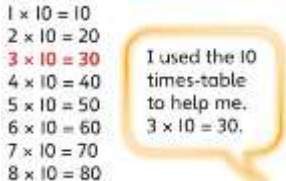
Subtracting a single digit number	<p>Bridge 10 by using known bonds.</p>  <p>$35 - 6$ I took away 5 counters, then 1 more.</p>	<p>Bridge 10 by using known bonds.</p>  <p>$35 - 6$ First, I will subtract 5, then 1.</p>	<p>Bridge 10 by using known bonds.</p>  <p>$35 - 5 - 1 = 29$</p> <p>$35 - 6 = ?$ $35 - 5 = 30$ $30 - 1 = 29$</p>
Subtract from a 2 digit number	<p>Subtract tens from a 2-digit number</p> 	<p>Draw dienes to work out the answer.</p>	<p>$57 - 10 = 47$</p>
Subtracting tens and ones from a 2 digit number	<p>Subtract 10s then 1s using place value equipment.</p>  <p>$25 - 10 - 2 = 13$ $25 - 12 = 13$</p>	<p>Subtract 10s then 1s with a number line for visual support.</p>  <p>$25 - 10 - 2 = 13$ $25 - 12 = 13$</p>	<p>Subtract 10s then 1s.</p> <p>$25 - 10 - 2 = 13$ $25 - 12 = 13$</p>

Subtract ones from a multiple of 10 (preparation for bridging)	<p>Subtract from a 10 using known bonds to 10 using place value equipment.</p>  <p>$10 - 3 = 7$</p>  <p>$30 - 3 = 27$</p>  <p>$50 - 3 = 47$</p>	<p>Subtract from a 10 using known bonds to 10.</p>  <p>$50 - 2 = 48$</p>	<p>Subtract from a 10 using known bonds to 10.</p> <p>$10 - 3 = 7$</p> <p>$30 - 3 = 27$</p> <p>$60 - 3 = 57$</p> <p>$90 - 3 = 87$</p>
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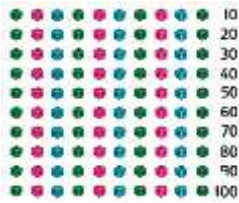
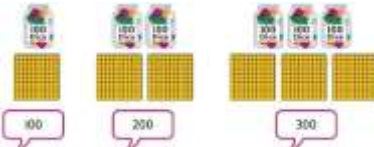
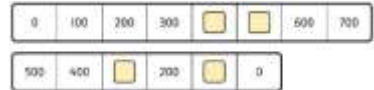
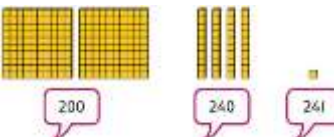
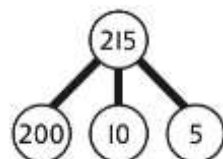
Year 2 Multiplication			
	Concrete	Pictorial	Abstract
Equal groups and repeated addition	<p>Recognise equal groups and write as repeated addition and as multiplication.</p>  <p><i>3 groups of 5 chairs</i> <i>15 chairs altogether</i></p>	<p>Recognise equal groups using standard objects such as counters and write as repeated addition and multiplication.</p>  <p><i>3 groups of 5</i> <i>15 in total</i></p>	<p>Use a number line and write as repeated addition and as multiplication.</p>  <p>$5 + 5 + 5 = 15$ $3 \times 5 = 15$</p>

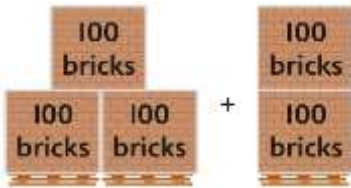
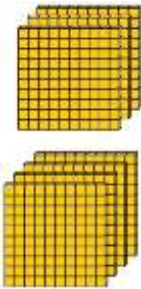
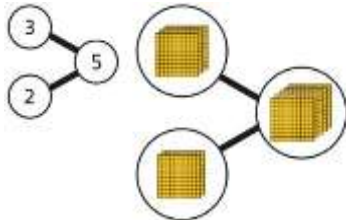
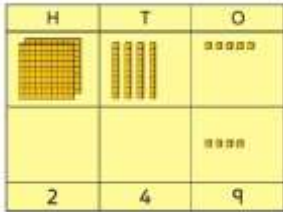
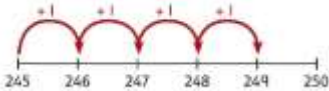
Using arrays to represent multiplication	<p>Understand the relationship between arrays, multiplication and repeated addition.</p>  <p>4 groups of 5</p>	<p>Understand the relationship between arrays, multiplication and repeated addition.</p>  <p>4 groups of 5 ... 5 groups of 5</p>	<p>Understand the relationship between arrays, multiplication and repeated addition.</p>  <p>$5 \times 5 = 25$</p>
Commutativity	<p>Use arrays to visualise commutativity.</p>  <p>I can see 6 groups of 3. I can see 3 groups of 6.</p>	<p>Form arrays using counters to visualise commutativity. Rotate the array to show that orientation does not change the multiplication.</p>  <p>This is 2 groups of 6 and also 6 groups of 2.</p>	<p>Use arrays to visualise commutativity.</p>  <p>$4 + 4 + 4 + 4 + 4 = 20$ $5 + 5 + 5 + 5 = 20$ $4 \times 5 = 20$ and $5 \times 4 = 20$</p>
Learning 10x, 5x and 2x timetables	<p>Develop an understanding of how to unitise groups of 2, 5 and 10 and learn corresponding times-table facts.</p>  <p>3 groups of 10 ... 10, 20, 30</p>	<p>Understand how to relate counting in unitised groups and repeated addition with knowing key times-table facts.</p>  <p>$10 + 10 + 10 = 30$ $3 \times 10 = 30$</p>	<p>Understand how the times-tables increase and contain patterns.</p>  <p>$5 \times 10 = 50$ $6 \times 10 = 60$</p>

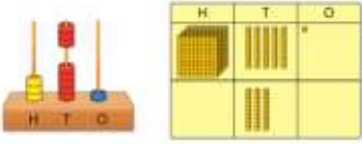
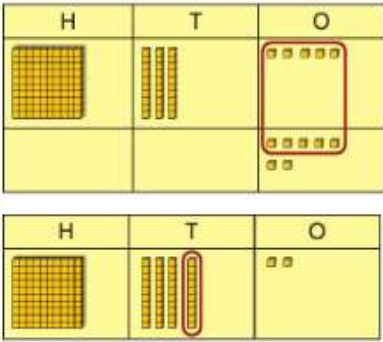
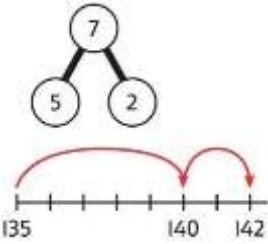
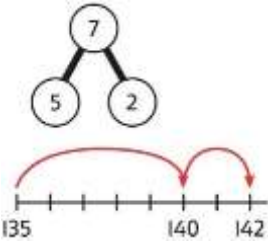
	$3 \times 10 = 30$		
	Year 2 Division		
	Concrete	Pictorial	Abstract
Sharing equally	<p>Start with a whole and share into equal parts, one at a time.</p>  <p>12 shared equally between 2. They get 6 each.</p> <p>Start to understand how this also relates to grouping. To share equally between 3 people, take a group of 3 and give 1 to each person. Keep going until all the objects have been shared</p>   <p>They get 5 each.</p> <p>15 shared equally between 3. They get 5 each.</p>	<p>Represent the objects shared into equal parts using a bar model.</p>  <p>20 shared into 5 equal parts. There are 4 in each part.</p>	<p>Use a bar model to support understanding of the division.</p>  <p>$18 \div 2 = 9$</p>
	<p>Understand how to make equal groups from a whole.</p>  <p>8 divided into 4 equal groups. There are 2 in each group.</p>	<p>Understand the relationship between grouping and the division statements.</p> <p>$12 \div 3 = 4$</p>  <p>$12 \div 4 = 3$</p>  <p>$12 \div 6 = 2$</p>  <p>$12 \div 2 = 6$</p> 	<p>Understand how to relate division by grouping to repeated subtraction.</p>  <p>There are 4 groups of 3.</p> <p>12 divided into groups of 3. $12 \div 3 = 4$</p>

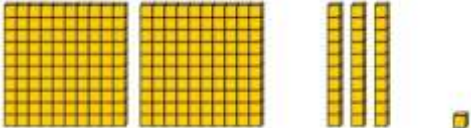
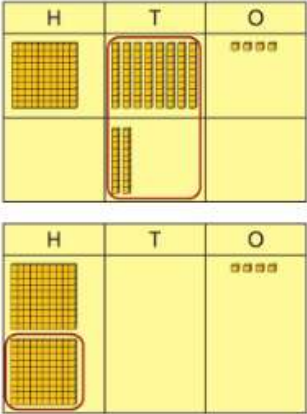
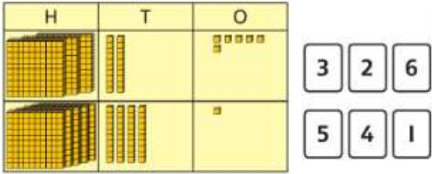
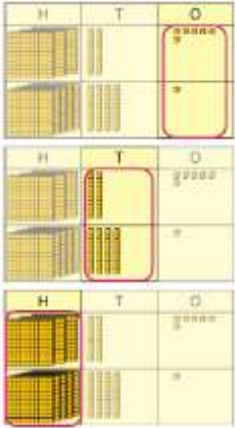
			There are 4 groups.
Using known times tables to solve divisions	<p>Understand the relationship between multiplication facts and division.</p>  <p>4 groups of 5 cars is 20 cars in total. 20 divided by 4 is 5.</p>	<p>Link equal grouping with repeated subtraction and known times-table facts to support division.</p>  <p>40 divided by 4 is 10.</p> <p>Use a bar model to support understanding of the link between times-table knowledge and division.</p> 	<p>Relate times-table knowledge directly to division.</p>  <p>I know that 3 groups of 10 makes 30, so I know that 30 divided by 10 is 3.</p> <p>$3 \times 10 = 30$ so $30 \div 10 = 3$</p>

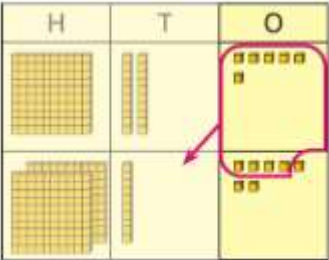
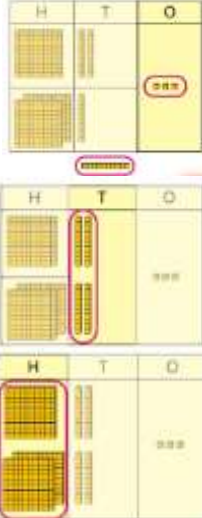
Year 3 four operations

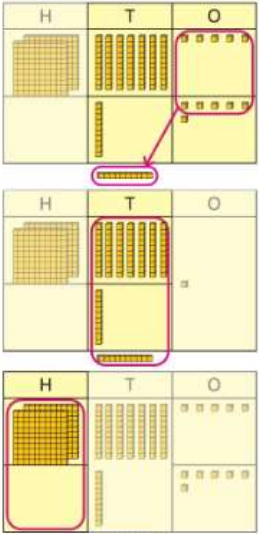
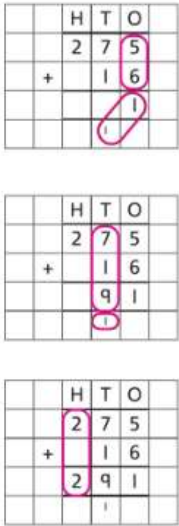
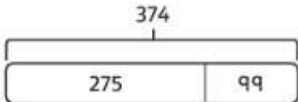
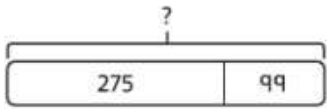
	Year 3 Addition		
	Concrete	Pictorial	Abstract
Understanding 100s	<p>Understand the cardinality of 100, and the link with 10 tens.</p> <p>Use cubes to place into groups of 10 tens.</p> 	<p>Unitise 100 and count in steps of 100.</p> 	<p>Represent steps of 100 on a number line and a number track and count up to 1,000 and back to 0.</p> 
Understanding place value to 1,000	<p>Unitise 100s, 10s and 1s to build 3-digit numbers.</p> 	<p>Use equipment to represent numbers to 1,000.</p>  <p>Use a place value grid to support the structure of numbers to 1,000.</p> <p>Place value counters are used alongside other equipment. Children should understand how each counter represents a different unitised amount.</p>	<p>Represent the parts of numbers to 1,000 using a part-whole model.</p>  <p>$215 = 200 + 10 + 5$</p> <p>Recognise numbers to 1,000 represented on a number line, including those between intervals.</p>

<p>Adding hundreds</p>	<p>Use known facts and unitising to add multiples of 100.</p>  <p>$3 + 2 = 5$</p> <p><i>3 hundreds + 2 hundreds = 5 hundreds</i></p> <p>$300 + 200 = 500$</p>	<p>Use known facts and unitising to add multiples of 100.</p>  <p>$3 + 4 = 7$</p> <p><i>3 hundreds + 4 hundreds = 7 hundreds</i></p> <p>$300 + 400 = 700$</p>	<p>Use known facts and unitising to add multiples of 100.</p> <p>Represent the addition on a number line.</p> <p>Use a part-whole model to support unitising.</p>  <p>$3 + 2 = 5$</p> <p>$300 + 200 = 500$</p>
<p>3 digit number + 1s no exchange or bridging</p>	<p>Use number bonds to add the 1s.</p>  <p>$214 + 4 = ?$</p> <p><i>Now there are 4 + 4 ones in total.</i></p> <p>$4 + 4 = 8$</p> <p>$214 + 4 = 218$</p>	<p>Use number bonds to add the 1s.</p>  <p>$245 + 4$</p> <p>$5 + 4 = 9$</p> <p>$245 + 4 = 249$</p>	<p>Understand the link with counting on.</p> <p>$245 + 4$</p>  <p>Use number bonds to add the 1s and understand that this is more efficient and less prone to error.</p> <p>$245 + 4 = ?$</p> <p><i>I will add the 1s.</i></p> <p>$5 + 4 = 9$</p> <p><i>So, $245 + 4 = 249$</i></p>

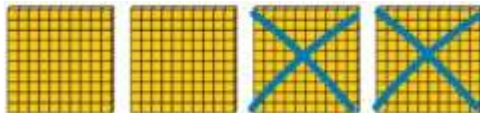
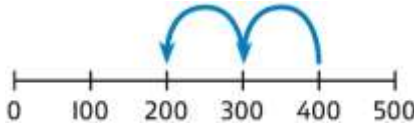
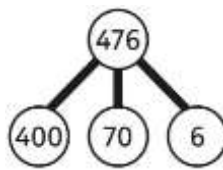
3 digit number + 10s, no exchange	<p>Calculate mentally by forming the number bond for the 10s.</p>  <p>234 + 50</p> <p>There are 3 tens and 5 tens altogether.</p> <p>3 + 5 = 8</p> <p>In total there are 8 tens.</p> <p>234 + 50 = 284</p>	<p>Calculate mentally by forming the number bond for the 10s.</p> <p>351 + 30 = ?</p>  <p>5 tens + 3 tens = 8 tens</p> <p>351 + 30 = 381</p>	<p>Calculate mentally by forming the number bond for the 10s.</p> <p>753 + 40</p> <p>I know that 5 + 4 = 9</p> <p>So, 50 + 40 = 90</p> <p>753 + 40 = 793</p>
3 digit number + 1s with exchange	<p>Understand that when the 1s sum to 10 or more, this requires an exchange of 10 ones for 1 ten.</p> <p>Children should explore this using unitised objects or physical apparatus.</p>  <p>135 + 7 = 142</p>	<p>Exchange 10 ones for 1 ten where needed. Use a place value grid to support the understanding.</p>  <p>135 + 7 = ?</p> <p>135 + 5 + 2 = 142</p> <p>Ensure that children understand how to add 1s bridging a 100.</p> <p>198 + 5 = ?</p> <p>198 + 2 + 3 = 203</p>	<p>Understand how to bridge by partitioning to the 1s to make the next 10.</p>  <p>135 + 7 = ?</p> <p>135 + 5 + 2 = 142</p> <p>Ensure that children understand how to add 1s bridging a 100.</p> <p>198 + 5 = ?</p> <p>198 + 2 + 3 = 203</p>

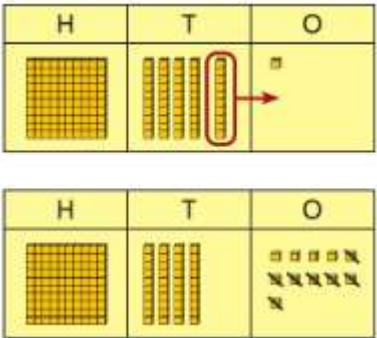
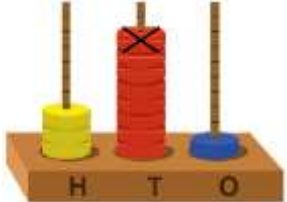
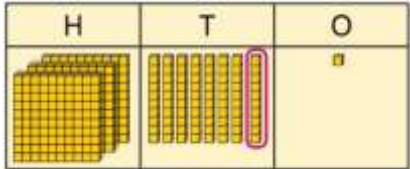
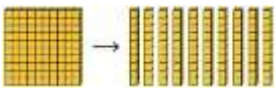
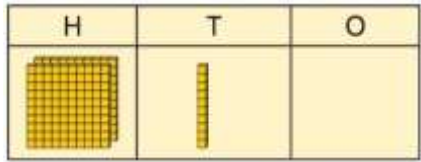
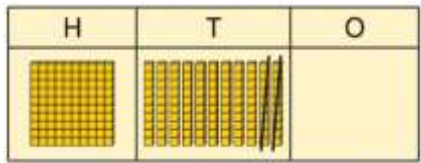
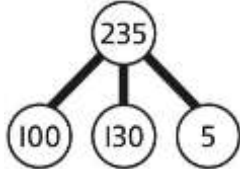
<p>3 digit number + 10s with exchange</p>	<p>Understand the exchange of 10 tens for 1 hundred.</p> 	<p>Add by exchanging 10 tens for 1 hundred.</p> $184 + 20 = ?$  $184 + 20 = 204$	<p>Understand how the addition relates to counting on in 10s across 100.</p>  $184 + 20 = ?$ <p><i>I can count in 10s ... 194 ... 204</i></p> $184 + 20 = 204$ <p>Use number bonds within 20 to support efficient mental calculations.</p> $385 + 50$ <p><i>There are 8 tens and 5 tens.</i></p> <p><i>That is 13 tens.</i></p> $385 + 50 = 300 + 130 + 5$ $385 + 50 = 435$
<p>3-digit number + 3-digit number, no exchange</p>	<p>Use place value equipment to make a representation of a calculation. This may or may not be structured in a place value grid.</p> <p>$326 + 541$ is represented as:</p> 	<p>Represent the place value grid with equipment to model the stages of column addition.</p> 	<p>Use a column method to solve efficiently, using known bonds. Children must understand how this relates to place value at every stage of the calculation.</p> 

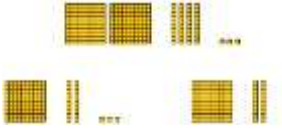
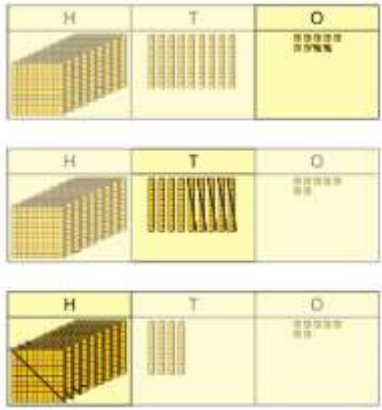
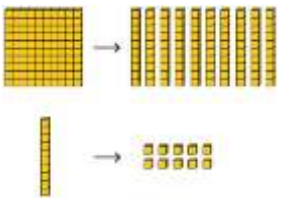
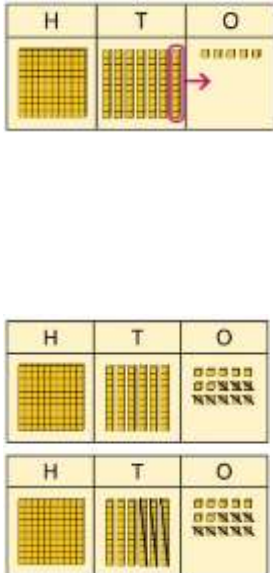
3-digit number + 3-digit number, exchange required	<p>Use place value equipment to enact the exchange required.</p>  <p>There are 13 ones. I will exchange 10 ones for 1 ten.</p>	<p>Model the stages of column addition using place value equipment on a place value grid.</p> 	<p>Use column addition, ensuring understanding of place value at every stage of the calculation.</p>  <p>$126 + 217 = 343$ Note: Children should also study examples where exchange is required in more than one column, for example $185 + 318 = ?$</p>
3-digit number + 2-digit number	<p>Use place value equipment to make and combine groups to model addition.</p> 	<p>Use a place value grid to organise thinking and adding of 1s, then 10s.</p>	<p>Use the vertical column method to represent the addition. Children must understand how this relates to place value at each stage of the calculation.</p>

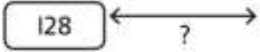
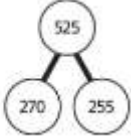
3-digit number + 2-digit number, exchange required	<p>Use place value equipment to model addition and understand where exchange is required.</p> <p><i>Use place value counters to represent</i> $154 + 72$.</p> <p><i>Use this to decide if any exchange is required.</i></p> <p><i>There are 5 tens and 7 tens. That is 12 tens so I will exchange.</i></p>	<p>Represent the required exchange on a place value grid using equipment.</p> <p>$275 + 16 = ?$</p>  <p>$275 + 16 = 291$</p> <p>Note: In this example, a mental method may be more efficient. The numbers for the example calculation have been chosen to allow children to visualise the concept and see how the method relates to place value. Children should be encouraged at every stage to select methods that are accurate and efficient.</p>	<p>Use a column method with exchange. Children must understand how the method relates to place value at each stage of the calculation.</p>  <p>$275 + 16 = 291$</p>
Representing addition problems	<p>Representing addition problems, and selecting appropriate methods</p> <p>Encourage children to use their own drawings and choices of place value equipment to represent problems with one or more steps.</p> <p>These representations will help them to select appropriate methods.</p>	<p>Children understand and create bar models to represent addition problems.</p> <p>$275 + 99 = ?$</p>  <p>$275 + 99 = 374$</p>	<p>Use representations to support choices of appropriate methods.</p>  <p><i>I will add 100, then subtract 1 to find the solution.</i></p> <p>$128 + 105 + 83 = ?$ <i>I need to add three numbers.</i></p>

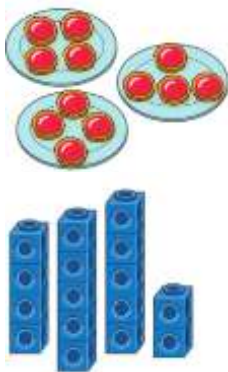
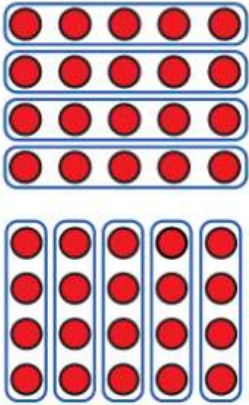
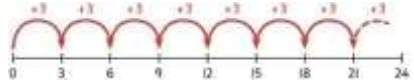
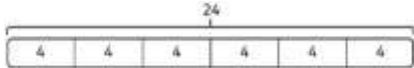
			$128 + 105 = 233$ <div style="text-align: center;"> 233 <div style="border: 1px solid black; padding: 2px; display: inline-block; margin: 0 auto; width: 150px;"> <div style="border-right: 1px solid black; padding: 0 10px;">128</div> <div style="border-right: 1px solid black; padding: 0 10px;">105</div> <div style="padding: 0 10px;">83</div> </div> 316 <div style="border: 1px solid black; padding: 2px; display: inline-block; margin: 0 auto; width: 150px;"> <div style="border-right: 1px solid black; padding: 0 10px;">233</div> <div style="padding: 0 10px;">83</div> </div> </div>
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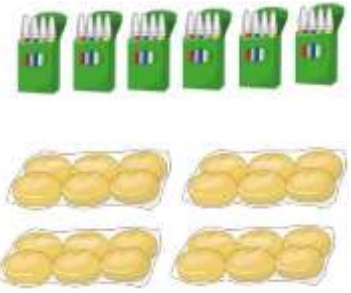
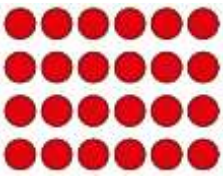
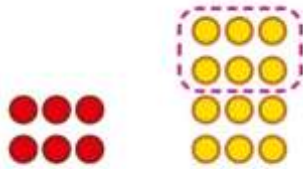
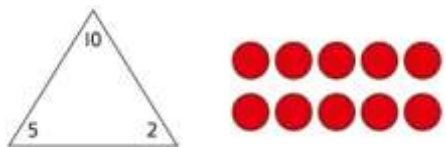
Year 3 Subtraction																					
	Concrete	Pictorial	Abstract																		
Subtracting 100s	<p>Use known facts and unitising to subtract multiples of 100.</p>  <p>$5 - 2 = 3$ $500 - 200 = 300$</p>	<p>Use known facts and unitising to subtract multiples of 100.</p>  <p>$4 - 2 = 2$ $400 - 200 = 200$</p>	<p>Understand the link with counting back in 100s.</p>  <p>$400 - 200 = 200$</p> <p>Use known facts and unitising as efficient and accurate methods.</p> <p><i>I know that $7 - 4 = 3$. Therefore, I know that $700 - 400 = 300$.</i></p>																		
3-digit number – 1s, no exchange	<p>Use number bonds to subtract the 1s.</p>  <p>$214 - 3 = ?$</p>  <p>$4 - 3 = 1$ $214 - 3 = 211$</p>	<p>Use number bonds to subtract the 1s.</p> <table border="1" data-bbox="563 1120 876 1299"><tr><td>H</td><td>T</td><td>O</td></tr><tr><td></td><td></td><td></td></tr><tr><td>3</td><td>1</td><td>4</td></tr></table> <p>$319 - 4 = ?$</p> <table border="1" data-bbox="563 1422 876 1601"><tr><td>H</td><td>T</td><td>O</td></tr><tr><td></td><td></td><td></td></tr><tr><td>3</td><td>1</td><td>9</td></tr></table> <p>$9 - 4 = 5$ $319 - 4 = 315$</p>	H	T	O				3	1	4	H	T	O				3	1	9	<p>Understand the link with counting back using a number line.</p> <p>Use known number bonds to calculate mentally.</p> <p>$476 - 4 = ?$</p>  <p>$6 - 4 = 2$ $476 - 4 = 472$</p>
H	T	O																			
3	1	4																			
H	T	O																			
3	1	9																			

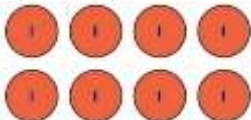
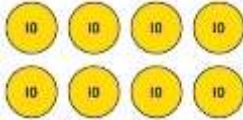
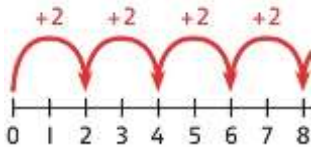
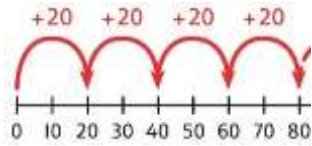
<p>3-digit number – 1s, exchange or bridging required</p>	<p>Understand why an exchange is necessary by exploring why 1 ten must be exchanged.</p> <p>Use place value equipment.</p>	<p>Represent the required exchange on a place value grid.</p> <p>$151 - 7 = ?$</p> 	<p>Calculate mentally by using known bonds.</p> <p>$151 - 7 = ?$</p> <p>$151 - 1 - 6 = 144$</p>
<p>3-digit number – 10s, no exchange</p>	<p>Subtract the 10s using known bonds.</p>  <p>$381 - 10 = ?$</p> <p><i>8 tens with 1 removed is 7 tens.</i></p> <p>$381 - 10 = 371$</p>	<p>Subtract the 10s using known bonds.</p>  <p>$8 \text{ tens} - 1 \text{ ten} = 7 \text{ tens}$</p> <p>$381 - 10 = 371$</p>	<p>Use known bonds to subtract the 10s mentally.</p> <p>$372 - 50 = ?$</p> <p>$70 - 50 = 20$</p> <p>So, $372 - 50 = 322$</p>
<p>3-digit number – 10s, exchange or bridging required</p>	<p>Use equipment to understand the exchange of 1 hundred for 10 tens.</p> 	<p>Represent the exchange on a place value grid using equipment.</p> <p>$210 - 20 = ?$</p>  <p><i>I need to exchange 1 hundred for 10 tens, to help subtract 2 tens.</i></p>  <p>$210 - 20 = 190$</p>	<p>Understand the link with counting back on a number line.</p> <p>Use flexible partitioning to support the calculation.</p> <p>$235 - 60 = ?$</p>  <p>$235 = 100 + 130 + 5$</p> <p>$235 - 60 = 100 + 70 + 5$ $= 175$</p>

3-digit number – up to 3-digit number	<p>Use place value equipment to explore the effect of splitting a whole into two parts, and understand the link with taking away.</p> 	<p>Represent the calculation on a place value grid.</p> 	<p>Use column subtraction to calculate accurately and efficiently.</p> 
3-digit number – up to 3-digit number, exchange required	<p>Use base 10 equipment to enact the exchange of 1 hundred for 10 tens, and 1 ten for 10 ones.</p> 	<p>Model the required exchange on a place value grid.</p> <p>$175 - 38 = ?$ <i>I need to subtract 8 ones, so I will exchange a ten for 10 ones.</i></p> 	<p>Use column subtraction to work accurately and efficiently.</p>  <p>If the subtraction is a 3-digit number subtract a 2-digit number, children should understand how the recording relates to the place value, and so how to line up the digits correctly. Children should also understand how to exchange in calculations where there is a zero in the 10s column.</p>

Representing subtraction problems		<p>Use bar models to represent subtractions.</p> <p>'Find the difference' is represented as two bars for comparison.</p> <div data-bbox="564 342 962 454"> <p>Team A </p> <p>Team B </p> </div> <p>Bar models can also be used to show that a part must be taken away from the whole.</p>	<p>Children use alternative representations to check calculations and choose efficient methods.</p> <p>Children use inverse operations to check additions and subtractions. The part-whole model supports understanding.</p> <p><i>I have completed this subtraction.</i> $525 - 270 = 255$ <i>I will check using addition.</i></p> <div data-bbox="1114 752 1489 887">   </div>
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	Year 3 Multiplication		
	Concrete	Pictorial	Abstract
Understanding equal grouping and repeated addition	<p>Children continue to build understanding of equal groups and the relationship with repeated addition. They recognise both examples and non-examples using objects.</p>  <p>Children recognise that arrays can be used to model commutative multiplications.</p>  <p><i>I can see 3 groups of 4. I can see 8 groups of 3.</i></p>	<p>Children recognise that arrays demonstrate commutativity.</p>  <p><i>This is 3 groups of 4. This is 4 groups of 3.</i></p>	<p>Children understand the link between repeated addition and multiplication.</p>  <p><i>8 groups of 3 is 24.</i></p> <p>$3 + 3 + 3 + 3 + 3 + 3 + 3 + 3 = 24$ $8 \times 3 = 24$</p> <p>A bar model may represent multiplications as equal groups.</p>  <p>$6 \times 4 = 24$</p>

<p>Using commutativity to support understanding of the times-tables</p>	<p>Understand how to use times-tables facts flexibly.</p>  <p>There are 6 groups of 4 pens. There are 4 groups of 6 bread rolls.</p> <p>I can use $6 \times 4 = 24$ to work out both totals.</p>	<p>Understand how times-table facts relate to commutativity.</p>  <p>$6 \times 4 = 24$ $4 \times 6 = 24$</p>	<p>Understand how times-table facts relate to commutativity.</p> <p>I need to work out 4 groups of 7.</p> <p>I know that $7 \times 4 = 28$</p> <p>so, I know that</p> <p>4 groups of 7 = 28 and 7 groups of 4 = 28.</p>
<p>Understanding and using $\times 3$, $\times 2$, $\times 4$ and $\times 8$ tables.</p>	<p>Children learn the times-tables as 'groups of' but apply their knowledge of commutativity.</p>  <p>I can use the $\times 3$ table to work out how many keys. I can also use the $\times 3$ table to work out how many batteries.</p>	<p>Children understand how the $\times 2$, $\times 4$ and $\times 8$ tables are related through repeated doubling.</p>  <p>$3 \times 2 = 6$ $3 \times 4 = 12$</p>	<p>Children understand the relationship between related multiplication and division facts in known times-tables.</p>  <p>$2 \times 5 = 10$ $5 \times 2 = 10$ $10 \div 5 = 2$ $10 \div 2 = 5$</p>

<p>Using known facts to multiply 10s, for example 3×40</p>	<p>Explore the relationship between known times-tables and multiples of 10 using place value equipment.</p> <p><i>Make 4 groups of 3 ones.</i></p>  <p><i>Make 4 groups of 3 tens.</i></p>  <p><i>What is the same?</i> <i>What is different?</i></p>	<p>Understand how unitising 10s supports multiplying by multiples of 10.</p>   <p><i>groups of 2 ones is 8 ones.</i> <i>4 groups of 2 tens is 8 tens.</i> $4 \times 2 = 8$ $4 \times 20 = 80$</p>	<p>Understand how to use known times-tables to multiply multiples of 10.</p>   <p>$4 \times 2 = 8$ $4 \times 20 = 80$</p>
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Understand how to link partitioning a 2-digit number with multiplying.

Each person has 23 flowers.

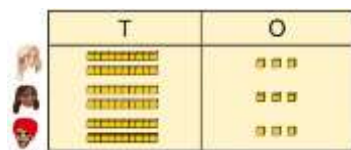
Each person has 2 tens and 3 ones.



There are 3 groups of 2 tens.

There are 3 groups of 3 ones.

Use place value equipment to model the multiplication context.



There are 3 groups of 3 ones.

There are 3 groups of 2 tens.

Use place value to support how partitioning is linked with multiplying by a 2-digit number.

$$3 \times 24 = ?$$

T	O
20	3
20	3
20	3

$$3 \times 4 = 12$$

T	O
12	12

$$3 \times 20 = 60$$

$$60 + 12 = 72$$

$$3 \times 24 = 72$$

Understand how to link partitioning a 2-digit number with multiplying.

Each person has 23 flowers.

Each person has 2 tens and 3 ones.



There are 3 groups of 2 tens.

There are 3 groups of 3 ones.

Use place value equipment to model the multiplication context.



T	O
20	3
20	3
20	3

There are 3 groups of 3 ones.

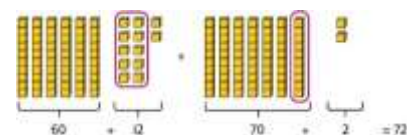
There are 3 groups of 2 tens.

Use place value equipment to model how 10 ones are exchanged for a 10 in some multiplications.

$$3 \times 24 = ?$$

$$3 \times 20 = 60$$

$$3 \times 4 = 12$$



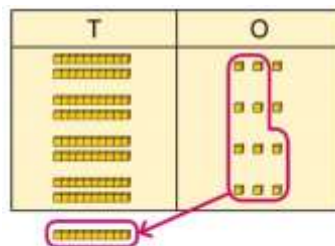
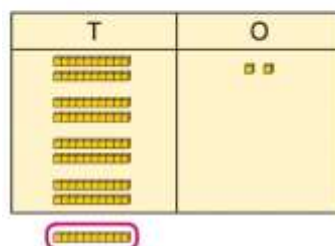
$$3 \times 24 = 60 + 12$$

$$3 \times 24 = 70 + 2$$

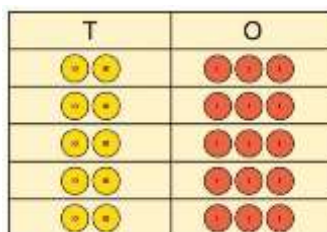
$$3 \times 24 = 72$$

Understand that multiplications may require an exchange of 1s for 10s, and also 10s for 100s.

$$4 \times 23 = ?$$



$$4 \times 23 = 92$$



$$5 \times 23 = ?$$

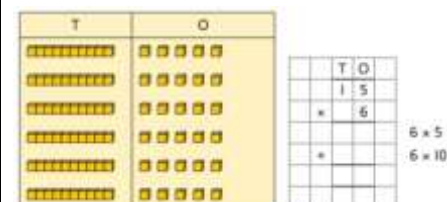
$$5 \times 3 = 15$$

$$5 \times 20 = 100$$

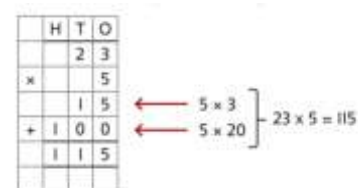
$$5 \times 23 = 115$$

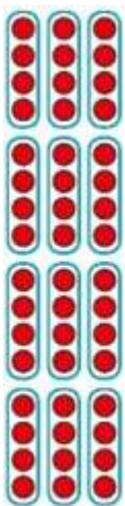
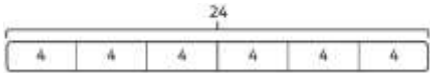
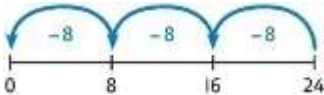
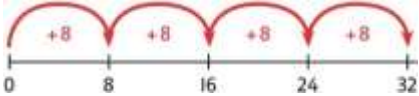
Children may write calculations in expanded column form, but must understand the link with place value and exchange.

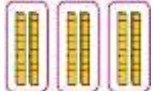
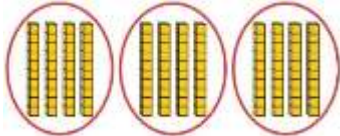
Children are encouraged to write the expanded parts of the calculation separately.

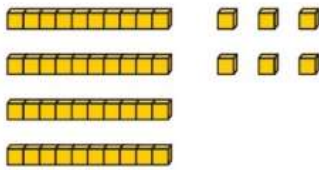
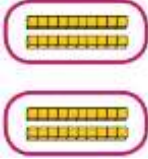
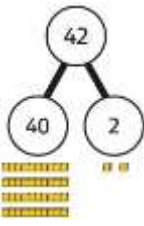
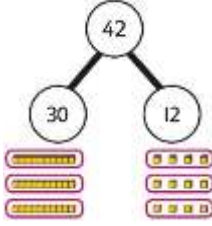
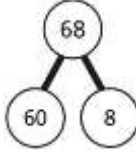


$$23 \times 5 = ?$$

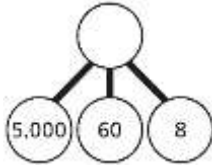
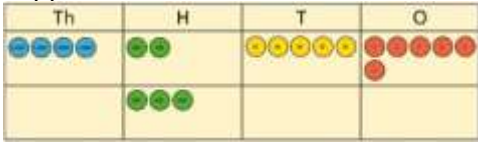


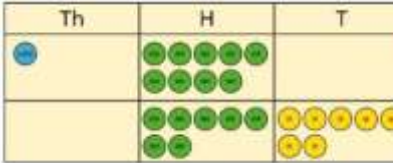
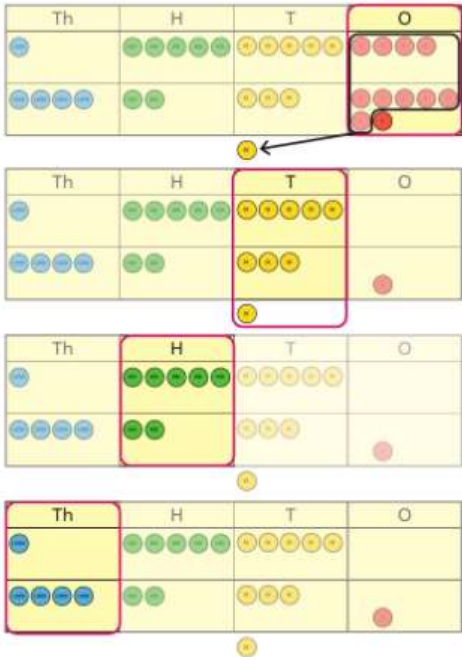
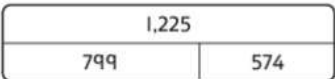
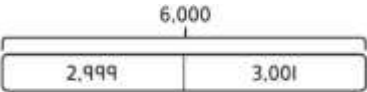
	Year 3 Division		
	Concrete	Pictorial	Abstract
Using times-tables knowledge to divide	<p>Use knowledge of known times-tables to calculate divisions.</p>  <p>24 divided into groups of 8. There are 3 groups of 8.</p>	<p>Use knowledge of known times-tables to calculate divisions.</p>  <p>$48 \div 4 = 12$</p> <p>48 divided into groups of 4. There are 12 groups.</p> <p>$4 \times 12 = 48$ $48 \div 4 = 12$</p>	<p>Use knowledge of known times-tables to calculate divisions.</p> <p><i>I need to work out 30 shared between 5.</i></p> <p><i>I know that $6 \times 5 = 30$ so I know that $30 \div 5 = 6$.</i></p> <p>A bar model may represent the relationship between sharing and grouping.</p>  <p>$24 \div 4 = 6$ $24 \div 6 = 4$</p> <p>Children understand how division is related to both repeated subtraction and repeated addition.</p>  <p>$24 \div 8 = 3$</p>  <p>$32 \div 8 = 4$</p>

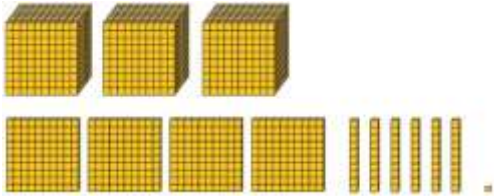
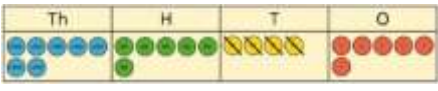
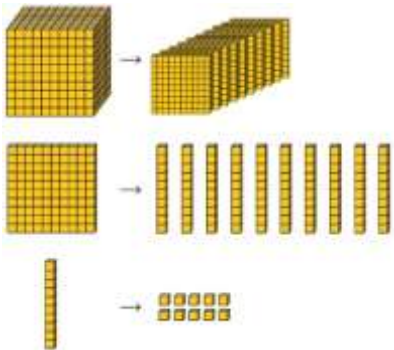
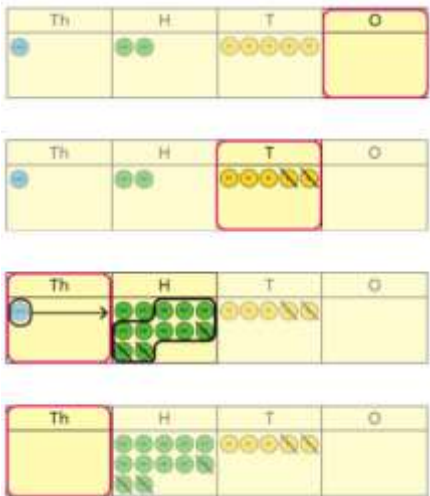
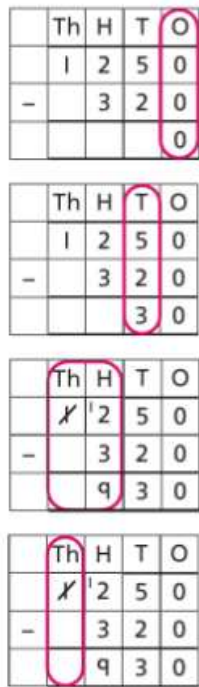
Understanding remainders	<p>Use equipment to understand that a remainder occurs when a set of objects cannot be divided equally any further.</p>  <p><i>There are 13 sticks in total. There are 3 groups of 4, with 1 remainder.</i></p>	<p>Use images to explain remainders.</p>  <p>$22 \div 5 = 4 \text{ remainder } 2$</p>	<p>Understand that the remainder is what cannot be shared equally from a set.</p> <p>$22 \div 5 = ?$</p> <p>$3 \times 5 = 15$ $4 \times 5 = 20$ $5 \times 5 = 25 \dots \text{this is larger than } 22$ So, $22 \div 5 = 4 \text{ remainder } 2$</p>
Using known facts to divide multiples of 10	<p>Use place value equipment to understand how to divide by unitising.</p> <p><i>Make 6 ones divided by 3.</i></p>  <p><i>Now make 6 tens divided by 3.</i></p>  <p><i>What is the same? What is different?</i></p>	<p>Divide multiples of 10 by unitising.</p>  <p><i>12 tens shared into 3 equal groups. 4 tens in each group.</i></p>	<p>Divide multiples of 10 by a single digit using known times-tables.</p> <p>$180 \div 3 = ?$</p> <p><i>180 is 18 tens.</i></p> <p><i>18 divided by 3 is 6. 18 tens divided by 3 is 6 tens.</i></p> <p>$18 \div 3 = 6$ $180 \div 3 = 60$</p>

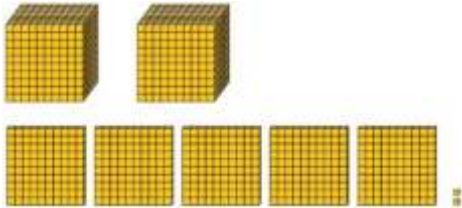
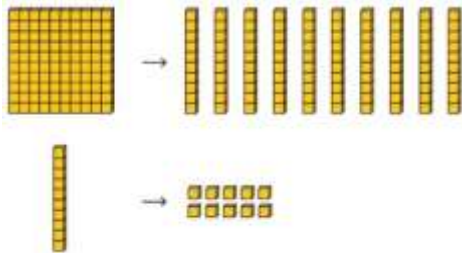
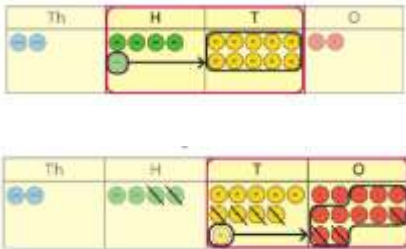
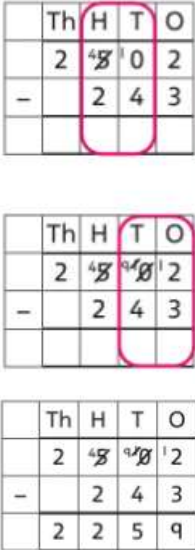
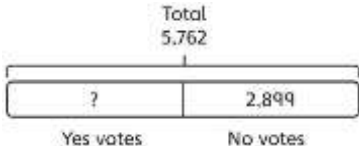
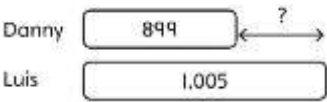
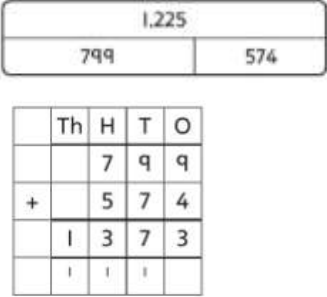
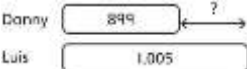
2-digit number divided by 1-digit number, no remainders	<p>Children explore dividing 2-digit numbers by using place value equipment.</p>  <p>$48 \div 2 = ?$</p> <p>First divide the 10s.</p>  <p>Then divide the 1s.</p> 	<p>Children explore which partitions support particular divisions.</p>  <p><i>I need to partition 42 differently to divide by 3.</i></p>  <p>$42 = 30 + 12$</p> <p>$42 \div 3 = 14$</p>	<p>Children partition a number into 10s and 1s to divide where appropriate.</p>  <p>$60 \div 2 = 30$</p> <p>$8 \div 2 = 4$</p> <p>$68 \div 2 = 34$</p> <p>Children partition flexibly to divide where appropriate.</p> <p>$42 \div 3 = ?$</p> <p>$42 = 40 + 2$</p> <p><i>I need to partition 42 differently to divide by 3.</i></p> <p>$42 = 30 + 12$</p> <p>$30 \div 3 = 10$</p> <p>$12 \div 3 = 4$</p> <p>$10 + 4 = 14$</p> <p>$42 \div 3 = 14$</p>
2-digit number divided by 1-digit number, with remainders	<p>Use place value equipment to understand the concept of remainder.</p> <p>Make 29 from place value equipment. Share it into 2 equal groups.</p>  <p>There are two groups of 14 and 1 remainder.</p>	<p>Use place value equipment to understand the concept of remainder in division.</p> <p>$29 \div 2 = ?$</p>  <p>$29 \div 2 = 14 \text{ remainder } 1$</p>	<p>Partition to divide, understanding the remainder in context.</p> <p>67 children try to make 5 equal lines.</p> <p>$67 = 50 + 17$</p> <p>$50 \div 5 = 10$</p> <p>$17 \div 5 = 3 \text{ remainder } 2$</p> <p>$67 \div 5 = 13 \text{ remainder } 2$</p> <p>There are 13 children in each line and 2 children left out.</p>

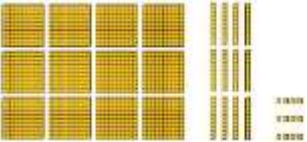
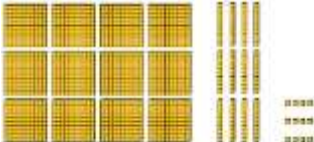
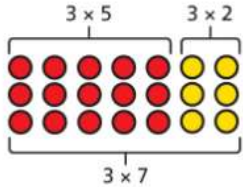
Year 4 four operations

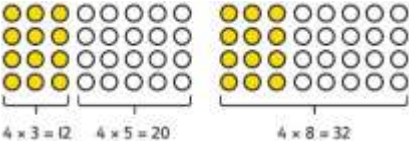
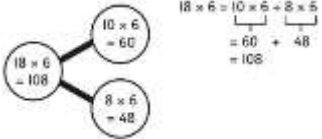
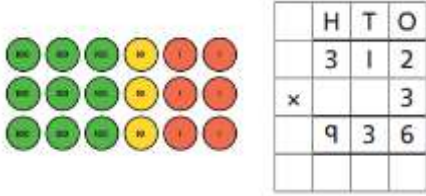
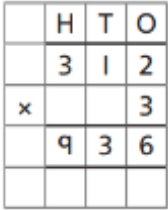
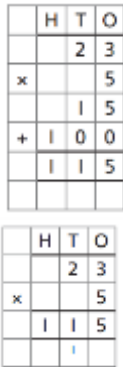
	Year 4 Addition		
	Concrete	Pictorial	Abstract
Understanding numbers to 10,000	<p>Use place value equipment to understand the place value of 4-digit numbers.</p>  <p>4 thousands equal 4,000.</p> <p>1 thousand is 10 hundreds.</p>	<p>Represent numbers using place value counters once children understand the relationship between 1,000s and 100s.</p>  <p>$2,000 + 500 + 40 + 2 = 2,542$</p>	<p>Understand partitioning of 4-digit numbers, including numbers with digits of 0.</p>  <p>$5,000 + 60 + 8 = 5,068$</p> <p>Understand and read 4-digit numbers on a number line.</p> 
Choosing mental methods where appropriate	<p>Use unitising and known facts to support mental calculations.</p> <p>Make 1,405 from place value equipment.</p> <p>Add 2,000.</p> <p>Now add the 1,000s.</p> <p>1 thousand + 2 thousands = 3 thousands</p> <p>$1,405 + 2,000 = 3,405$</p>	<p>Use unitising and known facts to support mental calculations.</p>  <p>I can add the 100s mentally.</p> <p>$200 + 300 = 500$ So, $4,256 + 300 = 4,556$</p>	<p>Use unitising and known facts to support mental calculations.</p> <p>$4,256 + 300 = ?$</p> <p>$2 + 3 = 5$ $200 + 300 = 500$</p> <p>$4,256 + 300 = 4,556$</p>

<p>Column addition</p>	<p>Use place value equipment on a place value grid to organise thinking.</p> <p>Ensure that children understand how the columns relate to place value and what to do if the numbers are not all 4-digit numbers.</p> <p><i>Use equipment to show $1,905 + 775$.</i></p>  <p><i>Why have only three columns been used for the second row? Why is the Thousands box empty?</i></p> <p><i>Which columns will total 10 or more?</i></p>	<p>Use place value equipment to model required exchanges.</p>  <p>Include examples that exchange in more than one column.</p>	<p>Use a column method to add, including exchanges.</p>  <p>Include examples that exchange in more than one column.</p>
<p>Representing additions and checking strategies</p>		<p>Bar models may be used to represent additions in problem contexts, and to justify mental methods where appropriate.</p>   <p><i>I chose to work out $574 + 800$, then subtract 1.</i></p>  <p><i>This is equivalent to $3,000 + 3,000$.</i></p>	<p>Use rounding and estimating on a number line to check the reasonableness of an addition.</p>  <p>$912 + 6,149 = ?$</p> <p><i>I used rounding to work out that the answer should be approximately $1,000 + 6,000 = 7,000$.</i></p>

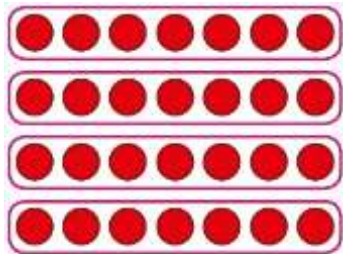
	Year 4 Subtraction		
	Concrete	Pictorial	Abstract
Choosing mental methods where appropriate	<p>Use place value equipment to justify mental methods.</p>  <p>What number will be left if we take away 300?</p>	<p>Use place value grids to support mental methods where appropriate.</p>  <p>$7,646 - 40 = 7,606$</p>	<p>Use knowledge of place value and unitising to subtract mentally where appropriate.</p> <p>$3,501 - 2,000$</p> <p>3 thousands - 2 thousands = 1 thousand</p> <p>$3,501 - 2,000 = 1,501$</p>
Column subtraction	<p>Understand why exchange of a 1,000 for 100s, a 100 for 10s, or a 10 for 1s may be necessary.</p> 	<p>Represent place value equipment on a place value grid to subtract, including exchanges where needed.</p> 	<p>Use column subtraction, with understanding of the place value of any exchange required.</p> 

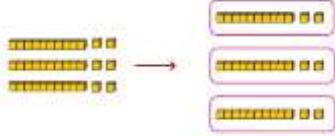
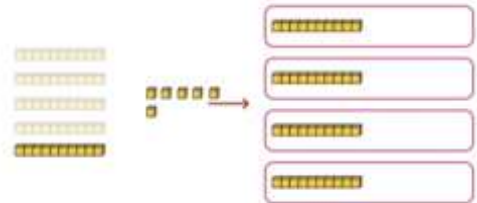
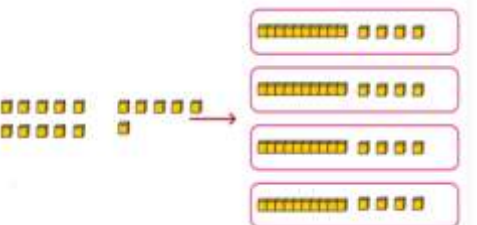
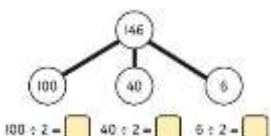
<p>Column subtraction with exchange across more than one column</p>	<p>Understand why two exchanges may be necessary.</p> <p>$2,502 - 243 = ?$</p>  <p>I need to exchange a 10 for some 1s, but there are not any 10s here.</p> 	<p>Make exchanges across more than one column where there is a zero as a place holder.</p> <p>$2,502 - 243 = ?$</p> 	<p>Make exchanges across more than one column where there is a zero as a place holder.</p> <p>$2,502 - 243 = ?$</p> 
<p>Representing subtractions and checking strategies</p>	<p>Use bar models to represent subtractions where a part needs to be calculated.</p>  <p>I can work out the total number of Yes votes using $5,762 - 2,899$.</p> <p>Bar models can also represent 'find the difference' as a subtraction problem.</p> 	<p>Use inverse operations to check subtractions.</p> <p>I calculated $1,225 - 799 = 574$. I will check by adding the parts.</p>  <p>The parts do not add to make 1,225. I must have made a mistake.</p>	<p>Use bar models to represent subtractions where a part needs to be calculated.</p>  <p>I can work out the total number of Yes votes using $5,762 - 2,899$.</p> <p>Bar models can also represent 'find the difference' as a subtraction problem.</p> 

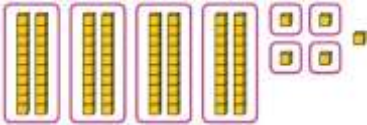
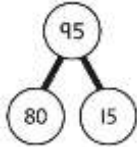
	Year 4 Multiplication		
	Concrete	Pictorial	Abstract
Multiplying by multiples of 10 and 100	<p>Use unitising and place value equipment to understand how to multiply by multiples of 1, 10 and 100.</p>  <p>3 groups of 4 ones is 12 ones. 3 groups of 4 tens is 12 tens. 3 groups of 4 hundreds is 12 hundreds.</p>	<p>Use unitising and place value equipment to understand how to multiply by multiples of 1, 10 and 100.</p>  <p>$3 \times 4 = 12$ $3 \times 40 = 120$ $3 \times 400 = 1,200$</p>	<p>Use known facts and understanding of place value and commutativity to multiply mentally.</p> <p>$4 \times 7 = 28$ $4 \times 70 = 280$ $40 \times 7 = 280$ $4 \times 700 = 2,800$ $400 \times 7 = 2,800$</p>
Understanding times-tables up to 12×12	<p>Understand the special cases of multiplying by 1 and 0.</p>  <p>$5 \times 1 = 5$ $5 \times 0 = 0$</p>	<p>Represent the relationship between the $\times 9$ table and the $\times 10$ table.</p>  <p>Represent the $\times 11$ table and $\times 12$ tables in relation to the $\times 10$ table.</p>  <p>$2 \times 11 = 20 + 2$ $3 \times 11 = 30 + 3$ $4 \times 11 = 40 + 4$</p>  <p>$4 \times 12 = 40 + 8$</p>	<p>Understand how times-tables relate to counting patterns.</p> <p>Understand links between the $\times 3$ table, $\times 6$ table and $\times 9$ table 5×6 is double 5×3</p> <p>$\times 5$ table and $\times 6$ table I know that $7 \times 5 = 35$ so I know that $7 \times 6 = 35 + 7$.</p> <p>$\times 5$ table and $\times 7$ table $3 \times 7 = 3 \times 5 + 3 \times 2$</p>  <p>$\times 9$ table and $\times 10$ table $6 \times 10 = 60$ $6 \times 9 = 60 - 6$</p>

<p>Understanding and using partitioning</p>	<p>Make multiplications by partitioning.</p> <p>4×12 is 4 groups of 10 and 4 groups of 2.</p>  <p>$4 \times 12 = 40 + 8$</p>	<p>Understand how multiplication and partitioning are related through addition.</p>  <p>$4 \times 3 = 12$ $4 \times 5 = 20$ $12 + 20 = 32$</p> <p>$4 \times 8 = 32$</p>	<p>Use partitioning to multiply 2-digit numbers by a single digit.</p> <p>$18 \times 6 = ?$</p>  <p>$18 \times 6 = 10 \times 6 + 8 \times 6$ $= 60 + 48$ $= 108$</p>																																																																								
<p>Column multiplication for 2- and 3-digit numbers multiplied by a single digit</p>	<p>Use place value equipment to make multiplications.</p> <p>Make 4×136 using equipment.</p>  <p>I can work out how many 1s, 10s and 100s.</p> <p>There are 4×6 ones... 24 ones</p> <p>There are 4×3 tens ... 12 tens</p> <p>There are 4×1 hundreds ... 4 hundreds</p> <p>$24 + 120 + 400 = 544$</p>	<p>Use place value equipment alongside a column method for multiplication of up to 3-digit numbers by a single digit.</p>  <table border="1" data-bbox="911 898 1066 1093"> <thead> <tr><th></th><th>H</th><th>T</th><th>O</th></tr> </thead> <tbody> <tr><td></td><td>3</td><td>1</td><td>2</td></tr> <tr><td>x</td><td></td><td></td><td>3</td></tr> <tr><td></td><td>9</td><td>3</td><td>6</td></tr> </tbody> </table>		H	T	O		3	1	2	x			3		9	3	6	<p>Use the formal column method for up to 3-digit numbers multiplied by a single digit.</p>  <table border="1" data-bbox="1190 925 1358 1133"> <thead> <tr><th></th><th>H</th><th>T</th><th>O</th></tr> </thead> <tbody> <tr><td></td><td>3</td><td>1</td><td>2</td></tr> <tr><td>x</td><td></td><td></td><td>3</td></tr> <tr><td></td><td>9</td><td>3</td><td>6</td></tr> </tbody> </table> <p>Understand how the expanded column method is related to the formal column method and understand how any exchanges are related to place value at each stage of the calculation.</p>  <table border="1" data-bbox="1182 1630 1305 1995"> <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>3</td></tr> <tr><td>x</td><td></td><td></td><td>5</td></tr> <tr><td></td><td></td><td>1</td><td>5</td></tr> <tr><td>+</td><td>1</td><td>0</td><td>0</td></tr> <tr><td></td><td>1</td><td>1</td><td>5</td></tr> </tbody> </table> <table border="1" data-bbox="1182 1854 1305 1995"> <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>3</td></tr> <tr><td>x</td><td></td><td></td><td>5</td></tr> <tr><td></td><td>1</td><td>1</td><td>5</td></tr> </tbody> </table>		H	T	O		3	1	2	x			3		9	3	6		H	T	O			2	3	x			5			1	5	+	1	0	0		1	1	5		H	T	O			2	3	x			5		1	1	5
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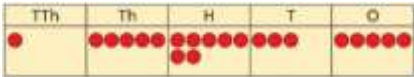
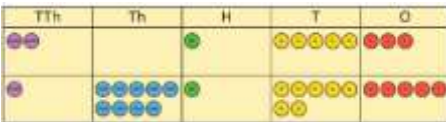
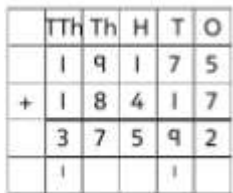
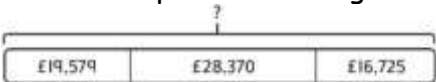
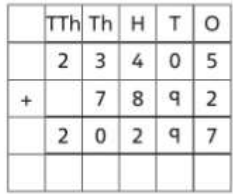
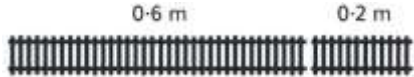
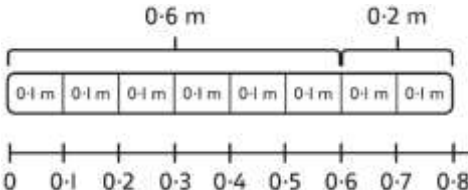
<p>Multiplying more than two numbers</p>	<p>Represent situations by multiplying three numbers together.</p>  <p>Each sheet has 2×5 stickers. There are 3 sheets.</p> <p>There are $5 \times 2 \times 3$ stickers in total.</p> $\begin{array}{l} 5 \times 2 \times 3 = 30 \\ \hline 10 \times 3 = 30 \end{array}$	<p>Understand that commutativity can be used to multiply in different orders.</p>  $2 \times 6 \times 10 = 120$ $12 \times 10 = 120$ $10 \times 6 \times 2 = 120$ $60 \times 2 = 120$	<p>Use knowledge of factors to simplify some multiplications.</p> $24 \times 5 = 12 \times 2 \times 5$ $12 \times 2 \times 5 =$ $\begin{array}{l} \hline 12 \times 10 = 120 \end{array}$ <p>So, $24 \times 5 = 120$</p>
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	Year 4 Division		
	Concrete	Pictorial	Abstract
<p>Understanding the relationship between multiplication and division, including times-tables</p>	<p>Use objects to explore families of multiplication and division facts.</p>  $4 \times 6 = 24$ <p>24 is 6 groups of 4. 24 is 4 groups of 6.</p> <p>24 divided by 6 is 4. 24 divided by 4 is 6.</p>	<p>Represent divisions using an array.</p>  $28 \div 7 = 4$	<p>Understand families of related multiplication and division facts.</p> <p>I know that $5 \times 7 = 35$</p> <p>so I know all these facts:</p> $5 \times 7 = 35$ $7 \times 5 = 35$ $35 = 5 \times 7$ $35 = 7 \times 5$ $35 \div 5 = 7$ $35 \div 7 = 5$ $7 = 35 \div 5$ $5 = 35 \div 7$

Dividing multiples of 10 and 100 by a single digit	<p>Use place value equipment to understand how to use unitising to divide.</p>  <p><i>8 ones divided into 2 equal groups 4 ones in each group</i></p> <p><i>8 tens divided into 2 equal groups 4 tens in each group</i></p> <p><i>8 hundreds divided into 2 equal groups 4 hundreds in each group</i></p>	<p>Represent divisions using place value equipment.</p> <p>$9 \div 3 = \square$</p>  <p>$90 \div 3 = \square$</p>  <p>$900 \div 3 = \square$</p>  <p>$9 \div 3 = 3$</p> <p><i>9 tens divided by 3 is 3 tens. 9 hundreds divided by 3 is 3 hundreds.</i></p>	<p>Use known facts to divide 10s and 100s by a single digit.</p> <p>$15 \div 3 = 5$</p> <p>$150 \div 3 = 50$</p> <p>$1500 \div 3 = 500$</p>
Divide by sharing	<p>Share using place value equipment</p> <p><i>36 shared equally between 3 groups</i></p>  <p>$36 \div 3 = 12$</p>	<p>Share by exchanging</p> <p><i>56 shared equally between 4 groups</i></p> <p><i>First share the 10s.</i></p>  <p><i>Exchange 1 ten for 1s, then share all the 1s.</i></p>  <p>$56 \div 4 = 14$</p>	<p>Share using known facts and partitioning where appropriate</p> <p>$142 \div 2 = ?$</p>  <p>$100 \div 2 = \square$ $40 \div 2 = \square$ $2 \div 2 = \square$</p> <p>$100 \div 2 = 50$ $40 \div 2 = 20$ $2 \div 2 = 1$ $50 + 20 + 1 = 71$ $142 \div 2 = 71$</p>

<p>Understanding remainders</p>	<p>Use place value equipment to find remainders.</p> <p><i>85 shared into 4 equal groups</i></p> <p><i>There are 24, and 1 that cannot be shared.</i></p> 	<p>Represent the remainder as the part that cannot be shared equally.</p>  <p>$72 \div 5 = 14 \text{ remainder } 2$</p>	<p>Understand how partitioning can reveal remainders of divisions.</p>  <p>$80 \div 4 = 20$</p> <p>$12 \div 4 = 3$</p> <p>$95 \div 4 = 23 \text{ remainder } 3$</p>
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Year 5 four operations

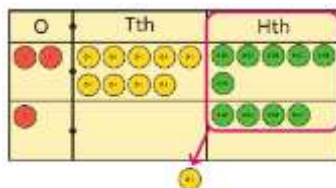
	Year 5 Addition		
	Concrete	Pictorial	Abstract
Column addition with whole numbers	<p>Use place value equipment to represent additions.</p>  <p><i>Add a row of counters onto the place value grid to show 15,735 + 4,012.</i></p>	<p>Represent additions, using place value equipment on a place value grid alongside written methods.</p>  <p><i>I need to exchange 10 tens for a 100.</i></p> 	<p>Use column addition, including exchanges.</p> 
Representing additions		<p>Bar models represent addition of two or more numbers in the context of problem solving.</p>  <p>Jen: £2,600 Holly: £2,600 + £1,450 = £4,050</p>  	<p>Use approximation to check whether answers are reasonable.</p>  <p><i>I will use 23,000 + 8,000 to check.</i></p>
Adding tenths	<p>Link measure with addition of decimals.</p> <p><i>Two lengths of fencing are 0.6 m and 0.2 m. How long are they when added together?</i></p> 	<p>Use a bar model with a number line to add tenths.</p>  <p>$0.6 + 0.2 = 0.8$ <i>6 tenths + 2 tenths = 8 tenths</i></p>	<p>Understand the link with adding fractions.</p> $\frac{6}{10} + \frac{2}{10} = \frac{8}{10}$ <p><i>6 tenths + 2 tenths = 8 tenths</i></p> <p>$0.6 + 0.2 = 0.8$</p>

Use place value equipment to represent additions.

Show $0.23 + 0.45$ using place value counters.

Use place value equipment on a place value grid to represent additions.

Represent exchange where necessary.



Include examples where the numbers of decimal places are different.

	O	Tth	Hth
	2	9	6
+	1	0	4
			0



	O	Tth	Hth
	5	0	0
+	1	2	5
	6	2	5

Add using a column method, ensuring that children understand the link with place value.

	O	Tth	Hth
	0	2	3
+	0	4	5
	0	6	8

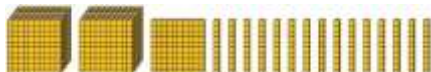
Include exchange where required,

	O	Tth	Hth
	0	5	7
+	0	4	3
	1	0	0

alongside an understanding of place value.

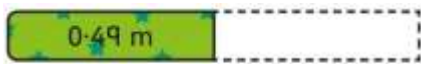
Include additions where the numbers of decimal places are different.

	O	Tth	Hth
	2	3	1
+	0	7	0

Year 5 Subtraction																																																																																																																																																									
	Concrete	Pictorial	Abstract																																																																																																																																																						
Column subtraction with whole numbers	<p>Use place value equipment to understand where exchanges are required.</p> <p>$2,250 - 1,070 = ?$</p> 	<p>Represent the stages of the calculation using place value equipment on a grid alongside the calculation, including exchanges where required.</p> <p>$15,735 - 2,582 = 13,153$</p> <div><table><tr><th>TTh</th><th>Th</th><th>H</th><th>T</th><th>O</th></tr><tr><td>●</td><td>●●●●●</td><td>●●●●●</td><td>●●●●●</td><td>●●●●●</td></tr></table><p>Now subtract the 10s. Exchange 1 hundred for 10 tens.</p><table><tr><th>TTh</th><th>Th</th><th>H</th><th>T</th><th>O</th></tr><tr><td>●</td><td>●●●●●</td><td>●●●●●</td><td>●●●●●●●●●●</td><td>●●●●●</td></tr></table><p>Subtract the 100s, 1,000s and 10,000s.</p><table><tr><th>TTh</th><th>Th</th><th>H</th><th>T</th><th>O</th></tr><tr><td>●</td><td>●●●●●</td><td>●●●●●</td><td>●●●●●●●●●●</td><td>●●●●●</td></tr></table></div> <div><table><tr><th></th><th>TTh</th><th>Th</th><th>H</th><th>T</th><th>O</th></tr><tr><td></td><td>1</td><td>5</td><td>7</td><td>3</td><td>5</td></tr><tr><td>-</td><td></td><td>2</td><td>5</td><td>8</td><td>2</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td>3</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></table><table><tr><th></th><th>TTh</th><th>Th</th><th>H</th><th>T</th><th>O</th></tr><tr><td></td><td>1</td><td>5</td><td>⁶7</td><td>¹3</td><td>5</td></tr><tr><td>-</td><td></td><td>2</td><td>5</td><td>8</td><td>2</td></tr><tr><td></td><td></td><td></td><td></td><td>5</td><td>3</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></table><table><tr><th></th><th>TTh</th><th>Th</th><th>H</th><th>T</th><th>O</th></tr><tr><td></td><td>1</td><td>5</td><td>⁶7</td><td>¹3</td><td>5</td></tr><tr><td>-</td><td></td><td>2</td><td>5</td><td>8</td><td>2</td></tr><tr><td></td><td>1</td><td>3</td><td>1</td><td>5</td><td>3</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></table></div>	TTh	Th	H	T	O	●	●●●●●	●●●●●	●●●●●	●●●●●	TTh	Th	H	T	O	●	●●●●●	●●●●●	●●●●●●●●●●	●●●●●	TTh	Th	H	T	O	●	●●●●●	●●●●●	●●●●●●●●●●	●●●●●		TTh	Th	H	T	O		1	5	7	3	5	-		2	5	8	2						3								TTh	Th	H	T	O		1	5	⁶ 7	¹ 3	5	-		2	5	8	2					5	3								TTh	Th	H	T	O		1	5	⁶ 7	¹ 3	5	-		2	5	8	2		1	3	1	5	3							<p>Use column subtraction methods with exchange where required.</p> <table><tr><th></th><th>TTh</th><th>Th</th><th>H</th><th>T</th><th>O</th></tr><tr><td></td><td>⁵1</td><td>¹2</td><td>5</td><td>9</td><td>7</td></tr><tr><td>-</td><td></td><td>1</td><td>8</td><td>0</td><td>3</td></tr><tr><td></td><td></td><td>4</td><td>4</td><td>5</td><td>6</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td>3</td></tr></table> <p>$62,597 - 18,034 = 44,563$</p>		TTh	Th	H	T	O		⁵ 1	¹ 2	5	9	7	-		1	8	0	3			4	4	5	6						3
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		<p>Bar models represent subtractions in problem contexts, including 'find the difference'.</p>	<p>Children can explain the mistake made when the columns have not been ordered correctly.</p> <p>Use approximation to check calculations.</p>																																																																																																																																																						

Checking strategies and representing subtractions		<div><div>Athletics Stadium</div><div>Hockey Centre</div><div>Velodrome</div></div> <div><div>75,450</div><div></div><div>15,735</div></div> <div><div></div><div>42,300</div><div>?</div></div>	<div>Bella's working</div> <table><tr><td></td><td>TTh</td><td>Th</td><td>H</td><td>T</td><td>O</td></tr><tr><td></td><td>1</td><td>7</td><td>8</td><td>7</td><td>7</td></tr><tr><td>+</td><td>4</td><td>0</td><td>1</td><td>2</td><td></td></tr><tr><td></td><td>5</td><td>7</td><td>9</td><td>9</td><td>7</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> <div>Correct method</div> <table><tr><td></td><td>TTh</td><td>Th</td><td>H</td><td>T</td><td>O</td></tr><tr><td></td><td>1</td><td>7</td><td>8</td><td>7</td><td>7</td></tr><tr><td>+</td><td></td><td>4</td><td>0</td><td>1</td><td>2</td></tr><tr><td></td><td>2</td><td>1</td><td>8</td><td>8</td><td>9</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> <div>I calculated 18,000 + 4,000 mentally to check my subtraction.</div>		TTh	Th	H	T	O		1	7	8	7	7	+	4	0	1	2			5	7	9	9	7								TTh	Th	H	T	O		1	7	8	7	7	+		4	0	1	2		2	1	8	8	9						
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Choosing efficient methods			<div>To subtract two large numbers that are close, children find the difference by counting on.</div> <div>2,002 - 1,995 = ?</div> <div><div>1,995</div><div>2,000</div><div>2,002</div></div> <div>Use addition to check subtractions.</div> <div>I calculated 7,546 - 2,355 = 5,191.</div> <div>I will check using the inverse.</div>																																																												

Explore complements to a whole number by working in the context of length.



$$1 \text{ m} - \boxed{} \text{ m} = \boxed{} \text{ m}$$

$$1 - 0.49 = ?$$

Use a place value grid to represent the stages of column subtraction, including exchanges where required.

$$5.74 - 2.25 = ?$$



Exchange 1 tenth for 10 hundredths.



Now subtract the 5 hundredths.



Now subtract the 2 tenths, then the 2 ones.



	O	Tth	Hth
5	7	4	
-	2	2	5

	O	Tth	Hth
5	6	14	
-	2	2	5

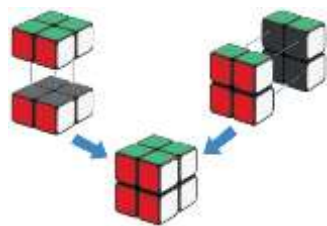
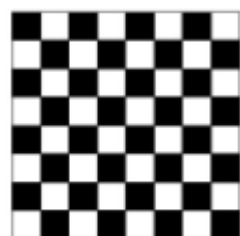
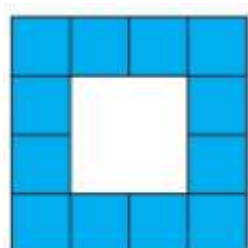
	O	Tth	Hth
5	6	14	
-	2	2	5
			9

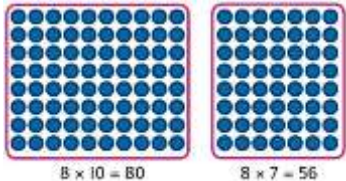
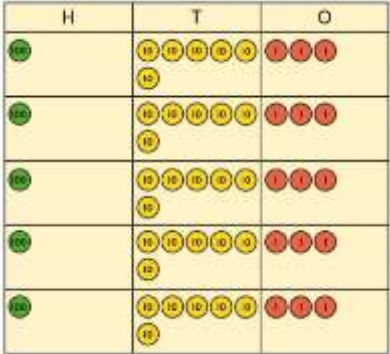
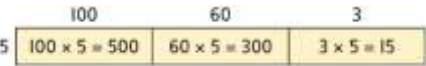
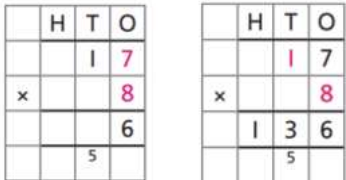
	O	Tth	Hth
5	6	14	
-	2	2	5
	3	4	9

Use column subtraction, with an understanding of place value, including subtracting numbers with different numbers of decimal places.

$$2.000 - 0.296 = ?$$

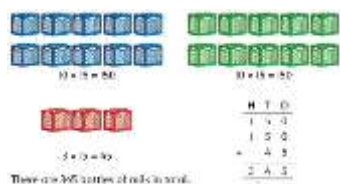
	O	Tth	Hth	Thth
2	0	0	0	0
-	0	2	9	6
	1	7	0	4

Year 5 Multiplication															
	Concrete	Pictorial	Abstract												
Understanding factors	<p>Use cubes or counters to explore the meaning of 'square numbers'.</p> <p><i>25 is a square number because it is made from 5 rows of 5.</i></p>  <p>Use cubes to explore cube numbers.</p>  <p><i>8 is a cube number.</i></p>	<p>Use images to explore examples and non-examples of square numbers.</p>  <p>$8 \times 8 = 64$ $8^2 = 64$</p>  <p><i>12 is not a square number, because you cannot multiply a whole number by itself to make 12.</i></p>	<p>Understand the pattern of square numbers in the multiplication tables.</p> <p><i>Use a multiplication grid to circle each square number. Can children spot a pattern?</i></p>												
	Multiplying by 10, 100 and 1,000	<p>Use place value equipment to multiply by 10, 100 and 1,000 by unitising.</p> <table border="1"><tr><td>$4 \times 1 = 4$ ones = 4</td><td></td></tr><tr><td>$4 \times 10 = 4$ tens = 40</td><td></td></tr><tr><td>$4 \times 100 = 4$ hundreds = 400</td><td></td></tr></table>	$4 \times 1 = 4$ ones = 4		$4 \times 10 = 4$ tens = 40		$4 \times 100 = 4$ hundreds = 400		<p>Understand the effect of repeated multiplication by 10.</p>  <p>$7 \times 10 = 70$ $7 \times 100 = 7,000$ $7 \times 1,000 = 70,000$</p>	<p>Understand how exchange relates to the digits when multiplying by 10, 100 and 1,000.</p> <table border="1"><tr><td>H</td><td>T</td><td>O</td></tr><tr><td></td><td>I</td><td>7</td></tr></table> <p>$17 \times 10 = 170$ $17 \times 100 = 17 \times 10 \times 10 = 1,700$ $17 \times 1,000 = 17 \times 10 \times 10 \times 10 = 17,000$</p>	H	T	O		I
$4 \times 1 = 4$ ones = 4															
$4 \times 10 = 4$ tens = 40															
$4 \times 100 = 4$ hundreds = 400															
H	T	O													
	I	7													

<p>Multiplying by 10, 100 and 1,000</p>	<p>Use place value equipment to explore multiplying by unitising.</p>  <p>5 groups of 3 ones is 15 ones. 5 groups of 3 tens is 15 tens. So, I know that 5 groups of 3 thousands would be 15 thousands.</p>	<p>Use place value equipment to represent how to multiply by multiples of 10, 100 and 1,000.</p>  <p>$4 \times 3 = 12$ $6 \times 4 = 24$ $4 \times 300 = 1,200$ $6 \times 400 = 2,400$</p>	<p>Use known facts and unitising to multiply.</p> <p>$5 \times 4 = 20$ $5 \times 40 = 200$ $5 \times 400 = 2,000$ $5 \times 4,000 = 20,000$ $5,000 \times 4 = 20,000$</p>
<p>Multiplying up to 4-digit numbers by a single digit</p>	<p>Explore how to use partitioning to multiply efficiently.</p> <p>$8 \times 17 = ?$</p>  <p>So, $8 \times 17 = 136$</p>	<p>Represent multiplications using place value equipment and add the 1s, then 10s, then 100s, then 1,000s.</p> 	<p>Use an area model and then add the parts.</p>  <p>Use a column multiplication, including any required exchanges.</p> 

Partition one number into 10s and 1s, then add the parts.

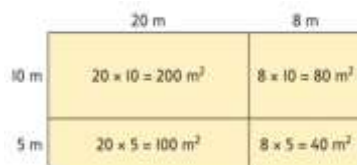
$$23 \times 15 = ?$$



$$23 \times 15 = 345$$

Use an area model and add the parts.

$$28 \times 15 = ?$$



	H	T	O
	2	0	0
	1	0	0
		8	0
+		4	0
	4	2	0
	1		

$$28 \times 15 = 420$$

Use column multiplication, ensuring understanding of place value at each stage.

		3	4
x		2	7
	2	3	8
	6	8	0
	9	1	8

$$34 \times 7$$

$$34 \times 20$$

$$34 \times 27$$

Use the area model then add the parts.

	100	40
10	$100 \times 10 = 1,000$	$40 \times 10 = 400$
2	$100 \times 2 = 200$	$40 \times 2 = 80$

	Th	H	T	O
	1	0	0	0
		4	0	0
		2	0	0
			8	0
			3	0
+				6
	1	7	1	6

$$143 \times 12 = 1,716$$

Use column multiplication, ensuring understanding of place value at each stage.

	Th	H	T	O
		1	4	3
x			1	2
		2	8	6
	1	4	3	0
	1	7	1	6

$$143 \times 2$$

$$143 \times 10$$

$$143 \times 12$$

Progress to include examples that require multiple exchanges as understanding, confidence and fluency build.

$$1,274 \times 32 = ?$$

First multiply 1,274 by 2.

	TTh	Th	H	T	O
		1	2	7	4
x				3	2
		2	5	4	8

$$1,274 \times 2$$

Then multiply 1,274 by 30.

	TTh	Th	H	T	O
		1	2	7	4
x				3	2
		2	5	4	8
	3	8	2	2	0

$$1,274 \times 2$$

$$1,274 \times 30$$

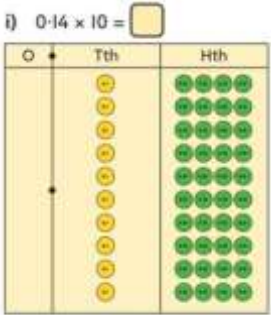
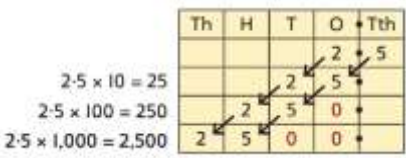
Finally add up the numbers.

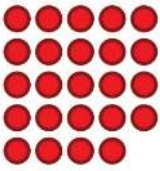
	TTh	Th	H	T	O
		1	2	7	4
x				3	2
		2	5	4	8
	3	8	2	2	0
	4	0	7	6	8

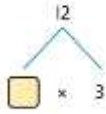
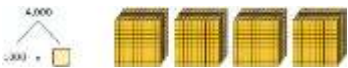
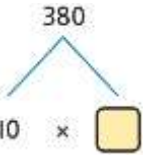
$$1,274 \times 2$$

$$1,274 \times 30$$

$$1,274 \times 32$$

Multiplying decimals by 10, 100 and 1,000	Use place value equipment to explore and understand the exchange of 10 tenths, 10 hundredths or 10 thousandths.	<p>Represent multiplication by 10 as exchange on a place value grid.</p>  $0.14 \times 10 = 1.4$	<p>Understand how this exchange is represented on a place value chart.</p> 

	Year 5 Division		
	Concrete	Pictorial	Abstract
Understanding factors and prime numbers	<p>Use equipment to explore the factors of a given number.</p>  <p>factors of a given number.</p> $24 \div 3 = 8$ $24 \div 8 = 3$ <p>8 and 3 are factors of 24 because they divide 24 exactly.</p> $24 \div 5 = 4 \text{ remainder } 4.$  <p>5 is not a factor of 24 because there is a remainder.</p>	<p>Understand that prime numbers are numbers with exactly two factors.</p> $13 \div 1 = 13$ $13 \div 2 = 6 \text{ r } 1$ $13 \div 4 = 4 \text{ r } 1$  <p>1 and 13 are the only factors of 13. 13 is a prime number.</p>	<p>Understand how to recognise prime and composite numbers.</p> <p><i>I know that 31 is a prime number because it can be divided by only 1 and itself without leaving a remainder.</i></p> <p><i>I know that 33 is not a prime number as it can be divided by 1, 3, 11 and 33.</i></p> <p><i>I know that 1 is not a prime number, as it has only 1 factor.</i></p>

<p>Understanding inverse operations and the link with multiplication, grouping and sharing</p>	<p>Use equipment to group and share and to explore the calculations that are present.</p> <p><i>I have 28 counters.</i></p> <p><i>I made 7 groups of 4. There are 28 in total.</i></p> <p><i>I have 28 in total. I shared them equally into 7 groups. There are 4 in each group.</i></p> <p><i>I have 28 in total. I made groups of 4. There are 7 equal groups.</i></p>	<p>Represent multiplicative relationships and explore the families of division facts.</p>  <p>$60 \div 4 = 15$ $60 \div 15 = 4$</p>	<p>Represent the different multiplicative relationships to solve problems requiring inverse operations.</p> <p>$12 \div 3 = \square$ $12 \div \square = 3$ $\square \times 3 = 12$ $\square \div 3 = 12$</p>  <p>Understand missing number problems for division calculations and know how to solve them using inverse operations.</p> <p>$22 \div ? = 2$ $22 \div 2 = ?$ $? \div 2 = 22$ $? \div 22 = 2$</p>								
<p>Dividing whole numbers by 10, 100 and 1,000</p>	<p>Use place value equipment to support unitising for division.</p> <p>$4,000 \div 1,000$</p>  <p>$4,000$ is 4 thousands.</p> <p>$4 \times 1,000 = 4,000$</p> <p>So, $4,000 \div 1,000 = 4$</p>	<p>Use a bar model to support dividing by unitising.</p> <p>$380 \div 10 = 38$</p>   <p>380 is 38 tens.</p> <p>$38 \times 10 = 380$ $10 \times 38 = 380$ So, $380 \div 10 = 38$</p>	<p>Understand how and why the digits change on a place value grid when dividing by 10, 100 or 1,000.</p> <table border="1" data-bbox="1123 1227 1374 1272"> <thead> <tr> <th>Th</th> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>2</td> <td>0</td> <td>0</td> </tr> </tbody> </table> <p>$3,200 \div 100 = ?$ $3,200$ is 3 thousands and 2 hundreds.</p> <p>$200 \div 100 = 2$ $3,000 \div 100 = 30$ $3,200 \div 100 = 32$</p> <p>So, the digits will move two places to the right.</p>	Th	H	T	O	3	2	0	0
Th	H	T	O								
3	2	0	0								

<div data-bbox="116 376 151 981" data-label="Page-Header"> <div>Dividing whole numbers by 10, 100 and 1,000</div> </div>	<div data-bbox="204 107 603 219" data-label="Text"> <p>Use place value equipment to represent known facts and unitising.</p> </div> <div data-bbox="204 264 608 360" data-label="Image"> </div> <div data-bbox="204 416 667 528" data-label="Text"> <p>15 ones put into groups of 3 ones. There are 5 groups. $15 \div 3 = 5$</p> </div> <div data-bbox="204 573 667 730" data-label="Text"> <p>15 tens put into groups of 3 tens. There are 5 groups. $150 \div 30 = 5$</p> </div>	<div data-bbox="694 107 1061 219" data-label="Text"> <p>Represent related facts with place value equipment when dividing by unitising.</p> </div> <div data-bbox="694 264 1066 483" data-label="Image"> </div> <div data-bbox="694 495 1066 707" data-label="Text"> <p>180 is 18 tens. 18 tens divided into groups of 3 tens. There are 6 groups. $180 \div 30 = 6$</p> </div> <div data-bbox="694 730 1098 887" data-label="Image"> </div> <div data-bbox="694 920 1098 1178" data-label="Text"> <p>12 ones divided into groups of 4. There are 3 groups. 12 hundreds divided into groups of 4 hundreds. There are 3 groups. $1200 \div 400 = 3$</p> </div>	<div data-bbox="1118 107 1481 297" data-label="Text"> <p>Reason from known facts, based on understanding of unitising. Use knowledge of the inverse relationship to check.</p> </div> <div data-bbox="1118 342 1337 622" data-label="Equation-Block"> $3,000 \div 5 = 600$ $3,000 \div 50 = 60$ $3,000 \div 500 = 6$ $5 \times 600 = 3,000$ $50 \times 60 = 3,000$ $500 \times 6 = 3,000$ </div>
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Explore grouping using place value equipment.

$$268 \div 2 = ?$$

There is 1 group of 2 hundreds.

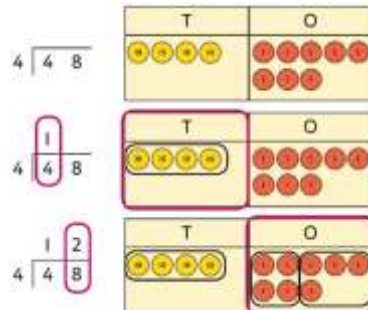
There are 3 groups of 2 tens.

There are 4 groups of 2 ones.

$$264 \div 2 = 134$$

Use place value equipment on a place value grid alongside short division.

The model uses grouping. A sharing model can also be used, although the model would need adapting.

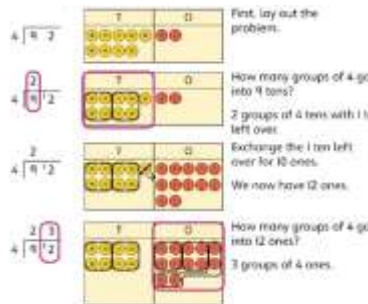


Lay out the problem as a short division.

There is 1 group of 4 in 4 tens.

There are 2 groups of 4 in 8 ones.

Work with divisions that require exchange.



Use short division for up to 4-digit numbers divided by a single digit.

		0	5	5	6	
	7	3	8	9	2	

$$3,892 \div 7 = 556$$

Use multiplication to check.

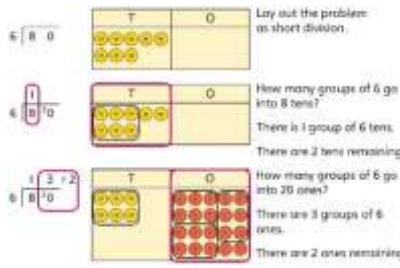
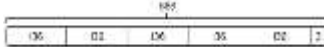
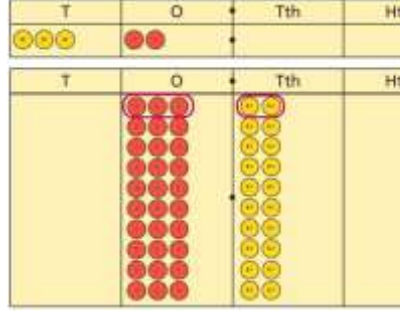
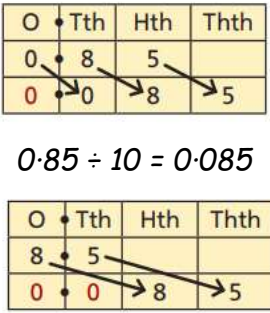
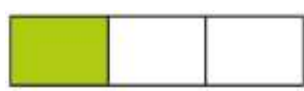
$$556 \times 7 = ?$$

$$6 \times 7 = 42$$

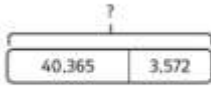
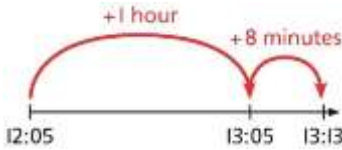
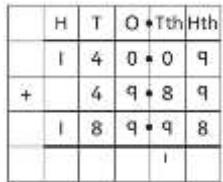
$$50 \times 7 = 350$$

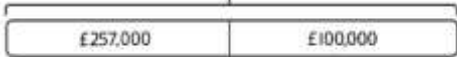
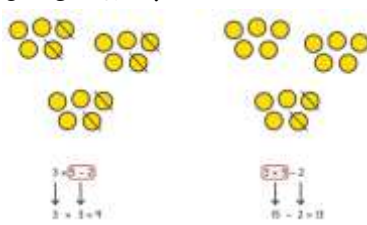
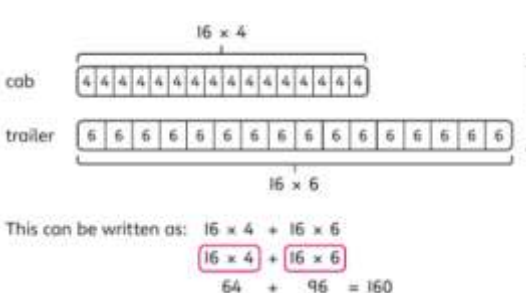
$$500 \times 7 = 3500$$

$$3,500 + 350 + 42 = 3,892$$

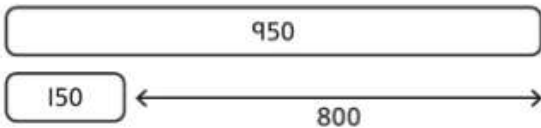
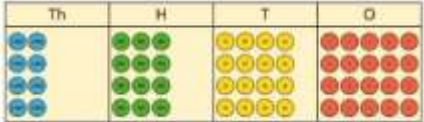
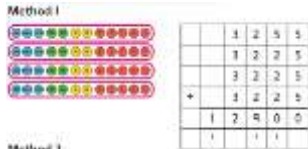
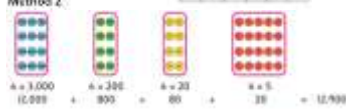
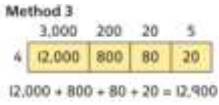
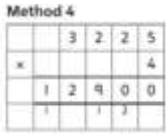
Understanding remainders	<p>Understand remainders using concrete versions of a problem.</p> <p>80 cakes divided into trays of 6.</p>  <p>80 cakes in total. They make 13 groups of 6, with 2 remaining.</p>	<p>Use short division and understand remainders as the last remaining 1s.</p>  <p>In problem solving contexts, represent divisions including remainders with a bar model.</p>  <p>$683 = 136 \times 5 + 3$ $683 \div 5 = 136 \text{ r } 3$</p>	
Dividing decimals by 10, 100 and 1,000	<p>Understand division by 10 using exchange.</p> <p>2 ones are 20 tenths.</p> <p>20 tenths divided by 10 is 2 tenths.</p>	<p>Represent division using exchange on a place value grid.</p>  <p>32 is 3 tens and 2 ones. This is equivalent to 30 ones and 20 tenths. 30 ones divided by 10 is 3 ones. 20 tenths divided by 10 is 2 tenths. 32 divided by 10 is 3.2.</p>	<p>Understand the movement of digits on a place value grid.</p>  <p>$0.85 \div 10 = 0.085$</p> <p>$8.5 \div 100 = 0.085$</p>
Understanding the relationship between fractions and division	<p>Use sharing to explore the link between fractions and division.</p> <p>1 whole shared between 3 people. Each person receives one-third.</p> 	<p>Use a bar model and other fraction representations to show the link between fractions and division.</p>  <p>$1 \div 3 = \frac{1}{3}$</p>	<p>Use the link between division and fractions to calculate divisions.</p> <p>$5 \div 4 = \frac{5}{4} = 1\frac{1}{4}$</p> <p>$11 \div 4 = \frac{11}{4} = 2\frac{3}{4}$</p>

Year 6 four operations

	Year 6 Addition		
	Concrete	Pictorial	Abstract
Comparing and selecting efficient methods	<p>Represent 7-digit numbers on a place value grid and use this to support thinking and mental methods.</p> 	<p>Discuss similarities and differences between methods, and choose efficient methods based on the specific calculation. Compare written and mental methods alongside place value representations.</p>   <p>Use bar model and number line representations to model addition in problem-solving and measure contexts.</p> 	<p>Use column addition where mental methods are not efficient. Recognise common errors with column addition.</p> <p>$17,877 + 4,012 = ?$</p>  <p>Which method has been completed accurately?</p> <p>What mistake has been made?</p> <p>Column methods are also used for decimal additions where mental methods are not efficient.</p> 

<p>Selecting mental methods for larger numbers where appropriate</p>	<p>Represent 7-digit numbers on a place value grid and use this to support thinking and mental methods.</p>  <p>$2,411,301 + 500,000 = ?$</p> <p><i>This would be 5 more counters in the HTh place.</i></p> <p><i>So, the total is 2,911,301.</i></p> <p>$2,411,301 + 500,000 = 2,911,301$</p>	<p>Use a bar model to support thinking in addition problems.</p> <p>$257,000 + 99,000 = ?$</p>  <p><i>I added 100 thousands then subtracted 1 thousand.</i></p> <p>$257 \text{ thousands} + 100 \text{ thousands} = 357 \text{ thousands}$</p> <p>$257,000 + 100,000 = 357,000$ $357,000 - 1,000 = 356,000$</p> <p><i>So, $257,000 + 99,000 = 356,000$</i></p>	<p>Use place value and unitising to support mental calculations with larger numbers.</p> <p>$195,000 + 6,000 = ?$</p> <p>$195 + 5 + 1 = 201$</p> <p><i>195 thousands + 6 thousands = 201 thousands</i></p> <p><i>So, $195,000 + 6,000 = 201,000$</i></p>
<p>Understanding order of operations in calculations</p>	<p>Use equipment to model different interpretations of a calculation with more than one operation. Explore different results.</p> <p>$3 \times 5 - 2 = ?$</p> 	<p>Model calculations using a bar model to demonstrate the correct order of operations in multi-step calculations.</p>  <p>This can be written as: $16 \times 4 + 16 \times 6$ $64 + 96 = 160$</p>	<p>Understand the correct order of operations in calculations without brackets.</p> <p>Understand how brackets affect the order of operations in a calculation.</p> <p>$4 + 6 \times 16$ $4 + 96 = 100$</p> <p>$(4 + 6) \times 16$ $10 \times 16 = 160$</p>

Year 6 Subtraction																																																			
	Concrete		Pictorial		Abstract																																														
Comparing and selecting efficient methods	Use counters on a place value grid to represent subtractions of larger numbers.		Compare subtraction methods alongside place value representations.		Compare and select methods. Use column subtraction when mental methods are not efficient. Use two different methods for one calculation as a checking strategy.																																														
	<table><tr><td>Th</td><td>H</td><td>T</td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr></table>		Th	H	T						<div>2,679</div> <table><tr><td colspan="2">?</td><td colspan="2">534</td></tr></table> <table><tr><td></td><td>Th</td><td>H</td><td>T</td><td>O</td></tr><tr><td></td><td>2</td><td>6</td><td>7</td><td>9</td></tr><tr><td>-</td><td></td><td>5</td><td>3</td><td>4</td></tr><tr><td></td><td>2</td><td>1</td><td>4</td><td>5</td></tr><tr><td></td><td></td><td></td><td></td><td></td></tr></table> <table><tr><td>Th</td><td>H</td><td>T</td><td>O</td></tr><tr><td></td><td></td><td></td><td></td></tr></table>		?		534			Th	H	T	O		2	6	7	9	-		5	3	4		2	1	4	5						Th	H	T	O					Use a bar model to represent calculations, including 'find the difference' with two bars as comparison.	Use column subtraction for decimal problems, including in the context of measure.
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	1	0	3	2	0																																														

Subtracting mentally with larger numbers		<p>Use a bar model to show how unitising can support mental calculations.</p> <p>$950,000 - 150,000$ That is 950 thousands - 150 thousands</p>  <p>So, the difference is 800 thousands. $950,000 - 150,000 = 800,000$</p>	<p>Subtract efficiently from powers of 10.</p> <p>$10,000 - 500 = ?$</p>
	Year 6 Multiplication		
	Concrete	Pictorial	Abstract
Multiplying up to a 4-digit number by a single digit number	<p>Use equipment to explore multiplications.</p>  <p>4 groups of 2,345</p> <p>This is a multiplication:</p> <p>$4 \times 2,345$ $2,345 \times 4$</p>	<p>Use place value equipment to compare methods.</p> <p>Method 1</p>  <p>Method 2</p> 	<p>Understand area model and short multiplication.</p> <p>Compare and select appropriate methods for specific multiplications.</p> <p>Method 3</p>  <p>Method 4</p> 

Multiplying up to a 4-digit number by a 2-digit number	<p>Use an area model alongside written multiplication.</p> <div><div><div>200305</div><div>204,000600100</div><div>1200305</div><div>4,200 + 630 + 105 = 4,935</div></div><div><table><tr><td></td><td></td><td></td><td>2</td><td>3</td><td>5</td><td></td></tr><tr><td></td><td>x</td><td></td><td></td><td>2</td><td>1</td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td>5</td><td>1 × 5</td></tr><tr><td></td><td></td><td></td><td></td><td>3</td><td>0</td><td>1 × 30</td></tr><tr><td></td><td></td><td></td><td>2</td><td>0</td><td>0</td><td>1 × 200</td></tr><tr><td></td><td></td><td></td><td>1</td><td>0</td><td>0</td><td>20 × 5</td></tr><tr><td></td><td></td><td></td><td>6</td><td>0</td><td>0</td><td>20 × 30</td></tr><tr><td></td><td></td><td>4</td><td>0</td><td>0</td><td>0</td><td>20 × 300</td></tr><tr><td></td><td></td><td>4</td><td>9</td><td>3</td><td>5</td><td>21 × 235</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table></div></div>				2	3	5			x			2	1							5	1 × 5					3	0	1 × 30				2	0	0	1 × 200				1	0	0	20 × 5				6	0	0	20 × 30			4	0	0	0	20 × 300			4	9	3	5	21 × 235								<p>Use compact column multiplication with understanding of place value at all stages.</p> <div><div>1 × 235</div><div>20 × 235</div><div>21 × 235</div></div> <div><table><tr><td></td><td></td><td></td><td>2</td><td>3</td><td>5</td></tr><tr><td></td><td>x</td><td></td><td></td><td>2</td><td>1</td></tr><tr><td></td><td></td><td></td><td>2</td><td>3</td><td>5</td></tr><tr><td></td><td></td><td>4</td><td>7</td><td>0</td><td>0</td></tr><tr><td></td><td></td><td>4</td><td>9</td><td>3</td><td>5</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></table></div>				2	3	5		x			2	1				2	3	5			4	7	0	0			4	9	3	5						
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		4	9	3	5																																																																																																							
Using knowledge of factors and partitions to compare methods for multiplications	<p>Use equipment to understand square numbers and cube numbers.</p> <div><div></div><div></div></div> <div><div>5 × 5 = 5² = 25</div><div>5 × 5 × 5 = 5³ = 25 × 5 = 125</div></div>	<p>Compare methods visually using an area model. Understand that multiple approaches will produce the same answer if completed accurately. Represent and compare methods using a bar model.</p> <div><div><div><div>5,000200</div><div>205,000 × 20200 × 20</div><div>55,000 × 5200 × 5</div></div><div><div>5,000200</div><div>205,000 × 20200 × 20</div><div>55,000 × 5200 × 5</div></div><div><div>5,000200</div><div>205,000 × 20200 × 20</div><div>55,000 × 5200 × 5</div></div><div><div>5,000200</div><div>205,000 × 20200 × 20</div><div>55,000 × 5200 × 5</div></div><div><div>5,000200</div><div>205,000 × 20200 × 20</div><div>55,000 × 5200 × 5</div></div><div><div>5,000200</div><div>205,000 × 20200 × 20</div><div>55,000 × 5200 × 5</div></div><div><div>5,000200</div><div>205,000 × 20200 × 20</div><div>55,000 × 5200 × 5</div></div><div><div>5,000200</div><div>205,000 × 20200 × 20</div><div>55,000 × 5200 × 5</div></div><div><div>5,000200</div><div>205,000 × 20200 × 20</div><div>55,000 × 5200 × 5</div></div><div><div>5,000200</div><div>205,000 × 20200 × 20</div><div>55,000 × 5200 × 5</div></div><div><div>5,000200</div><div>205,000 × 20200 × 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30 tenths are equivalent to 3 ones.

T	O	•	Tth
		•	

[illegible]

Multiply by 10.

The diagram shows a 3D array structure with three columns labeled T, O, and Tth. The O column contains 3 red circles, and the Tth column contains 10 yellow circles. Arrows indicate a mapping from the O column to the Tth column.

Exchange each group of ten-tenths.

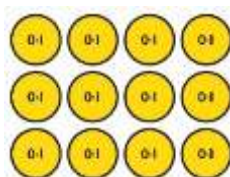
The diagram shows a 3D grid with three columns labeled T, O, and Tth. The O column contains three red circles. The Tth column contains ten yellow circles, arranged in two groups of five. Arrows point from the red circles in the O column to the yellow circles in the Tth column, indicating a mapping or transformation.

H	T	O	Tth	Hth
		0	3	
	0	3		

$$0.3 \times 10 = 3$$

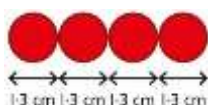
$$2.5 \times 20 = 2.5 \times 10 \times 2$$
$$= 50$$

Explore decimal multiplications using place value equipment and in the context of measures.



3 groups of 4 tenths is 12 tenths.

4 groups of 3 tenths is 12 tenths.



$$4 \times 1 \text{ cm} = 4 \text{ cm}$$

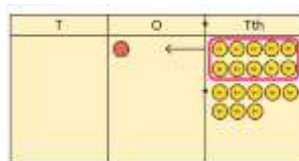
$$4 \times 0.3 \text{ cm} = 1.2 \text{ cm}$$

$$4 \times 1.3 = 4 + 1.2 = 5.2 \text{ cm}$$

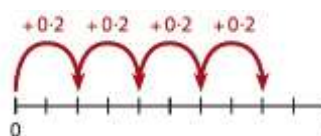
Represent calculations on a place value grid.

$$6 \times 3 = 18$$

$$6 \times 0.3 = 1.8$$



Understand the link between multiplying decimals and repeated addition.



Use known facts to multiply decimals.

$$4 \times 3 = 12$$

$$4 \times 0.3 = 1.2$$

$$4 \times 0.03 = 0.12$$

$$20 \times 5 = 100$$

$$20 \times 0.5 = 10$$

$$20 \times 0.05 = 1$$

Find families of facts from a known multiplication.

I know that $18 \times 4 = 72$.

This can help me work out:

$$1.8 \times 4 = ?$$

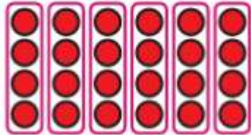
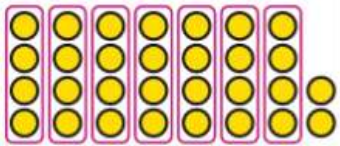
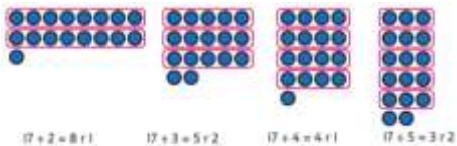
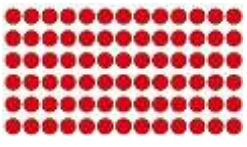
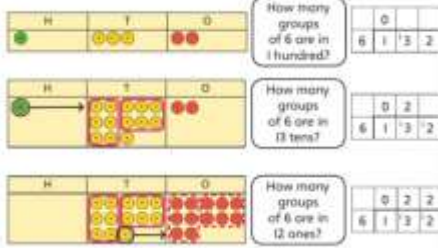
$$18 \times 0.4 = ?$$

$$180 \times 0.4 = ?$$

$$18 \times 0.04 = ?$$

Use a place value grid to understand the effects of multiplying decimals.

	H	T	O	Tth	Hth
2×3			6		
0.2×3			0	6	
0.02×3					6

Year 6 Division			
	Concrete	Pictorial	Abstract
Understanding factors	<p>Use equipment to explore different factors of a number.</p> <p>$24 \div 4 = 6$</p>  <p>$30 \div 4 = 7 \text{ remainder } 2$</p>  <p><i>4 is a factor of 24 but is not a factor of 30.</i></p>	<p>Recognise prime numbers as numbers having exactly two factors. Understand the link with division and remainders.</p>  <p>$17 \div 2 = 8 \text{ r } 1$ $17 \div 3 = 5 \text{ r } 2$ $17 \div 4 = 4 \text{ r } 1$ $17 \div 5 = 3 \text{ r } 2$</p>	<p>Recognise and know primes up to 100. Understand that 2 is the only even prime, and that 1 is not a prime number.</p> 
Dividing by a single digit	<p>Use equipment to make groups from a total.</p>  <p><i>There are 78 in total. There are 6 groups of 13. There are 13 groups of 6.</i></p>	 <p>How many groups of 6 are in 1 hundred? 6 1 3 2</p> <p>How many groups of 6 are in 13 tens? 6 1 3 2</p> <p>How many groups of 6 are in 12 ones? 6 1 3 2</p>	<p>Use short division to divide by a single digit.</p> $\begin{array}{r} 0 \\ 6 \overline{) 6132} \end{array}$ $\begin{array}{r} 0 \ 2 \\ 6 \overline{) 6132} \end{array}$ $\begin{array}{r} 0 \ 2 \ 2 \\ 6 \overline{) 6132} \end{array}$ <p>Use an area model to link multiplication and division.</p> 

<div>Dividing by a 2-digit number using factors</div>	<p>Understand that division by factors can be used when dividing by a number that is not prime.</p>	<p>Use factors and repeated division.</p> <p>$1,260 \div 14 = ?$</p> <div> <div>1,260</div> <div></div> <div></div> </div> <p>$1,260 \div 2 = 630$</p> <p>$630 \div 7 = 90$</p> <p>$1,260 \div 14 = 90$</p>	<p>Use factors and repeated division where appropriate.</p> <p>$2,100 \div 12 = ?$</p> <div> <div>2,100</div> <div>2,100</div> <div>2,100</div> <div>2,100</div> <div>2,100</div> </div>
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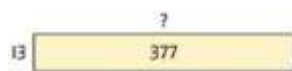
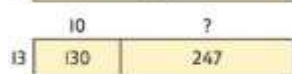
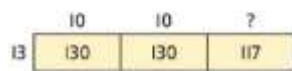
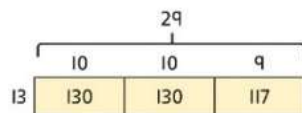
Use equipment to build numbers from groups.



182 divided into groups of 13.
There are 14 groups.

Use an area model alongside written division to model the process.

$$377 \div 13 = ?$$



$$377 \div 13 = 29$$

Use long division where factors are not useful (for example, when dividing by a 2-digit prime number). Write the required multiples to support the division process.

$$377 \div 13 = ?$$



		2	9
13	3	7	7
-	1	3	0
	2	4	7
-	1	3	0
	1	7	7
-	1	7	7
			0

$$377 \div 13 = 29$$

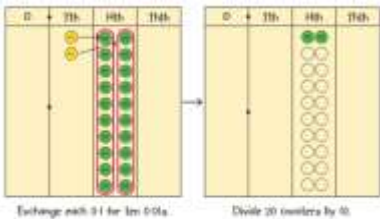
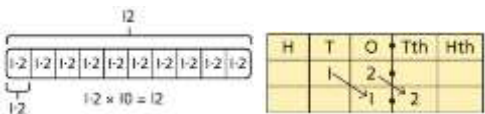
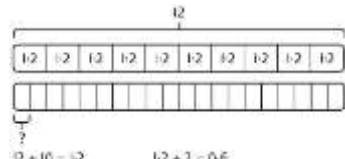
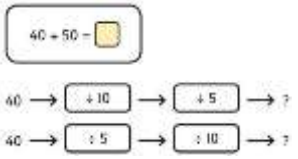
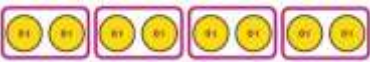
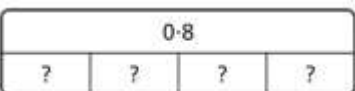
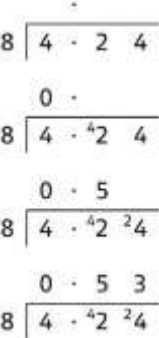
A slightly different layout may be used,

$$\begin{array}{r} 3 \\ 21 \overline{) 798} \\ - 630 \\ \hline 168 \end{array}$$

$$\begin{array}{r} 38 \\ 21 \overline{) 798} \\ - 630 \\ \hline 168 \\ - 168 \\ \hline 0 \end{array}$$

with the division completed above rather than at the side.

Divisions with a remainder explored in problem-solving contexts.

<div>Dividing by 10, 100 and 1,000</div>	<p>Use place value equipment to explore division as exchange.</p>  <p>Exchange each 10 for ten 0.01s. Divide 20 tenths by 10.</p> <p><i>0.2 is 2 tenths. 2 tenths is equivalent to 20 hundredths. 20 hundredths divided by 10 is 2 hundredths.</i></p>	<p>Represent division to show the relationship with multiplication. Understand the effect of dividing by 10, 100 and 1,000 on the digits on a place value grid.</p>  <p>Understand how to divide using division by 10, 100 and 1,000.</p> <p>$12 \div 20 = ?$</p>  <p>$12 \div 10 = 1.2$ $1.2 \div 2 = 0.6$</p>	<p>Use knowledge of factors to divide by multiples of 10, 100 and 1,000.</p>  <p>$40 \div 50 = 0.8$ $8 \div 10 = 0.8$</p> <p><i>So, $40 \div 50 = 0.8$</i></p>
<div>Dividing decimal</div>	<p>Use place value equipment to explore division of decimals.</p>  <p><i>8 tenths divided into 4 groups. 2 tenths in each group.</i></p>	<p>Use a bar model to represent divisions.</p>  <p>$4 \times 2 = 8$ $8 \div 4 = 2$ So, $4 \times 0.2 = 0.8$ $0.8 \div 4 = 0.2$</p>	<p>Use short division to divide decimals with up to 2 decimal places.</p>  <p>up to 2 decimal places.</p>