



St John's C of E Primary School, Danbury



Mathematics calculation policy, UPPER KS2 – Year 5

KEY STAGE 2

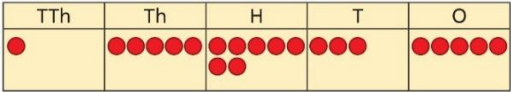
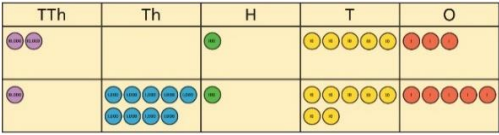
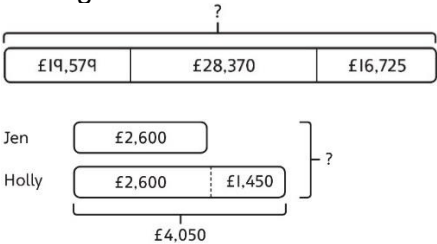
In upper Key Stage 2, children build on secure foundations in calculation, and develop fluency, accuracy and flexibility in their approach to the four operations. They work with whole numbers and adapt their skills to work with decimals, and they continue to develop their ability to select appropriate, accurate and efficient operations.


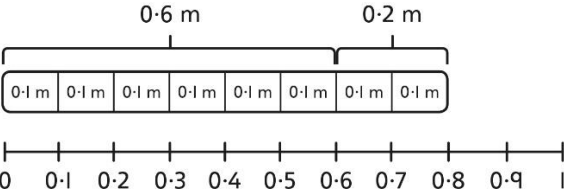
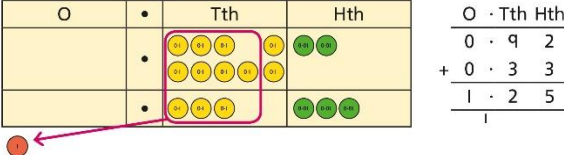
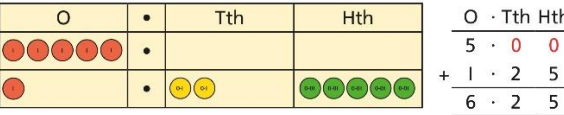
Key language: decimal, column methods, exchange, partition, mental method, ten thousand, hundred thousand, million, factor, multiple, prime number, square number, cube number

Addition and subtraction: Children build on their column methods to add and subtract numbers with up to seven digits, and they adapt the methods to calculate efficiently and effectively with decimals, ensuring understanding of place value at every stage.
Children compare and contrast methods, and they select mental methods or jottings where appropriate and where these are more likely to be efficient or accurate when compared with formal column methods.
Bar models are used to represent the calculations required to solve problems and may indicate where efficient methods can be chosen.


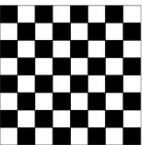
Multiplication and division: Building on their understanding, children develop methods to multiply up to 4-digit numbers by single-digit and 2-digit numbers.
Children develop column methods with an understanding of place value, and they continue to use the key skill of unitising to multiply and divide by 10, 100 and 1,000.
Written division methods are introduced and adapted for division by single-digit and 2-digit numbers and are understood alongside the area model and place value. In Year 6, children develop a secure understanding of how division is related to fractions.
Multiplication and division of decimals are also introduced and refined in Year 6.

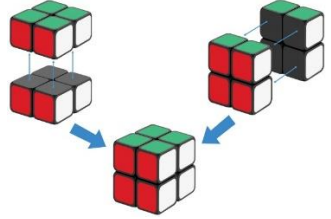
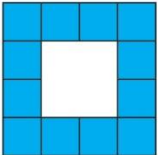
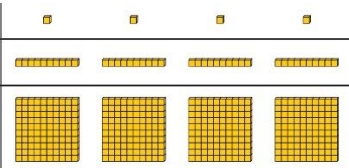
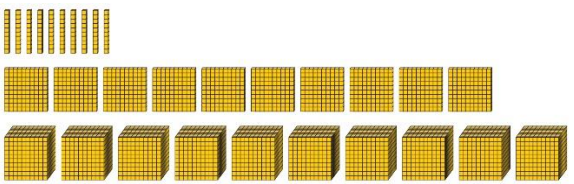
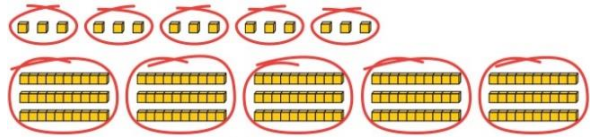
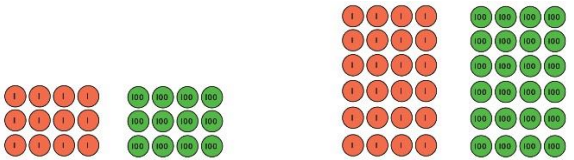
Fractions: Children find fractions of amounts, multiply a fraction by a whole number and by another fraction, divide a fraction by a whole number, and add and subtract fractions with different denominators. Children become more confident working with improper fractions and mixed numbers and can calculate with them.
Understanding of decimals with up to 3 decimal places is built through place value and as fractions, and children calculate with decimals in the context of measure as well as in pure arithmetic.
Children develop an understanding of percentages in relation to hundredths, and they understand how to work with common percentages: 50%, 25%, 10% and 1%.

Year 5			
	Concrete	Pictorial	Abstract
Year 5 Addition			
Column addition with whole numbers	<p>Use place value equipment to represent additions.</p> <p>Add a row of counters onto the place value grid to show $15,735 + 4,012$.</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> $\begin{array}{r} \text{TTh} \text{ Th} \text{ H} \text{ T} \text{ O} \\ 2 \ 0 \ 1 \ 5 \ 3 \\ + 1 \ 9 \ 1 \ 7 \ 5 \\ \hline 3 \ 9 \ 3 \ 2 \ 8 \end{array}$	<p>Use column addition, including exchanges.</p> $\begin{array}{r} \text{TTh} \text{ Th} \text{ H} \text{ T} \text{ O} \\ 1 \ 9 \ 1 \ 7 \ 5 \\ + 1 \ 8 \ 4 \ 1 \ 7 \\ \hline 3 \ 7 \ 5 \ 9 \ 2 \end{array}$
Representing additions		<p>Bar models represent addition of two or more numbers in the context of problem solving.</p>  $\begin{array}{r} \text{Th} \text{ H} \text{ T} \text{ O} \\ 2 \ 6 \ 0 \ 0 \\ + 1 \ 4 \ 5 \ 0 \\ \hline 4 \ 0 \ 5 \ 0 \end{array} \qquad \begin{array}{r} \text{Th} \text{ H} \text{ T} \text{ O} \\ 2 \ 6 \ 0 \ 0 \\ + 4 \ 0 \ 5 \ 0 \\ \hline 6 \ 6 \ 5 \ 0 \end{array}$	<p>Use approximation to check whether answers are reasonable.</p> $\begin{array}{r} \text{TTh} \text{ Th} \text{ H} \text{ T} \text{ O} \\ 2 \ 3 \ 4 \ 0 \ 5 \\ + \quad 7 \ 8 \ 9 \ 2 \\ \hline 2 \ 0 \ 2 \ 9 \ 7 \end{array} \qquad \begin{array}{r} \text{TTh} \text{ Th} \text{ H} \text{ T} \text{ O} \\ 2 \ 3 \ 4 \ 0 \ 5 \\ + \quad 7 \ 8 \ 9 \ 2 \\ \hline 3 \ 1 \ 2 \ 9 \ 7 \end{array}$ <p><i>I will use $23,000 + 8,000$ to check.</i></p>
Adding tenths	<p>Link measure with addition of decimals.</p> <p>Two lengths of fencing are 0.6 m and</p>	<p>Use a bar model with a number line to add tenths.</p>	<p>Understand the link with adding fractions.</p>

	<p>0.2 m. How long are they when added together?</p> 	 <p>$0.6 + 0.2 = 0.8$ 6 tenths + 2 tenths = 8 tenths</p>	$\frac{6}{10} + \frac{2}{10} = \frac{8}{10}$ <p>6 tenths + 2 tenths = 8 tenths $0.6 + 0.2 = 0.8$</p>
<p>Adding decimals using column addition</p>	<p>Use place value equipment to represent additions. Show $0.23 + 0.45$ using place value counters.</p>	<p>Use place value equipment on a place value grid to represent additions. Represent exchange where necessary.</p>  <p>Include examples where the numbers of decimal places are different.</p> 	<p>Add using a column method, ensuring that children understand the link with place value.</p> $\begin{array}{r} 0.23 \\ + 0.45 \\ \hline 0.68 \end{array}$ <p>Include exchange where required, alongside an understanding of place value.</p> $\begin{array}{r} 0.92 \\ + 0.33 \\ \hline 1.25 \end{array}$ <p>Include additions where the numbers of decimal places are different.</p> <p>$3.4 + 0.65 = ?$</p> $\begin{array}{r} 3.40 \\ + 0.65 \\ \hline \end{array}$
<p>Year 5 Subtraction</p>			
<p>Column subtraction with whole numbers</p>	<p>Use place value equipment to understand where exchanges are required. $2,250 - 1,070$</p>	<p>Represent the stages of the calculation using place value equipment on a grid alongside the calculation, including exchanges where required.</p>	<p>Use column subtraction methods with exchange where required.</p>

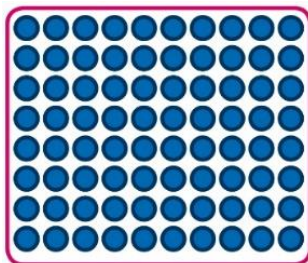
		<p>$15,735 - 2,582 = 13,153$</p> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>TTh</th> <th>Th</th> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td>●</td> <td>●●●●●</td> <td>●●●●●</td> <td>●●●●●</td> <td>●●●●●</td> </tr> <tr> <td></td> <td>●●●●●</td> <td>●●●●●</td> <td>●●●●●</td> <td>●●●●●</td> </tr> <tr> <td></td> <td></td> <td>●●</td> <td>●●●●●</td> <td>●●●●●</td> </tr> </tbody> </table> <p>Now subtract the 10s. Exchange 1 hundred for 10 tens.</p> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>TTh</th> <th>Th</th> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td>●</td> <td>●●●●●</td> <td>●●●●●</td> <td>●●●●●</td> <td>●●●●●</td> </tr> <tr> <td></td> <td>●●●●●</td> <td>●●</td> <td>●●●●●</td> <td>●●●●●</td> </tr> <tr> <td></td> <td></td> <td></td> <td>●●●●●</td> <td>●●●●●</td> </tr> </tbody> </table> <p>Subtract the 100s, 1,000s and 10,000s.</p> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>TTh</th> <th>Th</th> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td>●</td> <td>●●●●●</td> <td>●●</td> <td>●●●●●</td> <td>●●●●●</td> </tr> <tr> <td></td> <td>●●●●●</td> <td>●●</td> <td>●●●●●</td> <td>●●●●●</td> </tr> <tr> <td></td> <td></td> <td></td> <td>●●●●●</td> <td>●●●●●</td> </tr> </tbody> </table>	TTh	Th	H	T	O	●	●●●●●	●●●●●	●●●●●	●●●●●		●●●●●	●●●●●	●●●●●	●●●●●			●●	●●●●●	●●●●●	TTh	Th	H	T	O	●	●●●●●	●●●●●	●●●●●	●●●●●		●●●●●	●●	●●●●●	●●●●●				●●●●●	●●●●●	TTh	Th	H	T	O	●	●●●●●	●●	●●●●●	●●●●●		●●●●●	●●	●●●●●	●●●●●				●●●●●	●●●●●	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>TTh</th> <th>Th</th> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td>5</td> <td>12</td> <td>10</td> <td>9</td> <td>7</td> </tr> <tr> <td>-</td> <td>1</td> <td>8</td> <td>5</td> <td>3</td> </tr> <tr> <td colspan="5"><hr/></td> </tr> <tr> <td>4</td> <td>3</td> <td>5</td> <td>6</td> <td>3</td> </tr> </tbody> </table> <p>$62,097 - 18,534 = 43,563$</p>	TTh	Th	H	T	O	5	12	10	9	7	-	1	8	5	3	<hr/>					4	3	5	6	3
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<p>Checking strategies and representing subtractions</p>		<p>Bar models represent subtractions in problem contexts, including 'find the difference'.</p> <p>Athletics Stadium 75,450</p> <p>Hockey Centre ← 42,300 →</p> <p>Velodrome 15,735 ← ? →</p>	<p>Children can explain the mistake made when the columns have not been ordered correctly.</p> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th colspan="5">Bella's working</th> <th colspan="5">Correct method</th> </tr> <tr> <th>TTh</th> <th>Th</th> <th>H</th> <th>T</th> <th>O</th> <th>TTh</th> <th>Th</th> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>7</td> <td>8</td> <td>7</td> <td>7</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> <td>4</td> <td>0</td> <td>1</td> <td>2</td> </tr> <tr> <td colspan="5"><hr/></td> <td colspan="5"><hr/></td> </tr> <tr> <td>5</td> <td>7</td> <td>9</td> <td>9</td> <td>7</td> <td>2</td> <td>1</td> <td>8</td> <td>8</td> <td>9</td> </tr> </tbody> </table> <p>Use approximation to check calculations.</p> <p><i>I calculated 18,000 + 4,000 mentally to check my subtraction.</i></p>	Bella's working					Correct method					TTh	Th	H	T	O	TTh	Th	H	T	O	1	7	8	7	7	1	7	8	7	7	+	4	0	1	2	+	4	0	1	2	<hr/>					<hr/>					5	7	9	9	7	2	1	8	8	9																									
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<p>Choosing efficient methods</p>			<p>To subtract two large numbers that are close, children find the difference by counting on.</p> <p>$2,002 - 1,995 = ?$</p> <p>Use addition to check subtractions.</p>																																																																																					

			<p><i>I calculated $7,546 - 2,355 = 5,191$. I will check using the inverse.</i></p>																																																
<p>Subtracting decimals</p>	<p>Explore complements to a whole number by working in the context of length.</p>  <p>1 m - <input type="text"/> m = <input type="text"/> m</p> <p>$1 - 0.49 = ?$</p>	<p>Use a place value grid to represent the stages of column subtraction, including exchanges where required.</p> <p>$5.74 - 2.25 = ?$</p> <table border="1" data-bbox="943 411 1361 507"> <tr> <th>O</th> <th>Tth</th> <th>Hth</th> </tr> <tr> <td>● ● ● ● ●</td> <td>● ● ● ● ● ● ● ●</td> <td>● ● ● ● ● ● ● ●</td> </tr> </table> <p>Exchange 1 tenth for 10 hundredths.</p> <table border="1" data-bbox="943 547 1361 667"> <tr> <th>O</th> <th>Tth</th> <th>Hth</th> </tr> <tr> <td>● ● ● ● ●</td> <td>● ● ● ● ● ● ● ● ● ●</td> <td>● ● ● ● ● ● ● ●</td> </tr> </table> <p>Now subtract the 5 hundredths.</p> <table border="1" data-bbox="943 707 1361 826"> <tr> <th>O</th> <th>Tth</th> <th>Hth</th> </tr> <tr> <td>● ● ● ● ●</td> <td>● ● ● ● ● ● ● ● ● ●</td> <td>● ● ● ● ● ● ● ● ● ●</td> </tr> </table> <p>Now subtract the 2 tenths, then the 2 ones.</p> <table border="1" data-bbox="943 866 1361 986"> <tr> <th>O</th> <th>Tth</th> <th>Hth</th> </tr> <tr> <td>● ● ● ● ●</td> <td>● ● ● ● ● ● ● ● ● ●</td> <td>● ● ● ● ● ● ● ● ● ●</td> </tr> </table>	O	Tth	Hth	● ● ● ● ●	● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ●	O	Tth	Hth	● ● ● ● ●	● ● ● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ●	O	Tth	Hth	● ● ● ● ●	● ● ● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ● ● ●	O	Tth	Hth	● ● ● ● ●	● ● ● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ● ● ●	<p>Use column subtraction, with an understanding of place value, including subtracting numbers with different numbers of decimal places.</p> <p>$3.921 - 3.75 = ?$</p> <table border="1" data-bbox="1556 443 1803 587"> <tr> <th>O</th> <th>Tth</th> <th>Hth</th> <th>Thth</th> </tr> <tr> <td>3</td> <td>9</td> <td>2</td> <td>1</td> </tr> <tr> <td colspan="4"><hr/></td> </tr> <tr> <td>3</td> <td>7</td> <td>5</td> <td>0</td> </tr> <tr> <td colspan="4"><hr/></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </table>	O	Tth	Hth	Thth	3	9	2	1	<hr/>				3	7	5	0	<hr/>							
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<p>Year 5 Multiplication</p>																																																			
<p>Understanding factors</p>	<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>Use images to explore examples and non-examples of square numbers.</p>  <p>$8 \times 8 = 64$ $8^2 = 64$</p>	<p>Understand the pattern of square numbers in the multiplication tables.</p> <p>Use a multiplication grid to circle each square number. Can children spot a pattern?</p>																																																

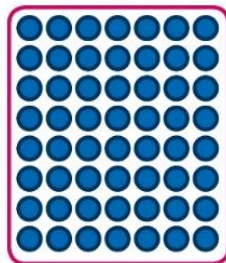
	 <p><i>8 is a cube number.</i></p>	 <p><i>12 is not a square number, because you cannot multiply a whole number by itself to make 12.</i></p>							
<p>Multiplying by 10, 100 and 1,000</p>	<p>Use place value equipment to multiply by 10, 100 and 1,000 by unitising.</p> <p>$4 \times 1 = 4 \text{ ones} = 4$</p> <p>$4 \times 10 = 4 \text{ tens} = 40$</p> <p>$4 \times 100 = 4 \text{ hundreds} = 400$</p> 	<p>Understand the effect of repeated multiplication by 10.</p> 	<p>Understand how exchange relates to the digits when multiplying by 10, 100 and 1,000.</p> <table border="1" data-bbox="1541 571 1915 705"> <thead> <tr> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td></td> <td>1</td> <td>7</td> </tr> </tbody> </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		1	7
H	T	O							
	1	7							
<p>Multiplying by multiples of 10, 100 and 1,000</p>	<p>Use place value equipment to explore multiplying by unitising.</p>  <p><i>5 groups of 3 ones is 15 ones. 5 groups of 3 tens is 15 tens.</i></p> <p><i>So, I know that 5 groups of 3 thousands would be 15 thousands.</i></p>	<p>Use place value equipment to represent how to multiply by multiples of 10, 100 and 1,000.</p>  <p>$4 \times 3 = 12$ $6 \times 4 = 24$ $4 \times 30 = 1,200$ $6 \times 400 = 2,400$</p>	<p>Use known facts and unitising to multiply.</p> <p>$5 \times 4 = 20$ $5 \times 40 = 200$ $5 \times 400 = 2,000$ $5 \times 4,000 = 20,000$</p> <p>$5,000 \times 4 = 20,000$</p>						
<p>Multiplying up to 4-digit</p>	<p>Explore how to use partitioning to multiply efficiently.</p>	<p>Represent multiplications using place value equipment and add the 1s, then 10s, then</p>	<p>Use an area model and then add the parts.</p>						

numbers by a single digit

$8 \times 17 = ?$



$8 \times 10 = 80$



$8 \times 7 = 56$

$80 + 56 = 136$

So, $8 \times 17 = 136$

100s, then 1,000s.

H	T	O
100	10 10 10 10 10 10	1 1 1
100	10 10 10 10 10 10	1 1 1
100	10 10 10 10 10 10	1 1 1
100	10 10 10 10 10 10	1 1 1
100	10 10 10 10 10 10	1 1 1

100	60	3
5 $100 \times 5 = 500$	$60 \times 5 = 300$	$3 \times 5 = 15$

Use a column multiplication, including any required exchanges.

$$\begin{array}{r} 136 \\ \times 6 \\ \hline 816 \\ \underline{23} \end{array}$$

Multiplying 2-digit numbers by 2-digit numbers

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

$23 \times 15 = ?$



$10 \times 15 = 150$



$10 \times 15 = 150$



$3 \times 15 = 45$

There are 345 bottles of milk in total.

$$\begin{array}{r} \text{H T O} \\ 150 \\ 150 \\ + 45 \\ \hline 345 \end{array}$$

$23 \times 15 = 345$

Use an area model and add the parts.

$28 \times 15 = ?$

	20 m	8 m	
10 m	$20 \times 10 = 200 \text{ m}^2$	$8 \times 10 = 80 \text{ m}^2$	$\begin{array}{r} \text{H T O} \\ 200 \\ 100 \\ + 80 \\ \hline 420 \end{array}$
5 m	$20 \times 5 = 100 \text{ m}^2$	$8 \times 5 = 40 \text{ m}^2$	

$28 \times 15 = 420$

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

$$\begin{array}{r} 34 \\ \times 27 \\ \hline 238 \quad 34 \times 7 \\ \hline 680 \quad 34 \times 20 \\ \hline 918 \quad 34 \times 27 \end{array}$$

$$\begin{array}{r} 34 \\ \times 27 \\ \hline 238 \quad 34 \times 7 \\ 680 \quad 34 \times 20 \\ \hline 918 \quad 34 \times 27 \end{array}$$

Multiplying up to 4-digits by 2-digits

Use the area model then add the parts.

	100	40	3
10			
2			

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

$143 \times 12 = 1,716$

There are 1,716 boxes of cereal in total.

$143 \times 12 = 1,716$

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

	1 4 3	
×	1 2	
	2 8 6	143×2
	1 4 3 0	143×10
	1 7 1 6	143×12

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

$1,274 \times 32 = ?$
 First multiply 1,274 by 2.

	1 2 7 4	
×	3 2	
	2 5 4 8	$1,274 \times 2$

Then multiply 1,274 by 30.

	1 2 7 4	
×	3 2	
	2 5 4 8	$1,274 \times 2$
	3 8 2 2 0	$1,274 \times 30$

Finally, find the total.

	1 2 7 4	
×	3 2	
	2 5 4 8	$1,274 \times 2$
	3 8 2 2 0	$1,274 \times 30$
	4 0 7 6 8	$1,274 \times 32$
	1 2 7 4	
	1 2 7 4	

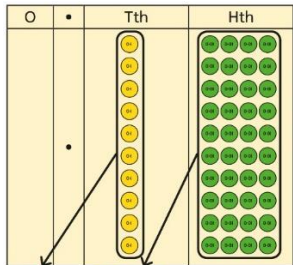
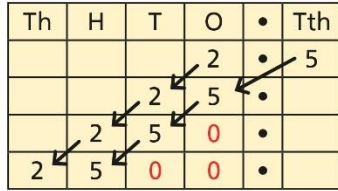

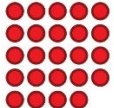
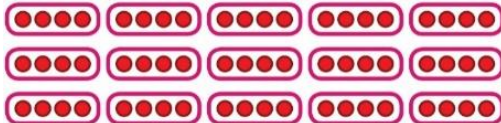
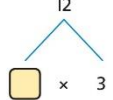
$1,274 \times 32 = 40,768$

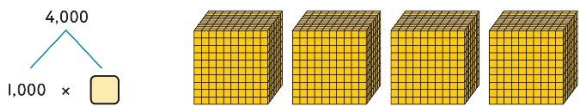
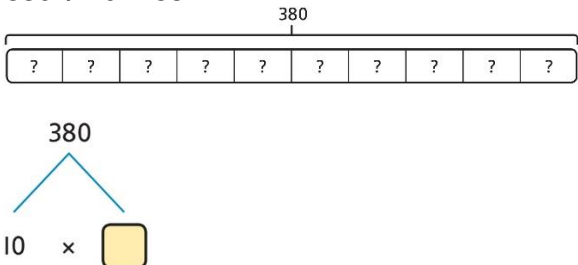
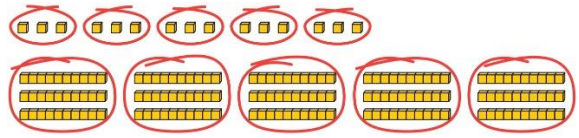
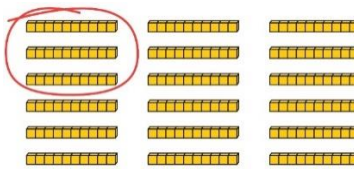
Multiplying

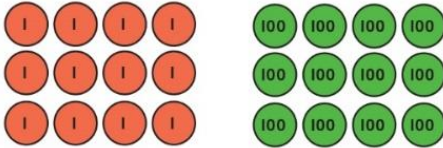
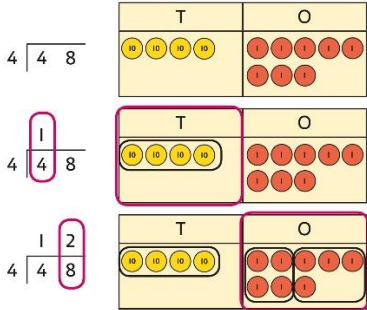
Use place value equipment to explore and


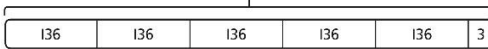
Represent multiplication by 10 as exchange

Understand how this exchange is

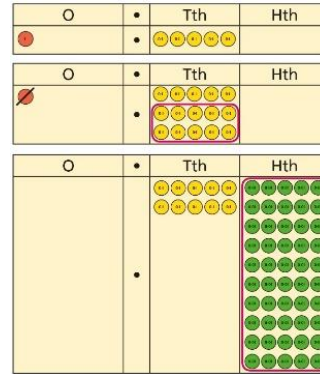
<p>decimals by 10, 100 and 1,000</p>	<p>understand the exchange of 10 tenths, 10 hundredths or 10 thousandths.</p>	<p>on a place value grid.</p>  <p>$0.14 \times 10 = 1.4$</p>	<p>represented on a place value chart.</p>  <p>$2.5 \times 10 = 25$ $2.5 \times 100 = 250$ $2.5 \times 1,000 = 2,500$</p>
<p>Year 5 Division</p>			
<p>Understanding factors and prime numbers</p>	<p>Use equipment to explore the factors of a given number.</p>  <p>$24 \div 3 = 8$ $24 \div 8 = 3$ <i>8 and 3 are factors of 24 because they divide 24 exactly.</i></p> <p>$24 \div 5 = 4$ remainder 4.</p>  <p><i>5 is not a factor of 24 because there is a remainder.</i></p>	<p>Understand that prime numbers are numbers with exactly two factors.</p> <p>$13 \div 1 = 13$ $13 \div 2 = 6 \text{ r } 1$ $13 \div 4 = 4 \text{ r } 1$</p> <p><i>1 and 13 are the only factors of 13. 13 is a prime number.</i></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</i></p>	<p>Represent multiplicative relationships and explore the families of division facts.</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>7 groups. There are 4 in each group.</p> <p>I have 28 in total. I made groups of 4. There are 7 equal groups.</p>	$60 \div 4 = 15$ $60 \div 15 = 4$	<p>Understand missing number problems for division calculations and know how to solve them using inverse operations.</p> $22 \div ? = 2$ $22 \div 2 = ?$ $? \div 2 = 22$ $? \div 22 = 2$								
<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>$38 \times 10 = 380$</p> <p>$10 \times 38 = 380$</p> <p>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="1541 545 1966 630"> <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>$3,200 \div 100 = ?$</p> <p>3,200 is 3 thousands and 2 hundreds.</p> <p>$200 \div 100 = 2$</p> <p>$3,000 \div 100 = 30$</p> <p>$3,200 \div 100 = 32$</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								
<p>Dividing by multiples of 10, 100 and 1,000</p>	<p>Use place value equipment to represent known facts and unitising.</p>  <p>15 ones put into groups of 3 ones. There are 5 groups.</p> <p>$15 \div 3 = 5$</p> <p>15 tens put into groups of 3 tens. There are 5 groups.</p>	<p>Represent related facts with place value equipment when dividing by unitising.</p>  <p>180 is 18 tens.</p> <p>18 tens divided into groups of 3 tens. There are 6 groups.</p>	<p>Reason from known facts, based on understanding of unitising. Use knowledge of the inverse relationship to check.</p> <p>$3,000 \div 5 = 600$</p> <p>$3,000 \div 50 = 60$</p> <p>$3,000 \div 500 = 6$</p> <p>$5 \times 600 = 3,000$</p> <p>$50 \times 60 = 3,000$</p> <p>$500 \times 6 = 3,000$</p>								

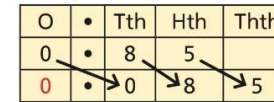
	<p>$150 \div 30 = 5$</p>	<p>$180 \div 30 = 6$</p>  <p><i>12 ones divided into groups of 4. There are 3 groups.</i></p> <p><i>12 hundreds divided into groups of 4 hundreds. There are 3 groups.</i></p> <p>$1200 \div 400 = 3$</p>	
<p>Dividing up to four digits by a single digit using short division</p>	<p>Explore grouping using place value equipment.</p> <p>$268 \div 2 = ?$</p> <p><i>There is 1 group of 2 hundreds.</i> <i>There are 3 groups of 2 tens.</i> <i>There are 4 groups of 2 ones.</i></p> <p>$264 \div 2 = 134$</p>	<p>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.</p>  <p>Lay out the problem as a short division.</p> <p><i>There is 1 group of 4 in 4 tens.</i> <i>There are 2 groups of 4 in 8 ones.</i></p> <p>Work with divisions that require exchange.</p>	<p>Use short division for up to 4-digit numbers divided by a single digit.</p> $\begin{array}{r} 0 \ 5 \ 5 \ 6 \\ 7 \overline{) 3 \ 38 \ 39 \ 42} \end{array}$ <p>$3,892 \div 7 = 556$</p> <p>Use multiplication to check.</p> <p>$556 \times 7 = ?$</p> <p>$6 \times 7 = 42$ $50 \times 7 = 350$ $500 \times 7 = 3500$</p> <p>$3,500 + 350 + 42 = 3,892$</p>

		<div style="display: flex; flex-direction: column; align-items: flex-start;"> <div style="display: flex; align-items: flex-start; margin-bottom: 10px;"> <div style="margin-right: 10px;">$4 \overline{) 92}$</div> <div style="border: 1px solid black; padding: 5px;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>T</td><td>O</td></tr> <tr><td>10 10 10 10 10</td><td>2 2</td></tr> </table> </div> <div style="margin-left: 10px; font-size: small;">First, lay out the problem.</div> </div> <div style="display: flex; align-items: flex-start; margin-bottom: 10px;"> <div style="margin-right: 10px;">$4 \overline{) 9} 2$</div> <div style="border: 1px solid black; padding: 5px;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>T</td><td>O</td></tr> <tr><td>10 10 10 10 10</td><td>2 2</td></tr> </table> </div> <div style="margin-left: 10px; font-size: small;">How many groups of 4 go into 9 tens? 2 groups of 4 tens with 1 ten left over.</div> </div> <div style="display: flex; align-items: flex-start; margin-bottom: 10px;"> <div style="margin-right: 10px;">$4 \overline{) 9} 2$</div> <div style="border: 1px solid black; padding: 5px;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>T</td><td>O</td></tr> <tr><td>10 10 10 10 10</td><td>2 2 2 2 2 2 2 2 2 2</td></tr> </table> </div> <div style="margin-left: 10px; font-size: small;">Exchange the 1 ten left over for 10 ones. We now have 12 ones.</div> </div> <div style="display: flex; align-items: flex-start;"> <div style="margin-right: 10px;">$4 \overline{) 9} 2$</div> <div style="border: 1px solid black; padding: 5px;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>T</td><td>O</td></tr> <tr><td>10 10 10</td><td>2 2 2 2 2 2 2 2 2 2 2 2</td></tr> </table> </div> <div style="margin-left: 10px; font-size: small;">How many groups of 4 go into 12 ones? 3 groups of 4 ones.</div> </div> </div>	T	O	10 10 10 10 10	2 2	T	O	10 10 10 10 10	2 2	T	O	10 10 10 10 10	2 2 2 2 2 2 2 2 2 2	T	O	10 10 10	2 2 2 2 2 2 2 2 2 2 2 2	
T	O																		
10 10 10 10 10	2 2																		
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10 10 10 10 10	2 2																		
T	O																		
10 10 10 10 10	2 2 2 2 2 2 2 2 2 2																		
T	O																		
10 10 10	2 2 2 2 2 2 2 2 2 2 2 2																		
<p>Understanding remainders</p> <p>Understand remainders using concrete versions of a problem.</p> <p><i>80 cakes divided into trays of 6.</i></p>  <p><i>80 cakes in total. They make 13 groups of 6, with 2 remaining.</i></p>		<p>Use short division and understand remainders as the last remaining 1s.</p> <div style="display: flex; flex-direction: column; align-items: flex-start;"> <div style="display: flex; align-items: flex-start; margin-bottom: 10px;"> <div style="margin-right: 10px;">$6 \overline{) 80}$</div> <div style="border: 1px solid black; padding: 5px;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>T</td><td>O</td></tr> <tr><td>10 10 10</td><td></td></tr> </table> </div> <div style="margin-left: 10px; font-size: small;">Lay out the problem as short division.</div> </div> <div style="display: flex; align-items: flex-start; margin-bottom: 10px;"> <div style="margin-right: 10px;">$6 \overline{) 8} 0$</div> <div style="border: 1px solid black; padding: 5px;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>T</td><td>O</td></tr> <tr><td>10 10 10 10</td><td></td></tr> </table> </div> <div style="margin-left: 10px; font-size: small;">How many groups of 6 go into 8 tens? There is 1 group of 6 tens. There are 2 tens remaining.</div> </div> <div style="display: flex; align-items: flex-start;"> <div style="margin-right: 10px;">$6 \overline{) 8} 0$</div> <div style="border: 1px solid black; padding: 5px;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>T</td><td>O</td></tr> <tr><td>10 10 10</td><td>2 2 2 2 2 2 2 2 2 2 2 2</td></tr> </table> </div> <div style="margin-left: 10px; font-size: small;">How many groups of 6 go into 20 ones? There are 3 groups of 6 ones. There are 2 ones remaining.</div> </div> </div>	T	O	10 10 10		T	O	10 10 10 10		T	O	10 10 10	2 2 2 2 2 2 2 2 2 2 2 2	<p>In problem solving contexts, represent divisions including remainders with a bar model.</p> <div style="text-align: center; margin-bottom: 10px;"> 683  </div> <p>$683 = 136 \times 5 + 3$ $683 \div 5 = 136 \text{ r } 3$</p>				
T	O																		
10 10 10																			
T	O																		
10 10 10 10																			
T	O																		
10 10 10	2 2 2 2 2 2 2 2 2 2 2 2																		
<p>Dividing decimals by 10, 100 and 1,000</p>	<p>Understand division by 10 using exchange.</p> <p><i>2 ones are 20 tenths.</i></p>	<p>Represent division using exchange on a place value grid.</p>	<p>Understand the movement of digits on a place value grid.</p>																

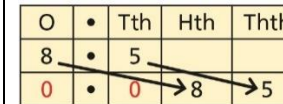
20 tenths divided by 10 is 2 tenths.



1.5 is 1 one and 5 tenths.
 This is equivalent to 10 tenths and 50 hundredths.
 10 tenths divided by 10 is 1 tenth.
 50 hundredths divided by 10 is 5 hundredths.
 1.5 divided by 10 is 1 tenth and 5 hundredths.
 $1.5 \div 10 = 0.15$



$$0.85 \div 10 = 0.085$$



$$8.5 \div 100 = 0.085$$

Understanding the relationship between fractions and division

Use sharing to explore the link between fractions and division.

1 whole shared between 3 people.
 Each person receives one-third.



Use a bar model and other fraction representations to show the link between fractions and division.



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

Use the link between division and fractions to calculate divisions.

$$5 \div 4 = \frac{5}{4} = 1\frac{1}{4}$$

$$11 \div 4 = \frac{11}{4} = 2\frac{3}{4}$$