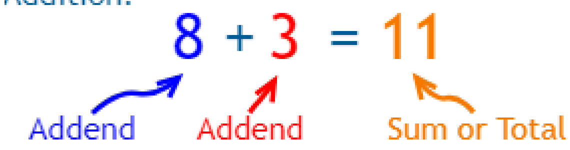
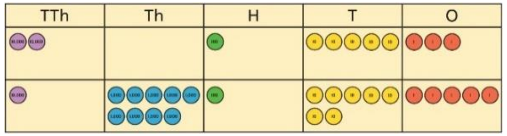
Brooke Weston Trust **calculation policy, Upper KS2**

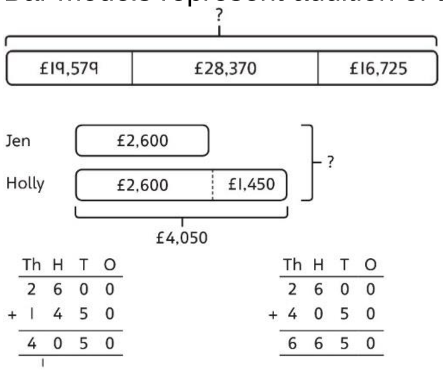
The following pages show the *Power Maths* progression in calculation (addition, subtraction, multiplication and division) and how this works in line with the National Curriculum. The consistent use of the CPA (concrete, pictorial, abstract) approach across *Power Maths* helps children develop mastery across all the operations in an efficient and reliable way. This policy shows how these methods develop children's confidence in their understanding of both written and mental methods.

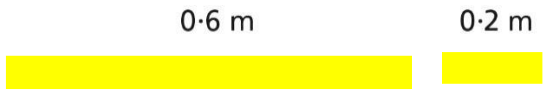
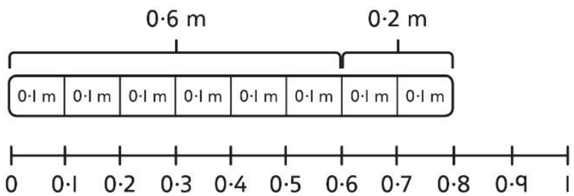
KEY STAGE 2	
In upper Key Stage 2, children build on secure foundations in calculation, and develop fluency, accuracy and flexibility in their approach to the four operations. They work with whole numbers and adapt their skills to work with decimals, and they continue to develop their ability to select 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 They adapt methods to calculate efficiently and effectively, ensuring understanding of place value at every stage. Children compare and contrast methods and decide on the most efficient method to use.	**Multiplication and division:** 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 developed and adapted for division by single-digit and 2-digit numbers and are understood alongside 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.

<table>
<tr><th colspan="4">Year 5</th></tr>
<tr><th></th><th>Concrete</th><th>Pictorial</th><th>Abstract</th></tr>
<tr>
<td>Year 5
Addition</td>
<td>Addition:

</td>
<td colspan="2">Note: When using decimal points, ensure they are half way down the digit like this:


When using commas to separate place value columns, ensure the comma is sitting on the line, like this:
2,345,678</td>
</tr>
<tr>
<td>Column addition with whole numbers</td>
<td colspan="2">Represent additions, using place value equipment on a place value grid alongside written methods. Ensure you explore this without exchange first (as the children have previously done in Y4) and then progress onto exchange (also done in Y4!)


I need to exchange 10 tens for a 100.
$\begin{array}{cccccc} & TTh & Th & H & T & O \\ \hline & 2 & 0 & 1 & 5 & 3 \\ + & 1 & 9 & 1 & 7 & 5 \\ \hline & 3 & 9 & 3 & 2 & 8 \\ \hline & & & 1 & & \end{array}$</td>
<td>Use column addition, including exchanges.
19,175 + 18,417 = 37,592
$\begin{array}{cccccc} & TTh & Th & H & T & O \\ \hline & 1 & 9 & 1 & 7 & 5 \\ + & 1 & 8 & 4 & 1 & 7 \\ \hline & 3 & 7 & 5 & 9 & 2 \\ \hline & 1 & & & 1 & \end{array}$</td>
</tr>
</table>

<table>
<tr>
<td>Representing additions</td>
<td colspan="3">Bar models represent addition of two or more numbers in the context of problem solving.

</td>
</tr>
<tr>
<td>Adding tenths</td>
<td>Link measure with addition of decimals.

Two lengths of paper are 0·6 m and 0·2 m.
How long are they when added together?

</td>
<td>Use a bar model with a number line to add tenths.


0·6 + 0·2 = 0·8
6 tenths + 2 tenths = 8 tenths

<table>
<tr><th>Ones</th><th>tenths)</th></tr>
<tr><td>0</td><td>6</td></tr>
<tr><td>0</td><td>2</td></tr>
<tr><td>0</td><td>8</td></tr>
</table></td>
<td>Understand the link with adding fractions.

$\frac{6}{10} + \frac{2}{10} = \frac{8}{10}$

6 tenths + 2 tenths = 8 tenths
0·6 + 0·2 = 0·8</td>
</tr>
<tr>
<td>Adding decimals using column addition</td>
<td colspan="2">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.</td>
<td>Add using a column method, ensuring that children understand the link with place value.</td>
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</table>

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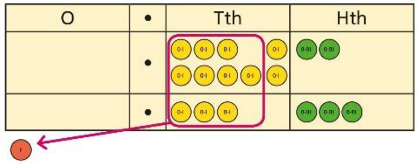
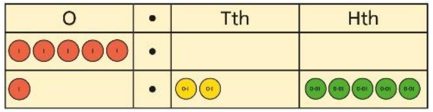
<tr>
<td></td>
<td colspan="2">



$$\begin{array}{rcrr} & O & \cdot\ Tth & Hth \\ & 0 & \cdot\ 9 & 2 \\ + & 0 & \cdot\ 3 & 3 \\ \hline & 1 & \cdot\ 2 & 5 \\ & {\scriptstyle 1} & & \end{array}$$

Include examples where the numbers of decimal places are different.



$$\begin{array}{rcrr} & O & \cdot\ Tth & Hth \\ & 5 & \cdot\ 0 & 0 \\ + & 1 & \cdot\ 2 & 5 \\ \hline & 6 & \cdot\ 2 & 5 \end{array}$$

</td>
<td>

$$\begin{array}{rcrr} & O & \cdot\ Tth & Hth \\ & 0 & \cdot\ 2 & 3 \\ + & 0 & \cdot\ 4 & 5 \\ \hline & 0 & \cdot\ 6 & 8 \end{array}$$

Include exchange where required, alongside an understanding of place value.

$$\begin{array}{rcrr} & O & \cdot\ Tth & Hth \\ & 0 & \cdot\ 9 & 2 \\ + & 0 & \cdot\ 3 & 3 \\ \hline & 1 & \cdot\ 2 & 5 \\ & {\scriptstyle 1} & & \end{array}$$

Include additions where the numbers of decimal places are different.

3.4 + 0.65 = ?

$$\begin{array}{rcrr} & O & \cdot\ Tth & Hth \\ & 3 & \cdot\ 4 & 0 \\ + & 0 & \cdot\ 6 & 5 \\ \hline & & \cdot & \\ \hline \end{array}$$

</td>
</tr>
<tr>
<td>

Year 5 Subtraction

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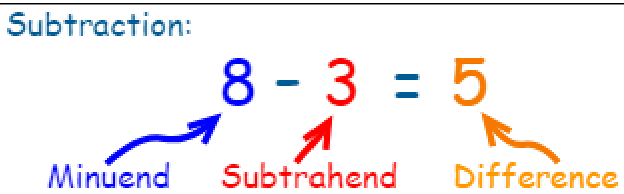
<td colspan="3">



</td>
</tr>
<tr>
<td>

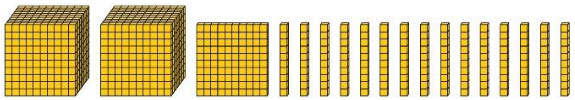
Column subtraction with whole numbers

Refer back to the Y4 calculation policy for steps prior to exchanging

</td>
<td>

Use place value equipment to understand where exchanges are required.

2,250 – 1,070



</td>
<td>

Represent the stages of the calculation using place value equipment on a grid alongside the calculation, including exchanges where required.

15,735 − 2,582 = 13,153

</td>
<td>

Use column subtraction methods with exchange where required.

$$\begin{array}{rccccc} & TTh & Th & H & T & O \\ & {}^{5}\cancel{6} & {}^{11}\cancel{2} & {}^{1}0 & 9 & 7 \\ - & 1 & 8 & 5 & 3 & 4 \\ \hline & 4 & 3 & 5 & 6 & 3 \\ \hline \end{array}$$

62,097 − 18,534 = 43,563

</td>
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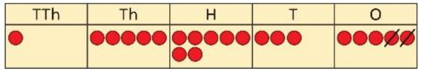
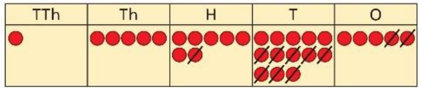
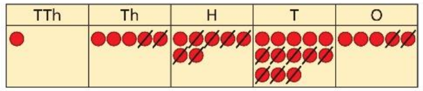
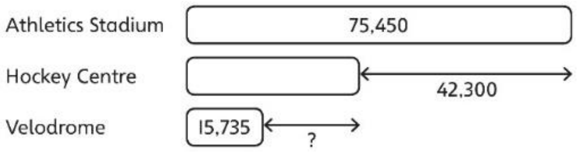
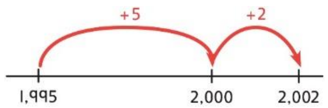
</table>

<table>
<tr>
<td>with subtraction</td>
<td></td>
<td>

TTh Th H T O
1 5 7 3 5
− 2 5 8 2
3

Now subtract the 10s. Exchange 1 hundred for 10 tens.

TTh Th H T O
1 5 $\cancel{7}^{6}$ $^{1}3$ 5
− 2 5 8 2
5 3

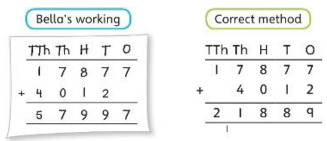
Subtract the 100s, 1,000s and 10,000s.

TTh Th H T O
1 5 $\cancel{7}^{6}$ $^{1}3$ 5
− 2 5 8 2
1 3 1 5 3
</td>
<td></td>
</tr>
<tr>
<td>Choosing efficient methods</td>
<td colspan="2">Bar models represent subtractions in problem contexts, including ‘find the difference’.


</td>
<td>To subtract two large numbers that are close, children find the difference by counting on.
2,002 − 1,995 = ?


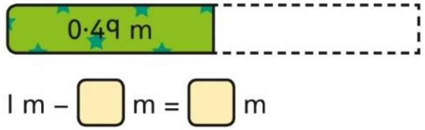
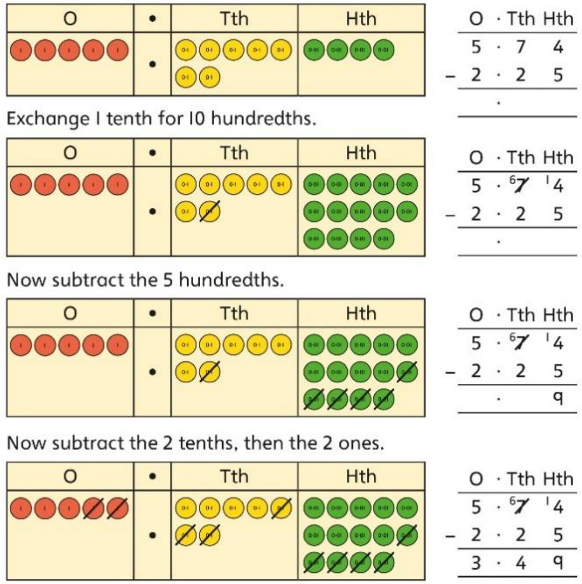
Use addition to check subtractions.
I calculated 7,546 − 2,355 = 5,191.
I will check using the inverse.

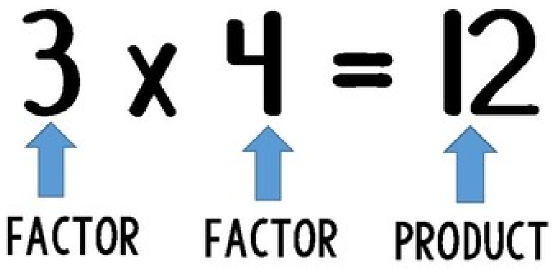
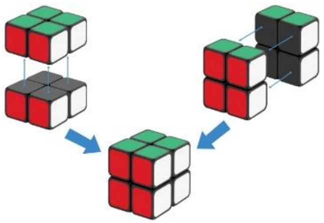
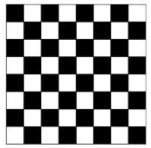
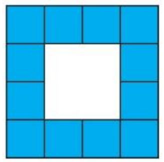
Refer back to ‘Same difference’ strategy used in Y4

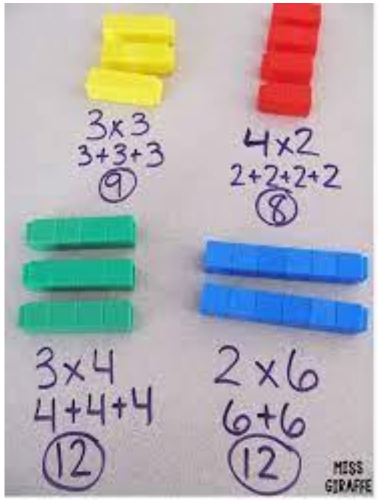
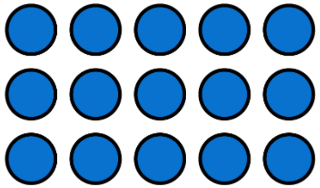
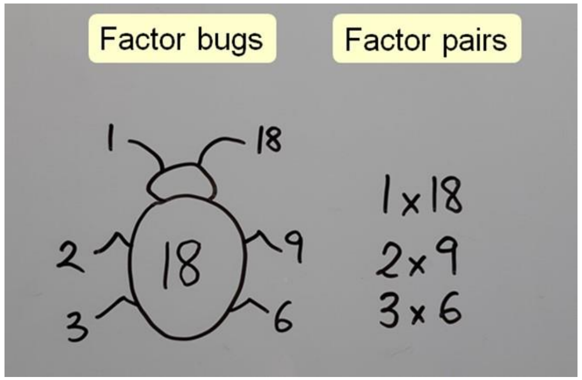
Or

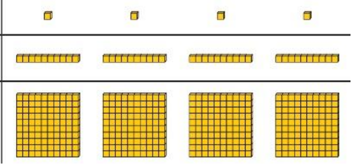
Children can explain the mistake made when the columns have not been ordered correctly.


</td>
</tr>
</table>

Subtracting decimals	Explore complements to a whole number by working in the context of length.  *1 − 0·49 = ?* This could also be explored on a number line, where the children use their number bonds to help them ‘count on’. For example, “How many to get the next tenth? How many more tenths do we need to get to 1?”	Use a place value grid to represent the stages of column subtraction, including exchanges where required. *5·74 − 2·25 = ?*  	Use column subtraction, with an understanding of place value, including subtracting numbers with different numbers of decimal places. *3·921 − 3·75 = ?* O · Tth Hth Thth 3 · 9 2 1 − 3 · 7 5 0 · Remind children that exchange works the same way with decimals as it does with integers.

Year 5 Multiplication			
Understanding square numbers	Use cubes or counters to explore the meaning of 'square numbers'. *25 is a square number because it is made from 5 rows of 5.* Use cubes to explore cube numbers.  *8 is a cube number.*	Use images to explore examples and non-examples of square numbers.  *8 × 8 = 64* *8^2 = 64*  *12 is not a square number, because you cannot multiply a whole number by itself to make 12.*	Understand the pattern of square numbers in the multiplication tables. Use a multiplication grid to circle each square number. Can children spot a pattern?
Understanding factors and multiples	Retrieve knowledge from Y3 and 4 about arrays. Explore different numbers. Why do some numbers have many factors? Why do	Use the array to identify that 3 and 5 are factors of 15.	Children to explore pattern finding to understand factor pairs. Identifying that as

	some numbers have only 2 factors? What do you notice?  	 Children building on their Y3 knowledge of commutativity to identify 3x5 and 5x3 Children to manipulate the array to identify other factors (1 x 15).	one factor halves, the other factor doubles is called factorisation. For example: 1 x 24 = 24 2 x 12 = 24 4 x 6 = 24 8 x 3 = 24 Another way children may want to explore this is by using their knowledge of times tables: 1 x 24 = 24 2 x 12 = 24 3 x 8 = 24 4 x 6 = 24 Why would 5 not be a factor of 24? Use factor bugs to identify that factors come in pairs (although factors for square numbers are the same!) 
Multiplying by 10, 100 and 1,000	Use place value equipment to multiply by 10, 100 and 1,000 by unitising.	Understand the place value effect of multiplication by 10, 100 and 1000 on integers	Understand how exchange relates to the digits when multiplying by 10, 100 and 1,000.

<table>
<tr>
<td></td>
<td>
4 × 1 = 4 ones = 4
4 × 10 = 4 tens = 40
4 × 100 = 4 hundreds = 400

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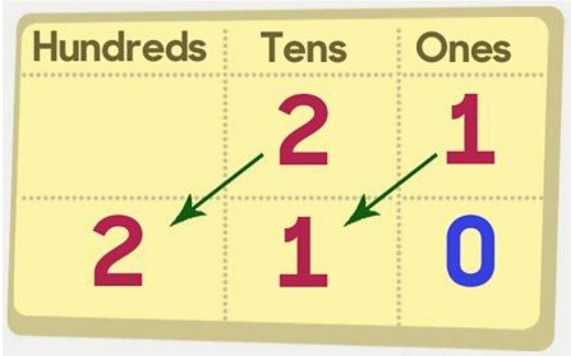
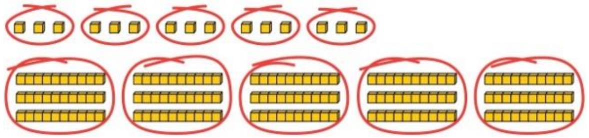
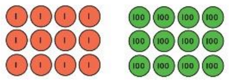
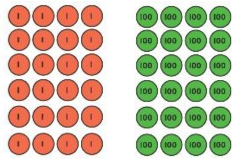


<table>
<tr><th></th><th>TH</th><th>H</th><th>T</th><th>O</th></tr>
<tr><td></td><td></td><td></td><td>1</td><td>4</td></tr>
<tr><td>× 100</td><td></td><td></td><td>10 × 100</td><td>4 × 100</td></tr>
</table>
<table>
<tr><td></td><td>1</td><td>4</td><td>0</td><td>0</td></tr>
</table>
<table>
<tr><th>Ten Thousand</th><th>Thousands</th><th>Hundreds</th><th>Tens</th><th>Ones</th></tr>
<tr><td></td><td></td><td></td><td>7</td><td>2</td></tr>
</table>
<table>
<tr><td>7</td><td>2</td><td>0</td><td>0</td><td>0</td></tr>
</table>
</td>
<td>
<table>
<tr><th>H</th><th>T</th><th>O</th></tr>
<tr><td></td><td>1</td><td>7</td></tr>
</table>

17 × 10 = 170
17 × 100 = 17 × 10 × 10 = 1,700
17 × 1,000 = 17 × 10 × 10 × 10 = 17,000
</td>
</tr>
<tr>
<td>**Multiplying by multiples of 10, 100 and 1,000**</td>
<td>
Use place value equipment to explore multiplying by unitising.


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.
</td>
<td>
Use place value counters or a place value chart to represent how to multiply by multiples of 10, 100 and 1,000.



4 × 3 = 12
4 × 300 = 1,200

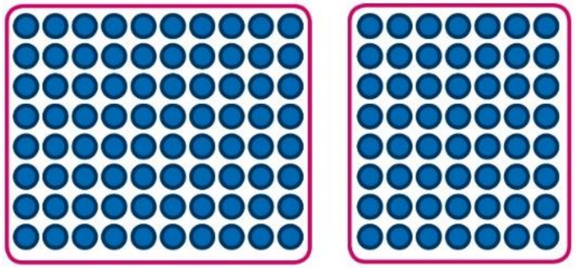
6 × 4 = 24
6 × 400 = 2,400
</td>
<td>
Use known facts and unitising to multiply.

5 × 4 = 20
5 × 40 = 200
5 × 400 = 2,000
5 × 4,000 − 20,000

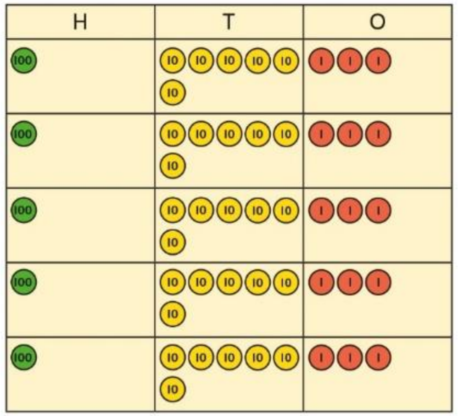
5,000 × 4 = 20,000
</td>
</tr>
</table>

<table>
<tr><td></td><td></td><td>Refer to the step above for multiplying multiples of ten, hundreds and thousands</td><td></td></tr>
<tr><td>Multiplying up to 4-digit numbers by a single digit</td><td>Explore how to use partitioning to multiply efficiently.

8 × 17 = ?


8 × 10 = 80   8 × 7 = 56
80 + 56 = 136

So, 8 × 17 = 136</td><td>Represent multiplications using place value equipment as repeated addition and add the 1s, then 10s, then 100s, then 1,000s.


</td><td>Use a column multiplication, including any required exchanges.

  1 3 6
×   6
  8 1 6
   2 3</td></tr>
<tr><td>Multiplying up to 4-digit numbers by 2-digit numbers</td><td colspan="2">Partition one number into 10s and 1s, then add the parts.

23 × 15 = ?


10 × 15 = 150   10 × 15 = 150


3 × 15 = 45

There are 345 bottles of milk in total.

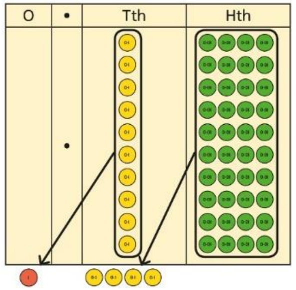
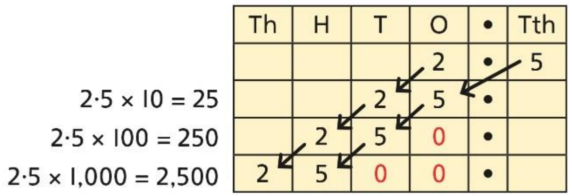
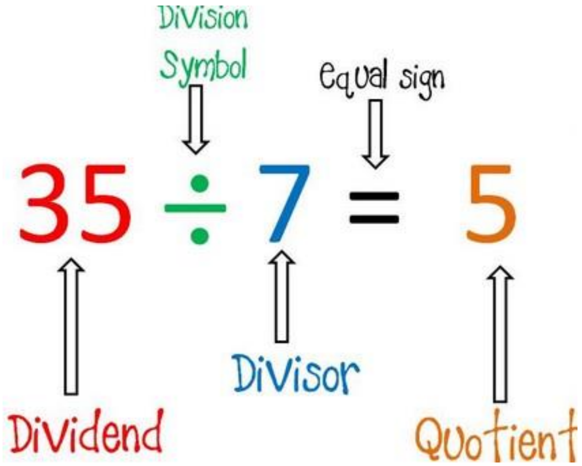
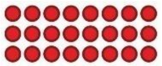
H T O
  1 5 0
  1 5 0
+   4 5
  3 4 5
  1</td><td>Use column multiplication, ensuring understanding of place value at each stage.

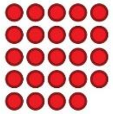
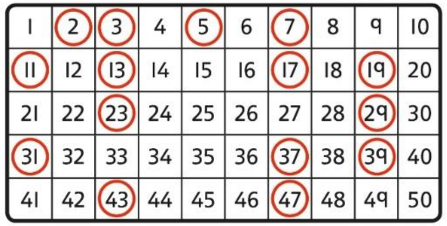
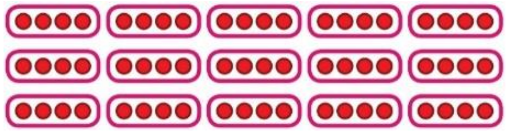
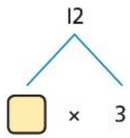
   3 4
× 2 7
2 3 $_2$8   34 × 7

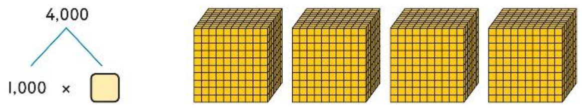
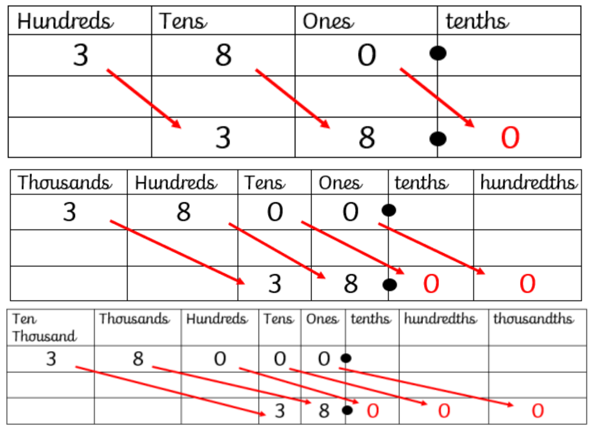
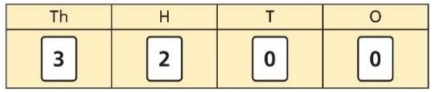
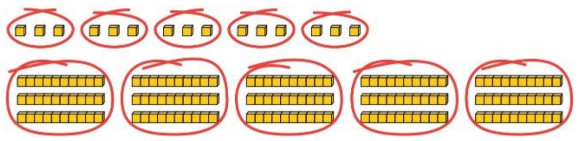
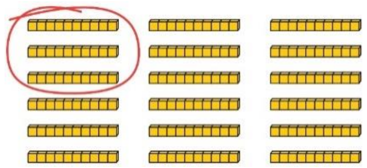
   3 4
× 2 7
2 3 $_2$8   34 × 7
6 8 0   34 × 20</td></tr>
</table>

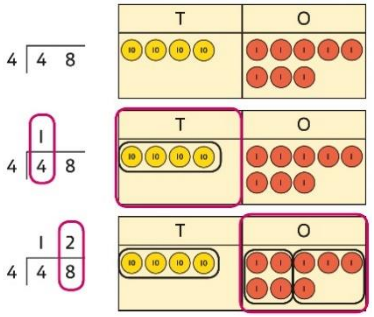
<table>
<tr>
<td></td>
<td colspan="2">23 × 15 = 345

Use your judgement and knowledge of your children to decide if you can do (20 x 15) + (3 x 15) as an alternative.</td>
<td>$$\begin{array}{rl} 34 & \\ \times\ 27 & \\ \hline 23_{2}8 & 34 \times 7 \\ 680 & 34 \times 20 \\ \hline 918 & 34 \times 27 \\ \hline {}_{1}\ \ \ & \end{array}$$
For larger factors:
Use column multiplication, ensuring understanding of place value at each stage.
$$\begin{array}{rl} 143 & \\ \times\ 12 & \\ \hline 286 & 143 \times 2 \\ 1430 & 143 \times 10 \\ \hline 1716 & 143 \times 12 \\ \hline {}_{1}\ \ \ \ & \end{array}$$
Progress to include examples that require multiple exchanges as understanding, confidence and fluency build.
$$\begin{array}{rl} 1274 & \\ \times\ 32 & \\ \hline 25_{1}48 & 1{,}274 \times 2 \\ 38_{2}2_{1}20 & 1{,}274 \times 30 \\ \hline 40768 & 1{,}274 \times 32 \\ \hline {}_{1}\ \ \ \ \ \ \ \ & \end{array}$$
1,274 × 32 = 40,768</td>
</tr>
<tr>
<td>Multiplying decimals by 10, 100 and 1,000</td>
<td>Use place value equipment to explore and understand the exchange of 10 tenths, 10 hundredths or 10 thousandths.</td>
<td>Represent multiplication by 10 as exchange on a place value grid.</td>
<td>Understand how this exchange is represented on a place value chart.</td>
</tr>
</table>

		 *0·14 × 10 = 1·4*	
Year 5 Division			
Understanding factors and prime numbers Composite number = A number with more than 2 factors (aka not a prime!)	Use equipment to explore the factors of a given number.  *24 ÷ 3 = 8* *24 ÷ 8 = 3* *8 and 3 are factors of 24 because they divide 24 exactly.*	Understand that prime numbers are numbers with exactly two factors. *13 ÷ 1 = 13* *13 ÷ 2 = 6 r 1* *13 ÷ 4 = 4 r 1* *1 and 13 are the only factors of 13.* *13 is a prime number.*	Understand how to recognise prime and composite numbers. *I know that 31 is a prime number because it can be divided by only 1 and itself without leaving a remainder. (encourage the children to draw an array or factor bug if they are still unsure at this point)* *I know that 33 is not a prime number as it can be divided by 1, 3, 11 and 33.*

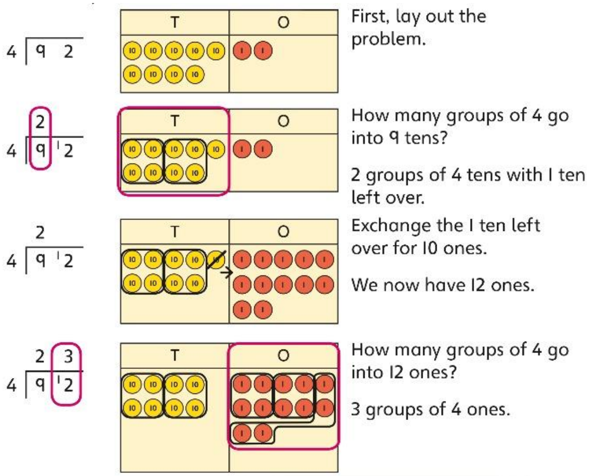
	24 ÷ 5 = 4 remainder 4.  *5 is not a factor of 24 because there is a remainder.*		*I know that 1 is not a prime number, as it has only 1 factor.* 
Understanding inverse operations and the link with multiplication, grouping and sharing	Use equipment to group and share and to explore the calculations that are present. *I have 28 counters.* *I made 7 groups of 4. There are 28 in total.* *I have 28 in total. I shared them equally into 7 groups. There are 4 in each group.* *I have 28 in total. I made groups of 4. There are 7 equal groups.*	Represent multiplicative relationships and explore the families of division facts.  *60 ÷ 4 = 15* *60 ÷ 15 = 4*	Represent the different multiplicative relationships to solve problems requiring inverse operations.  *12 ÷ 3 = ?* *12 ÷ ? = 3* *? x 3 = 12* *3 x ? = 12* Understand missing number problems for division calculations and know how to solve them using inverse operations. *22 ÷ ? = 2* *22 ÷ 2 = ?* *? ÷ 2 = 22* *? ÷ 22 = 2*
Dividing whole numbers by 10, 100 and 1,000	Use place value equipment to support unitising for division. *4,000 ÷ 1,000*	Use a place value chart to support dividing by 10, 100 and 1000	Understand how and why the digits change on a place value grid when dividing by 10, 100 or 1,000.

	 *4,000 is 4 thousands.* *4 × 1,000= 4,000* *So, 4,000 ÷ 1,000 = 4* *Be sure that you have gathered enough thousands block to model with before you teach – these are often difficult to find!*	 *Encourage your children to work out 'how many divisors can squeeze into the dividend?'*	 *3,200 ÷ 100 = ?* *So, the digits will move two places to the right.*
Dividing with multiples of 10, 100 and 1,000	Use place value equipment to represent known facts and unitising.  *15 ones put into groups of 3 ones. There are 5 groups.* *15 ÷ 3 = 5* *15 tens put into groups of 3 tens. There are 5 groups.* *150 ÷ 30 = 5*	Represent related facts with place value equipment when dividing by unitising.  *180 is 18 tens.* *18 tens divided into groups of 3 tens. There are 6 groups.* *180 ÷ 30 = 6* *Encourage your children to work out 'how many divisors can squeeze into the dividend?'*	Reason from known facts, based on understanding of unitising. Use knowledge of the inverse relationship to check. *3,000 ÷ 5 = 600* *3,000 ÷ 50 = 60* *3,000 ÷ 500 = 6* *5 × 600 = 3,000* *50 × 60 = 3,000* *500 × 6 = 3,000*

<table>
<tr>
<td>Dividing up to four digits by a single digit using short division</td>
<td colspan="2">Use place value equipment on a place value grid alongside short division.
The model uses grouping.


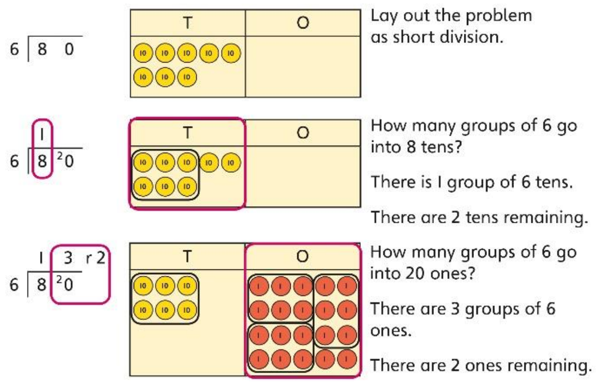
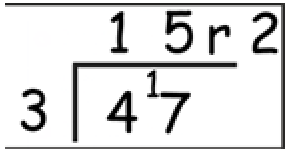
Lay out the problem as a short division.

There is 1 group of 4 in 4 tens.
There are 2 groups of 4 in 8 ones.

Work with divisions that require exchange.

</td>
<td>Use short division for up to 4-digit numbers divided by a single digit.
$$\begin{array}{r|l} & 0\quad 5\quad 5\quad 6 \\ \hline 7 & 3\quad {}^{3}8\quad {}^{3}9\quad {}^{4}2 \end{array}$$
3,892 ÷ 7 = 556

Use multiplication (inverse) to check.</td>
</tr>
<tr>
<td>Understanding remainders</td>
<td>Understand remainders using concrete versions of a problem.</td>
<td>Use short division and understand remainders as the last remaining 1s.</td>
<td>Children link their practical work to the bus stop method:</td>
</tr>
</table>

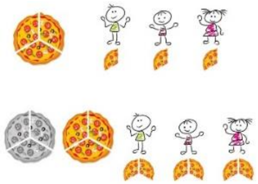
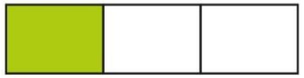
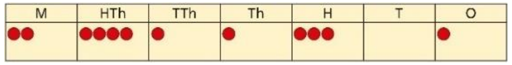
<table>
<tr>
<td></td>
<td>80 cakes divided into trays of 6.

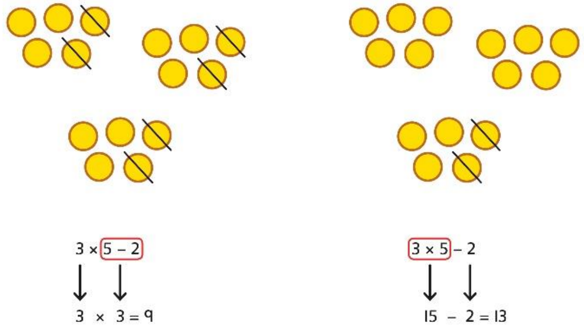
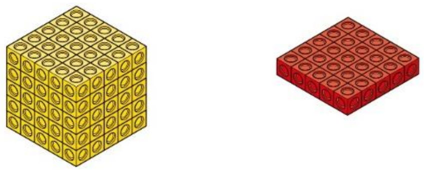
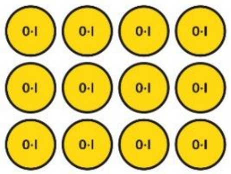
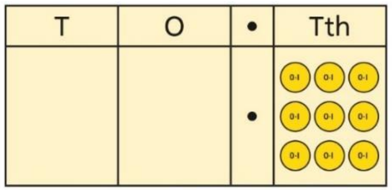
80 cakes in total. They make 13 groups of 6, with 2 remaining.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dividing decimals by 10, 100 and 1,000</td>
<td colspan="3">Refer back to previous step (dividing whole numbers by 10, 100, 1000). This step should just extend their conceptual knowledge.

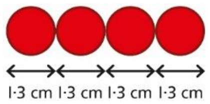
Understand the movement of digits on a place value grid.
<table>
<tr><td>O</td><td>•</td><td>Tth</td><td>Hth</td><td>Thth</td></tr>
<tr><td>0</td><td>•</td><td>8</td><td>5</td><td></td></tr>
<tr><td>0</td><td>•</td><td>0</td><td>8</td><td>5</td></tr>
</table>
0·85 ÷ 10 = 0·085

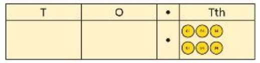
<table>
<tr><td>O</td><td>•</td><td>Tth</td><td>Hth</td><td>Thth</td></tr>
<tr><td>8</td><td>•</td><td>5</td><td></td><td></td></tr>
<tr><td>0</td><td>•</td><td>0</td><td>8</td><td>5</td></tr>
</table>
8·5 ÷ 100 = 0·085</td>
</tr>
<tr>
<td>Understanding the relationship between</td>
<td>Use sharing to explore the link between fractions and division.

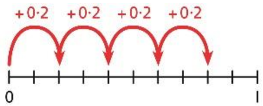
1 whole shared between 3 people.</td>
<td>Use a bar model and other fraction representations to show the link between fractions and division.</td>
<td>Use the link between division and fractions to calculate divisions.</td>
</tr>
</table>

fractions and division	*Each person receives one-third.* 	 $1 \div 3 = \frac{1}{3}$	$5 \div 4 = \frac{5}{4} = 1\frac{1}{4}$ $11 \div 4 = \frac{11}{4} = 2\frac{3}{4}$
Year 6			
	Concrete	**Pictorial**	**Abstract**
Year 6 Addition	Refer back to year 5 for previous steps. It is essential that children are fluent with the Year 5 sections of the policy.		
Selecting mental methods for larger numbers where appropriate	Represent 7-digit numbers on a place value grid, and use this to support thinking and mental methods.  *2,411,301 + 500,000 = ?* *This would be 5 more counters in the HTh place.* *So, the total is 2,911,301.* *2,411,301 + 500,000 = 2,911,301*		Use place value and unitising to support mental calculations with larger numbers. *195,000 + 6,000 = ?* *195 + 5 + 1 = 201* *195 thousands + 6 thousands = 201 thousands* *So, 195,000 + 6,000 = 201,000*
Understanding order of operations in calculations	Use equipment to model different interpretations of a calculation with more than one operation. Explore different results. *3 × 5 − 2 = ?* *Before you introduce the picture to the children, complete this step with counters. Why are the two outcomes different?*	Understand the correct order of operations in calculations by introducing BIDMAS/BODMAS. Understand how brackets affect the order of operations in a calculation. *4 + 6 × 16* *4 + 96 = 100* *(4 + 6) × 16* *10 × 16 = 160*	

			
Year 6 Multiplication			
Understanding cubed numbers and volume	Use equipment to understand square numbers and cube numbers.  *$5 \times 5 = 5^2 = 25$* *$5 \times 5 \times 5 = 5^3 = 25 \times 5 = 125$*		*Identify patterns using indices. For example:* *$5 \times 5 = 5^2 = 25$* *$5 \times 5 \times 5 = 5^3 = 25 \times 5 = 125$* *$5 \times 5 \times 5 \times 5 = 5^4 = 625$* *This is an ideal opportunity to explore volume.*
Multiplying decimals	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.*	Represent calculations on a place value grid. $3 \times 3 = 9$ $3 \times 0{\cdot}3 = 0{\cdot}9$ 	Use known facts to multiply decimals. *$4 \times 3 = 12$* *$4 \times 0{\cdot}3 = 1{\cdot}2$* *$4 \times 0{\cdot}03 = 0{\cdot}12$* *$20 \times 5 = 100$* *$20 \times 0{\cdot}5 = 10$* *$20 \times 0{\cdot}05 = 1$* Find families of facts from a known multiplication.

<table>
<tr>
<td></td>
<td>


4 × 1 cm = 4 cm
4 × 0·3 cm = 1.2 cm
4 × 1·3 = 4 + 1·2 = 5·2 cm
</td>
<td>
Understand the link between multiplying decimals and repeated addition.




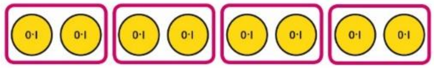
</td>
<td>
I know that 18 × 4 = 72.

This can help me work out:

1·8 × 4 = ?
18 × 0·4 = ?
180 × 0·4 = ?
18 × 0·04 = ?

Use a place value grid to understand the effects of multiplying decimals.
<table>
<tr><th></th><th>H</th><th>T</th><th>O</th><th>•</th><th>Tth</th><th>Hth</th></tr>
<tr><td>2 × 3</td><td></td><td></td><td>6</td><td>•</td><td></td><td></td></tr>
<tr><td>0·2 × 3</td><td></td><td></td><td>0</td><td>•</td><td>6</td><td></td></tr>
<tr><td>0·02 × 3</td><td></td><td></td><td></td><td>•</td><td></td><td></td></tr>
</table>
</td>
</tr>
<tr>
<td>Year 6
Division</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dividing by a 2-digit number using long division</td>
<td colspan="3">
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.

432 ÷ 15 = ?
</td>
</tr>
</table>

	$\begin{array}{r} 28.8 \\ 15\overline{)432.0} \\ 30 \\ \hline 132 \\ 120 \\ \hline 120 \\ 120 \\ \hline 0 \end{array}$ 15 30 45 60 75 90 105 120 135	
Dividing decimals	Use place value equipment to explore division of decimals.  *8 tenths divided into 4 groups. 2 tenths in each group.*	Use short division to divide decimals with up to 2 decimal places. $8\overline{)4 \cdot 2\ \ 4}$ $\begin{array}{r} 0\ \cdot\ \ \\ 8\overline{)4 \cdot {}^{4}2\ \ 4} \end{array}$ $\begin{array}{r} 0\ \cdot\ 5\ \\ 8\overline{)4 \cdot {}^{4}2\ {}^{2}4} \end{array}$ $\begin{array}{r} 0\ \cdot\ 5\ \ 3 \\ 8\overline{)4 \cdot {}^{4}2\ {}^{2}4} \end{array}$