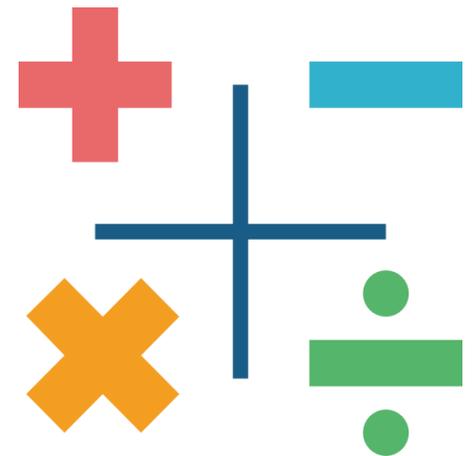


Francis askew primary school

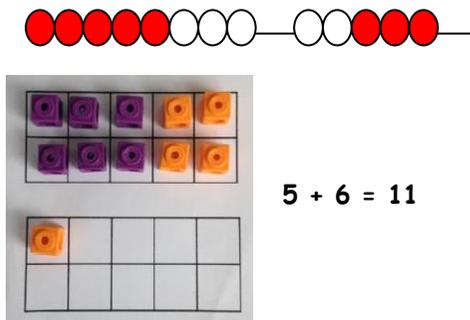
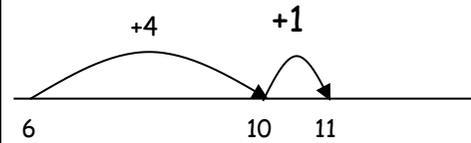
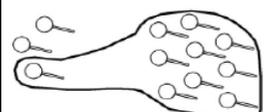
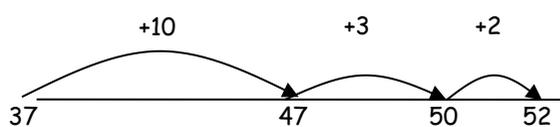


CALCULATION POLICY



Addition		
Skill	Year	Representation and models
Add two 1-digit numbers to 10	1	Part-whole model Bar model Number shapes Ten frames (within 10) Bead strings Number tracks
Add 1 and 2-digit numbers to 20	1	Part-whole model Bar model Number shapes Ten frames (within 20) Bead strings (20) Number tracks Number lines (labelled) Straws
Add three 1-digit numbers	2	Part-whole model Bar model Ten frames (within 20) Number shapes
Add 1 and 2-digit numbers to 100	2	Part-whole model Bar model Number lines (labelled) Number lines (blank) Straws Hundred square
Add two 2-digit numbers	2	Part-whole model Bar model Number lines (blank) Straws Base 10 Place value counters Column addition
Add with up to 3-digits	3	Part-whole model Bar model Column addition Base 10 Place value counters
Add with up to 4-digits	4	Part-whole model Bar model Base 10 Place value counters

		Column addition	
Add with more than 4 digits	5	Part-whole model Bar model	Place value counters Column addition
Add with up to 3 decimal places	5	Part-whole model Bar model	Place value counters Column addition

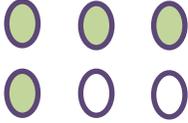
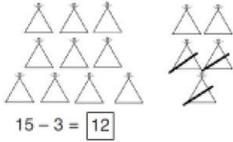
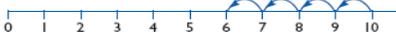
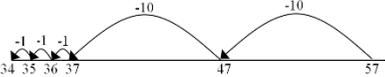
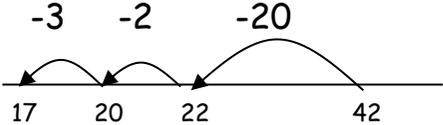
Addition			
	Concrete	Pictorial	Abstract
Regrouping to make 10	<p>Start with the bigger number and use the smaller number to make 10. Bead strings or 10 frames and objects can be used to illustrate addition including bridging through ten by counting on 2 then counting on 3.</p>  <p>$5 + 6 = 11$</p>	<p>Use pictures or a number line. Regroup or partition the smaller number to make 10.</p> $6 + 5 = 11$   <p>$3 + 9 =$</p>	<p>Bridging through ten can help children become more efficient.</p> $37 + 15 = 52$ 

<p>Column with regrouping</p>	<p>Make both numbers on a place value grid, <i>this example is completed using place value counters.</i></p> <table border="1" style="margin: 5px auto; border-collapse: collapse; text-align: center;"> <thead> <tr style="background-color: #e0e0e0;"> <th style="width: 33%;">Hundreds</th> <th style="width: 33%;">Tens</th> <th style="width: 33%;">Ones</th> </tr> </thead> <tbody> <tr> <td>■</td> <td> </td> <td>●●●●</td> </tr> <tr> <td>■ ■ ■ ■</td> <td> </td> <td>●●●●●●●●</td> </tr> <tr style="border-top: 1px solid black;"> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p style="text-align: right; margin-right: 20px;">146</p> <p style="text-align: right; margin-right: 20px;">Add $+ 527$ units and exchange 10 ones for one 10.</p> <p style="margin-top: 10px;">Add up the rest of the columns, exchanging the 10 counters from one column for the next place value column until every column has been added.</p>	Hundreds	Tens	Ones	■		●●●●	■ ■ ■ ■		●●●●●●●●				<p>Children can draw a pictorial representation of the columns and place value counters to further support their learning and understanding.</p> <table border="1" style="margin: 5px auto; border-collapse: collapse; text-align: center;"> <thead> <tr style="background-color: #e0e0e0;"> <th style="width: 33%;">Hundreds</th> <th style="width: 33%;">Tens</th> <th style="width: 33%;">Ones</th> </tr> </thead> <tbody> <tr> <td>□</td> <td> </td> <td>●●●●●●●●</td> </tr> <tr> <td>□□□ □□</td> <td> </td> <td>●●●●●●●●</td> </tr> <tr style="border-top: 1px solid black;"> <td>600</td> <td>70</td> <td>3</td> </tr> </tbody> </table> <p style="margin-top: 10px;">Once drawn, the children group any series of counters which are greater than ten. They should circle ten of the counters before adding onto the next column (like the exchange in the previous example).</p>	Hundreds	Tens	Ones	□		●●●●●●●●	□□□ □□		●●●●●●●●	600	70	3	<p>Start by partitioning the numbers before moving on to clearly show the exchange below the addition.</p> $\begin{array}{r} 20 + 5 \\ 40 + 8 \\ \hline 60 + 13 = 73 \end{array}$ <p style="margin-top: 10px;">Children will consolidate the above and move on to carrying below the line.</p> <table style="margin: 5px auto; text-align: center;"> <tr> <td>$\begin{array}{r} 625 \\ + 48 \\ \hline 673 \\ 1 \end{array}$</td> <td>$\begin{array}{r} 783 \\ + 42 \\ \hline 825 \\ 1 \end{array}$</td> <td>$\begin{array}{r} 367 \\ + 85 \\ \hline 452 \\ 11 \end{array}$</td> </tr> </table>	$\begin{array}{r} 625 \\ + 48 \\ \hline 673 \\ 1 \end{array}$	$\begin{array}{r} 783 \\ + 42 \\ \hline 825 \\ 1 \end{array}$	$\begin{array}{r} 367 \\ + 85 \\ \hline 452 \\ 11 \end{array}$
Hundreds	Tens	Ones																												
■		●●●●																												
■ ■ ■ ■		●●●●●●●●																												
Hundreds	Tens	Ones																												
□		●●●●●●●●																												
□□□ □□		●●●●●●●●																												
600	70	3																												
$\begin{array}{r} 625 \\ + 48 \\ \hline 673 \\ 1 \end{array}$	$\begin{array}{r} 783 \\ + 42 \\ \hline 825 \\ 1 \end{array}$	$\begin{array}{r} 367 \\ + 85 \\ \hline 452 \\ 11 \end{array}$																												

<p>National Curriculum Guidance</p>	<p>Addition and subtraction</p>																																																																																									
	<p>789 + 642 becomes</p> <table style="margin: 5px auto; text-align: center;"> <tr><td>7</td><td>8</td><td>9</td></tr> <tr><td>+</td><td>6</td><td>4</td><td>2</td></tr> <tr><td colspan="4"><hr/></td></tr> <tr><td>1</td><td>4</td><td>3</td><td>1</td></tr> <tr><td colspan="4"><hr/></td></tr> <tr><td></td><td>1</td><td>1</td><td></td></tr> </table> <p style="text-align: center; margin-top: 10px;">Answer: 1431</p>	7	8	9	+	6	4	2	<hr/>				1	4	3	1	<hr/>					1	1		<p>874 - 523 becomes</p> <table style="margin: 5px auto; text-align: center;"> <tr><td>8</td><td>7</td><td>4</td></tr> <tr><td>-</td><td>5</td><td>2</td><td>3</td></tr> <tr><td colspan="4"><hr/></td></tr> <tr><td>3</td><td>5</td><td>1</td></tr> <tr><td colspan="4"><hr/></td></tr> </table> <p style="text-align: center; margin-top: 10px;">Answer: 351</p>	8	7	4	-	5	2	3	<hr/>				3	5	1	<hr/>				<p>932 - 457 becomes</p> <table style="margin: 5px auto; text-align: center;"> <tr><td>8</td><td>12</td><td>1</td></tr> <tr><td>9</td><td>3</td><td>2</td></tr> <tr><td>-</td><td>4</td><td>5</td><td>7</td></tr> <tr><td colspan="4"><hr/></td></tr> <tr><td>4</td><td>7</td><td>5</td></tr> <tr><td colspan="4"><hr/></td></tr> </table> <p style="text-align: center; margin-top: 10px;">Answer: 475</p>	8	12	1	9	3	2	-	4	5	7	<hr/>				4	7	5	<hr/>				<p>932 - 457 becomes</p> <table style="margin: 5px auto; text-align: center;"> <tr><td></td><td>1</td><td>1</td></tr> <tr><td>9</td><td>3</td><td>2</td></tr> <tr><td>-</td><td>4</td><td>5</td><td>7</td></tr> <tr><td colspan="4"><hr/></td></tr> <tr><td></td><td>5</td><td>6</td></tr> <tr><td>4</td><td>7</td><td>5</td></tr> <tr><td colspan="4"><hr/></td></tr> </table> <p style="text-align: center; margin-top: 10px;">Answer: 475</p>		1	1	9	3	2	-	4	5	7	<hr/>					5	6	4	7	5	<hr/>			
7	8	9																																																																																								
+	6	4	2																																																																																							
<hr/>																																																																																										
1	4	3	1																																																																																							
<hr/>																																																																																										
	1	1																																																																																								
8	7	4																																																																																								
-	5	2	3																																																																																							
<hr/>																																																																																										
3	5	1																																																																																								
<hr/>																																																																																										
8	12	1																																																																																								
9	3	2																																																																																								
-	4	5	7																																																																																							
<hr/>																																																																																										
4	7	5																																																																																								
<hr/>																																																																																										
	1	1																																																																																								
9	3	2																																																																																								
-	4	5	7																																																																																							
<hr/>																																																																																										
	5	6																																																																																								
4	7	5																																																																																								
<hr/>																																																																																										

Subtraction		
Skill	Year	Representation and models
Subtract two 1-digit numbers to 10	1	Part-whole model Bar model Number shapes Ten frames (within 10) Bead strings Number tracks
Subtract 1 and 2-digit numbers to 20	1	Part-whole model Bar model Number shapes Ten frames (within 20) Bead strings (20) Number tracks Number lines (labelled) Straws
Subtract 1 and 2-digit numbers to 100	2	Part-whole model Bar model Number lines (labelled) Number lines (blank) Straws Hundred square
Subtract two 2-digit numbers	2	Part-whole model Bar model Number lines (blank) Straws Base 10 Place value counters Column subtraction
Subtract with up to 3-digits	3	Part-whole model Bar model Column subtraction Base 10 Place value counters
Subtract with up to 4-digits	4	Part-whole model Bar model Column subtraction Base 10 Place value counters
Subtract with more than 4 digits	5	Part-whole model Bar model Place value counters Column subtraction
Subtract with up to 3 decimal places	5	Part-whole model Bar model Place value counters Column subtraction

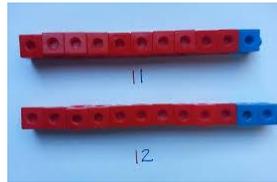
Subtraction

	Concrete	Pictorial	Abstract
Taking away ones	<p>Use physical objects, counters, cubes etc., to show how objects can be taken away.</p> 	<p>Cross out drawn objects to show what has been taken away.</p> 	$18 - 3 = 15$ $8 - 2 = 6$
Counting back	<p>Make the larger number in your subtraction. Move the beads along your bead string as you count backwards in ones.</p>  <p>Use counters and move them away from the group as you take them away counting backwards as you go.</p> 	<p>Children to also use number lines to count back.</p> <p>10 and 4 less</p>  <p>Start at the bigger number and count back the smaller number showing the jumps on the number line.</p>  <p>This can progress all the way to counting back using two 2 digit numbers. Then helping children to become more efficient by subtracting the units in one jump (by using the known fact $7 - 3 = 4$). Subtracting the tens in one jump and the units in one jump. Bridging through ten can help children become more efficient.</p> <p>$42 - 25 = 17$</p> 	$18 - 3 = 15$ $8 - 2 = 6$

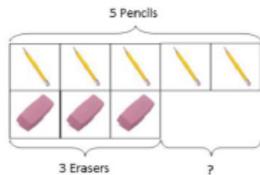
Counting on – finding the difference

Compare amounts and objects to find the difference.

Use cubes to build towers or make bars to find the difference.



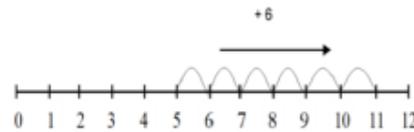
Use basic bar models with items to find the difference.



A teddy costs 50p and doll costs 20p. How much more does the teddy cost?

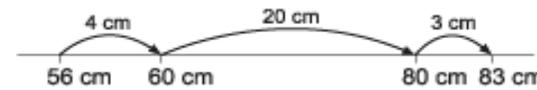
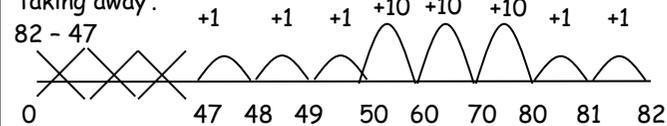


Using a number line to count on.

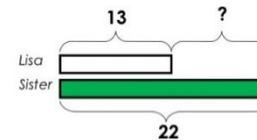


$$11 - 5 = 6$$

When dealing with larger numbers, the number line should still show 0 so children can cross out the section from 0 to the smallest number. They then associate this method with 'taking away'.



Using the bar method.

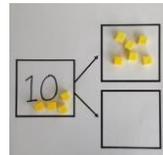


$$18 - 3 = 15$$

$$8 - 2 = 6$$

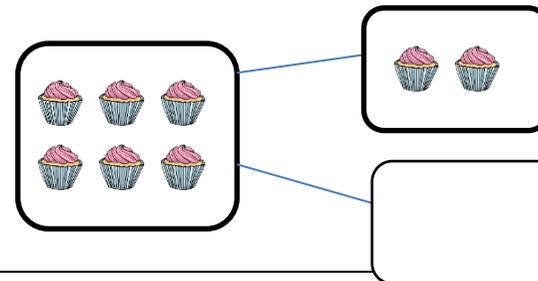
Part part whole

Link to addition- use the part whole model to help explain the inverse between addition and subtraction.

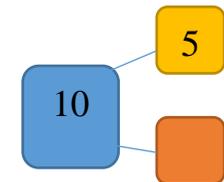


If 10 is the whole and 6 is one of the parts. What is the other part?

Use a pictorial representation of objects to show the part-part whole model.

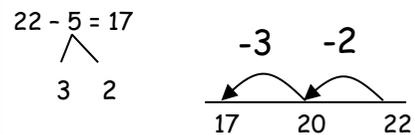
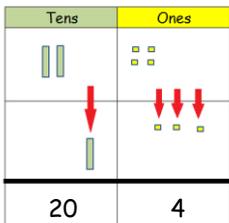
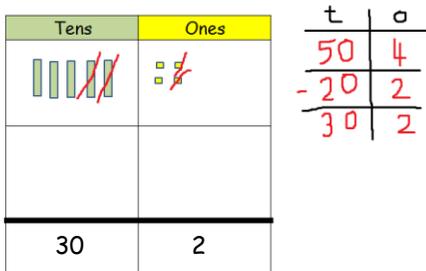


Move to using numerals within the part whole model.

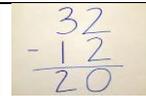
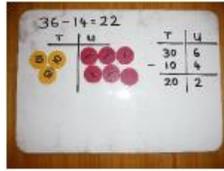


$10 - 6 = ?$

Subtraction

	Concrete	Pictorial	Abstract
Make 10	<p>Make 14 on the ten frame. Take away the four first to make 10 and then takeaway one more so you have taken away 5. You are left with the answer of 9.</p> <p>$14 - 5 = 9$</p> 	<p>Using a numberline whilst partitioning the number you're subtracting.</p> <p>Start at 22. Take away 2 to reach 20. Then take away the remaining 3 so you have taken away 5 altogether. You have reached your answer.</p> <p>$22 - 5 = 17$</p> 	<p>$16 - 8 =$</p> <p>How many do we take off to reach the next 10?</p> <p>How many do we have left to take off?</p>
Column method without regrouping	<p>Use Base 10 to make the bigger number then take the smaller number away. Always write the calculation alongside, as seen in the example below.</p> <p>$37 - 13 =$</p> 	<p>Draw the Base 10 or place value counters alongside the written calculation to help to show working.</p> 	<p>Initially, the children will be taught using examples that do not need the children to exchange.</p> <p>Partitioning and decomposition.</p> <p>e.g.</p> $\begin{array}{r} 89 \\ - 57 \\ \hline \end{array} = \begin{array}{r} \text{tens} \quad \text{ones} \\ 80 + 9 \\ - 50 + 7 \\ \hline 30 + 2 = \end{array}$ <p>32</p> <p>This will eventually lead to:</p>

Show how you partition numbers to subtract. Again make the larger number first.



Column method with regrouping

Use Base 10 to start with before moving on to *place value counters*. Start with one exchange before moving onto subtractions with 2 exchanges.

Make the larger number with the place value counters

Hundreds	Tens	Ones	Calculation
■ ■		● ● ● ●	234
			- 88
<hr/>			

Start with the ones, can I take away 8 from 4 easily? I need to exchange one of the tens for ten ones.

Hundreds	Tens	Ones	Calculation
■ ■		● ● ● ● ● ● ● ●	234
			- 88
<hr/>			

Now I can subtract the ones.

Now look at the tens, can I take away 8 tens easily? I need to exchange one hundred for ten

Hundreds	Tens	Ones	Calculation
■ ■		● ● ● ● ● ● ● ●	234
			- 88
<hr/>			

Draw the counters onto a place value grid and show what you have taken away by crossing the counters out as well as clearly showing the exchanges you make.

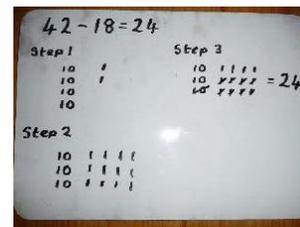
Hundreds	Tens	Ones
■ ■ ■ ■ ■ ■		■ ■ ■ ■ ■ ■
■ ■ ■ ■ ■ ■	 	■ ■ ■ ■ ■ ■
500 600	120	6
- 200	70	5
<hr/>		
300	50	1

Calculation

$$\begin{array}{r} 5 \text{ } 1 \\ 626 \\ - 275 \\ \hline 351 \end{array}$$

When confident, children can find their own way to record the exchange/regrouping.

Just writing the numbers as shown here shows that the child understands the method and knows when to exchange/regroup.



Partitioning and decomposition
Children can start their formal written method by partitioning the number into clear place value columns.

$$\begin{array}{r} 754 = \\ - 86 \\ \hline \end{array}$$

H T O

Step 1 700 + 50 + 4

$$\begin{array}{r} - \\ \hline 80 + 6 \end{array}$$

H T O

Step 2 700 + 40 + 14

(exchange T-O)

$$\begin{array}{r} - \\ \hline 80 + 6 \end{array}$$

H T O

Step 3 600 + 140 + 14

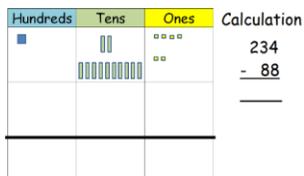
(exchange H-T)

$$\begin{array}{r} - \\ \hline 80 + 6 \end{array}$$

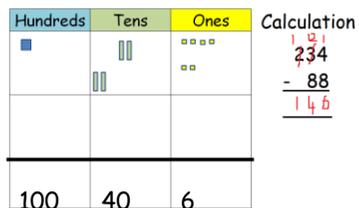
$$600 + 60 + 8 = 668$$

This would be recorded by the children as

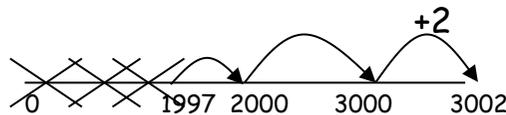
tens. Now I can take away eight tens and complete the subtraction.



Show the written methods beside to gather understanding.



Where the numbers are involved in the calculation are close together or near to multiples of 10, 100 etc., counting on using a number line should be used.



$$\begin{array}{r} \cancel{700} + \cancel{50} + \cancel{14} \\ - \quad \quad \quad 80 + 6 \\ \hline 600 + 60 + 8 = \end{array}$$

668

Decomposition

When children are secure with the previous method they move on to decomposition.

$$\begin{array}{r} 614 \\ \cancel{7} \cancel{14} \\ - \quad 86 \\ \hline 668 \end{array}$$

National Curriculum Guidance

Addition and subtraction

789 + 642 becomes

$$\begin{array}{r} 7 \quad 8 \quad 9 \\ + 6 \quad 4 \quad 2 \\ \hline 1 \quad 4 \quad 3 \quad 1 \\ \hline 1 \quad 1 \end{array}$$

Answer: 1431

874 - 523 becomes

$$\begin{array}{r} 8 \quad 7 \quad 4 \\ - 5 \quad 2 \quad 3 \\ \hline 3 \quad 5 \quad 1 \end{array}$$

Answer: 351

932 - 457 becomes

$$\begin{array}{r} 8 \quad 12 \quad 1 \\ \cancel{9} \quad \cancel{3} \quad 2 \\ - 4 \quad 5 \quad 7 \\ \hline 4 \quad 7 \quad 5 \end{array}$$

Answer: 475

932 - 457 becomes

$$\begin{array}{r} 1 \quad 1 \\ \cancel{9} \quad \cancel{3} \quad 2 \\ - 4 \quad 5 \quad 7 \\ \hline 5 \quad 6 \\ \hline 4 \quad 7 \quad 5 \end{array}$$

Answer: 475

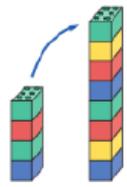
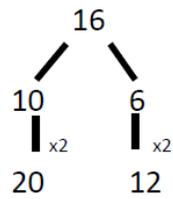
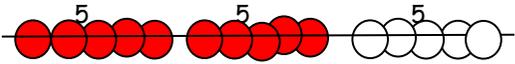
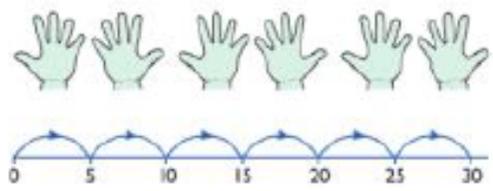
Multiplication

Skill (times table facts)	Year	Representation and models
Recall and use multiplication and division facts for the 2-, 5- and 10-times table	2	Bar model Number shapes Counters Money Ten frames Bead strings Number lines Everyday objects
Recall and use multiplication and division facts for the 3- and 4-times table	3	Hundred square Number shapes Counters Bead strings Number lines Everyday objects
Recall and use multiplication and division facts for the 8-times table	3	Hundred square Number shapes Everyday objects Bead strings Number tracks
Recall and use multiplication and division facts for the 6-times table	4	Hundred square Number shapes Everyday objects Bead strings Number tracks
Recall and use multiplication and division facts for the 7-times table	4	Hundred square Number shapes Bead strings Number lines
Recall and use multiplication and division facts for the 9-times table	4	Hundred square Number shapes Bead strings Number lines
Recall and use multiplication and division facts for the 11-times table	4	Hundred square Base 10 Place value counters Number lines
Recall and use multiplication and division facts for the 12-times table	4	Hundred square Base 10 Place value counters Number lines

Multiplication

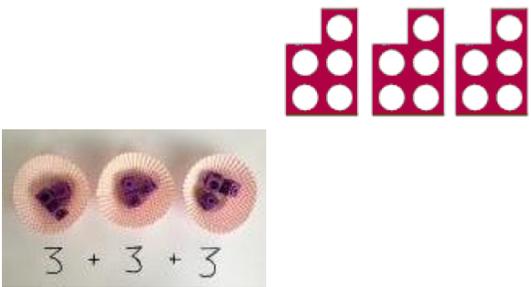
Skill	Year	Representation and models	
Solve one-step problems with multiplication	1/2	Bar model Number shapes Counters	Ten frames Bead strings Number lines
Multiply 2-digit by 1-digit numbers	3/4	Place value counters Base 10	Short written method Expanded written method
Multiply 3-digit by 1-digit numbers	4	Place value counters Base 10	Short written method
Multiply 4-digit by 1-digit numbers	5	Place value counters Base 10	Short written method
Multiply 2-digit by 2-digit numbers	5	Place value counters Base 10	Short written method Grid method
Multiply 2-digit by 3-digit numbers	5	Place value counters Grid method	Short written method
Multiply 2-digit by 4-digit numbers	5/6	Formal written method	

Multiplication

	Concrete	Pictorial	Abstract
Doubling	<p>Use practical activities to show how to double a number.</p>  <p>double 4 is 8 $4 \times 2 = 8$</p>	<p>Draw pictures to show how to double a number.</p> <p>Double 8</p> 	<p>Partition a number and then double each part before recombining it back together.</p> 
Counting in multiples	<p>Count in multiples supported by concrete objects in equal groups (commutativity).</p>  <p>Show on bead bar or on a number line:</p> <p>$3 \times 5 = 5 + 5 + 5$</p> 	<p>Use a number line or pictures to continue support in counting in multiples.</p> 	<p>Count in multiples of a number aloud.</p> <p>Write sequences with multiples of numbers.</p> <p>2, 4, 6, 8, 10</p> <p>5, 10, 15, 20, 25, 30</p>

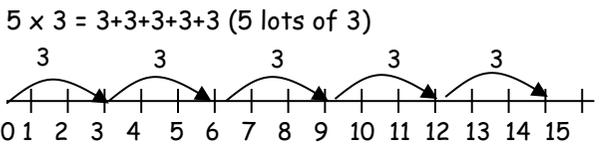
Repeated addition

Use different objects to add equal groups.



Children will develop their understanding of multiplication and use jottings to support calculation:

Repeated addition can be shown easily on a number line:

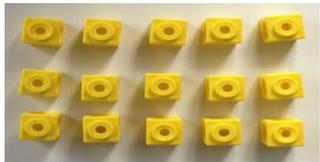


Using symbols to stand for unknown numbers to complete equations using inverse operations

- $\square \times 5 = 20$
- $3 \times \triangle = 18$
- $\square \times 0 = 32$

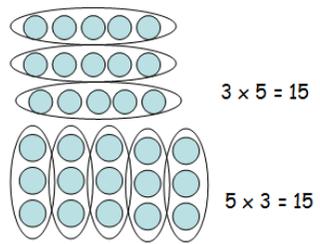
Arrays – Showing commutative multiplication

Create arrays using counters/ cubes to show multiplication sentences.



Children should be able to model a multiplication calculation using an array.

Arrays can be drawn in different rotations to find **commutative** multiplication sentences.



Use an array to write multiplication sentences and reinforce repeated addition.

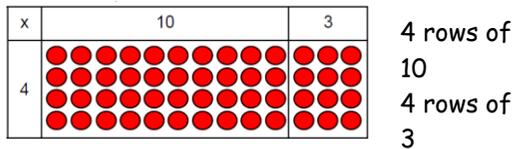
e.g.

$5 + 5 + 5 = 15$
 $3 + 3 + 3 + 3 + 3 = 15$
 $5 \times 3 = 15$

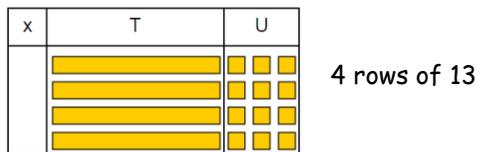
$3 \times 5 = 15$

Grid method
– NOT in
national
curriculum

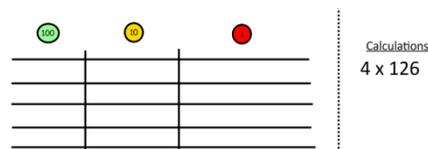
Show the link with arrays to first introduce the grid method.
e.g. $13 \times 4 =$



Move on to using Base 10 to move towards a more compact method.

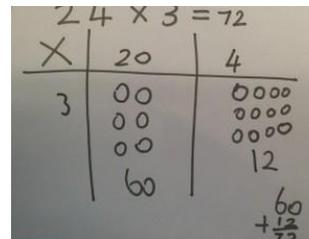


Move on to *place value counters* to show how we are finding groups of a number. We are multiplying by 4 so we need 4 rows.



Children can represent the work they have done with place value counters in a way that they understand.

They can draw the counters, using colours to show different amounts or just use circles in the different columns to show their thinking as shown below.



This can be followed by the formal written grid method.

TU x TU

72×38

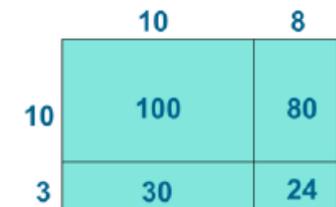
Children will approximate first:

72×38 is approximately $70 \times 40 = 2800$

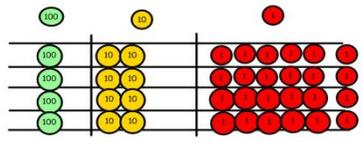
x	70	2	
30	2100	60	2100
8	560	16	+ 560
			+ 60
			+ 16
			<u>2736</u>

1

Grid method used for area work.



Fill four rows with 126.



Calculations
4 x 126

Add them together making any appropriate exchanges (see addition section).

Column multiplication

Short multiplication

24 x 6 becomes

$$\begin{array}{r} 24 \\ \times 6 \\ \hline 144 \\ \hline 2 \end{array}$$

Answer: 144

342 x 7 becomes

$$\begin{array}{r} 342 \\ \times 7 \\ \hline 2394 \\ \hline 21 \end{array}$$

Answer: 2394

2741 x 6 becomes

$$\begin{array}{r} 2741 \\ \times 6 \\ \hline 16446 \\ \hline 42 \end{array}$$

Answer: 16 446

Long multiplication 24×16 becomes

$$\begin{array}{r} 2 \\ 2 \\ \times 1 \\ \hline 2 4 \\ 1 4 \\ \hline 3 4 \end{array}$$

Answer: 384

 124×26 becomes

$$\begin{array}{r} 1 \\ 1 \\ \times \\ \hline 2 8 \\ 7 4 \\ \hline 3 2 4 \\ \hline 1 \end{array}$$

Answer: 3224

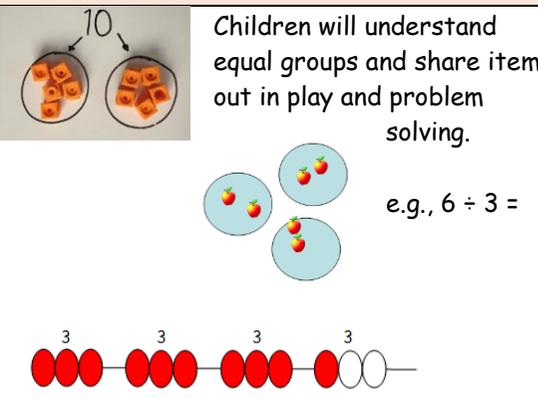
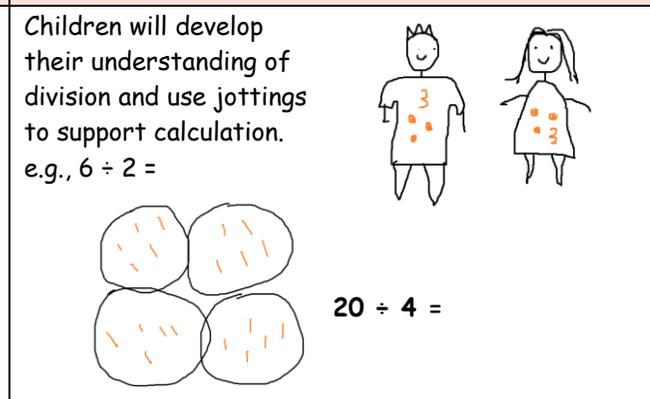
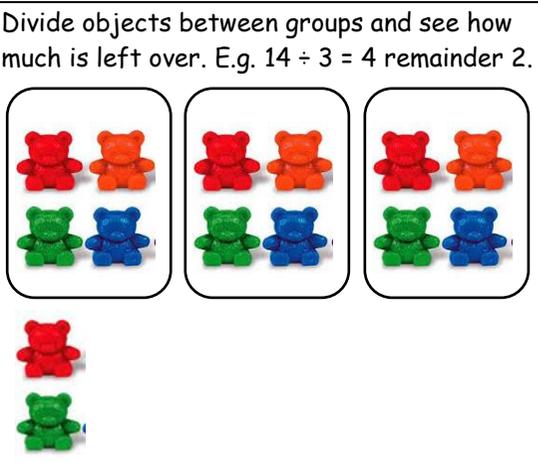
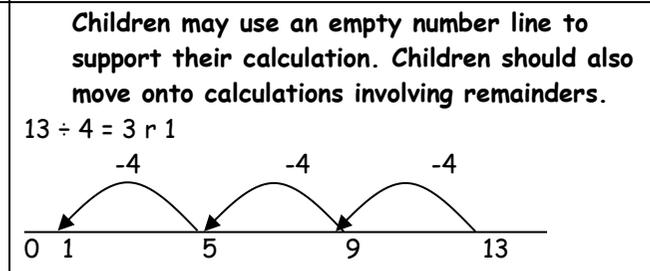
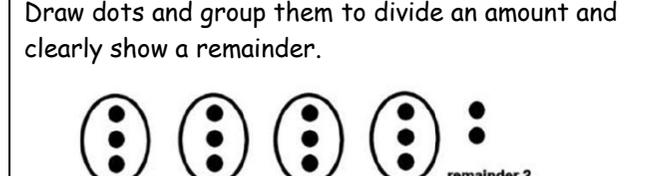
 124×26 becomes

$$\begin{array}{r} 1 \\ 1 \\ \times \\ \hline 7 4 \\ 4 0 \\ \hline 3 2 4 \\ \hline 1 \end{array}$$

Answer: 3224

Division		
Skill	Year	Representation and models
Solve one-step problems with division (sharing)	1/2	Bar model Real life objects Arrays Counters
Solve one-step problems with division (grouping)	1/2	Real life objects Number shapes Bead strings Counters Ten frames Number lines Arrays
Divide 2-digits by 1-digit (no exchange/regrouping - sharing structure)	3	Straws Base 10 Bar model Place value counters Part-whole model
Divide 2-digits by 1-digit (sharing with exchange/regrouping)	3	Straws Base 10 Bar model Place value counters Part-whole model
Divide 2-digits by 1-digit (sharing with remainders)	3/4	Straws Base 10 Bar model Place value counters Part-whole model
Divide 2-digits by 1-digit (grouping)	4/5	Place value counters Counters Place value grid Written short division
Divide 3-digits by 1-digit (sharing with exchange/regrouping)	4	Base 10 Bar model Place value counters Part-whole model
Divide 3-digits by 1-digit (grouping)	4/5	Place value counters Counters Place value grid Written short division
Divide 4-digits by 1-digit (grouping)	5	Place value counters Counters Place value grid Written short division
Divide multi-digits by 2-digits (short division)	6	Written short division List of multiples
Divide multi-digits by 2-digits (long division)	6	Written short division List of multiples

Division

	Concrete	Pictorial	Abstract
Sharing into groups	<p>Children will understand equal groups and share items out in play and problem solving.</p> <p>e.g., $6 \div 3 =$</p> 	<p>Children will develop their understanding of division and use jottings to support calculation.</p> <p>e.g., $6 \div 2 =$</p>  <p>$20 \div 4 =$</p>	<p>Share 9 buns between three people.</p> <p>$9 \div 3 = 3$</p> <p>Using symbols to stand for unknown numbers to complete equations using inverse operations</p> <p>$\square \div 2 = 4$ $20 \div \square = 4$ $\square \div \square = 4$</p>
Division with a remainder	<p>Divide objects between groups and see how much is left over. E.g. $14 \div 3 = 4$ remainder 2.</p> 	<p>Children may use an empty number line to support their calculation. Children should also move onto calculations involving remainders.</p> <p>$13 \div 4 = 3 \text{ r } 1$</p>  <p>Draw dots and group them to divide an amount and clearly show a remainder.</p>  <p>remainder 2</p>	<p>Complete written divisions and show the remainder using r.</p> <p>$32 \div 5 = 6 \text{ r } 2$</p>

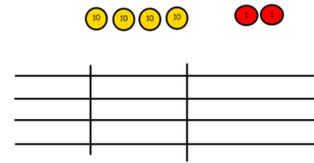
Short division

Use place value counters to divide using the bus stop method. Place the counters in the bus stop, partitioning the tens and ones. Then place them into groups. For example; $96 \div 3 = 3$ rows of 30 and 3 rows of 2.



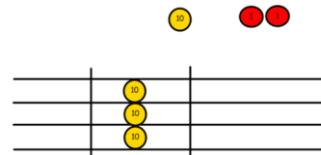
$$42 \div 3 =$$

Start with the biggest place value, we are sharing 40

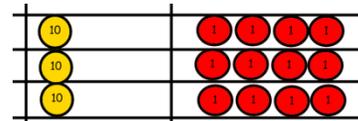


Calculations
 $42 \div 3$

into three groups. We can put 1 ten in each group and we have 1 ten left over.



We exchange this ten for ten ones and then share the ones equally among the groups.



We look how much in 1 group so the answer is 14.

Short and long division

Short division

98 ÷ 7 becomes

$$\begin{array}{r} 14 \\ 7 \overline{) 98} \\ \underline{7} \\ 28 \\ \underline{28} \\ 0 \end{array}$$

Answer: 14

432 ÷ 5 becomes

$$\begin{array}{r} 86 \text{ r } 2 \\ 5 \overline{) 432} \\ \underline{40} \\ 32 \\ \underline{30} \\ 2 \end{array}$$

Answer: 86 remainder 2

496 ÷ 11 becomes

$$\begin{array}{r} 45 \text{ r } 1 \\ 11 \overline{) 496} \\ \underline{44} \\ 56 \\ \underline{55} \\ 1 \end{array}$$

Answer: $45 \frac{1}{11}$

Long division

432 ÷ 15 becomes

$$\begin{array}{r} 28 \text{ r } 12 \\ 15 \overline{) 432} \\ \underline{30} \\ 132 \\ \underline{150} \\ 12 \end{array}$$

Answer: 28 remainder 12

432 ÷ 15 becomes

$$\begin{array}{r} 28 \\ 15 \overline{) 432} \\ \underline{30} \\ 132 \\ \underline{150} \\ 12 \end{array} \begin{array}{l} 15 \times 20 \\ 15 \times 8 \end{array}$$

$$\frac{12}{15} = \frac{4}{5}$$

Answer: $28 \frac{4}{5}$

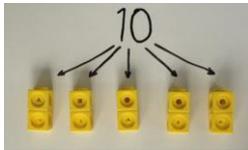
432 ÷ 15 becomes

$$\begin{array}{r} 28.8 \\ 15 \overline{) 432.0} \\ \underline{30} \\ 132 \\ \underline{150} \\ 120 \\ \underline{150} \\ 0 \end{array}$$

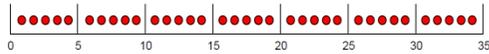
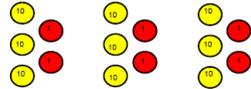
Answer: 28.8

Division as grouping

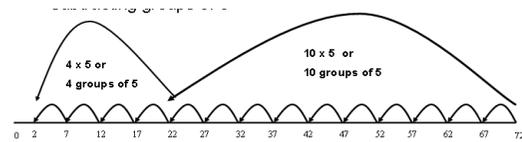
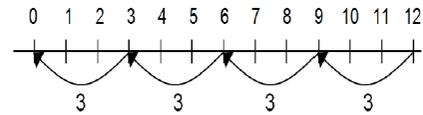
Divide quantities into equal groups.
Use cubes, counters, objects or place value counters to aid understanding.



$$96 \div 3 = 32$$



Use a number line to show jumps in groups. The number of jumps equals the number of groups (repeated subtraction).



For bar method, split it into the number of groups you are dividing by and work out how many would be within each group.

