

# **Harrow Lodge Primary School**



## **CALCULATION POLICY FOR MATHEMATICS**

**DUE FOR REVIEW:**

**Autumn 2023**

**RESPONSIBLE PERSON(S)**

**MRS J MATHARU**

This calculation policy sets out the methods used to help our pupils progress with calculations and have been devised to meet requirements of the National Curriculum 2014 for the teaching and learning of mathematics. The guidance is also designed to give pupils a consistent and smooth progression of learning in calculations across the school, adapted from White Rose Maths – Mastery Approach using \*Concrete, Pictorial and Abstract.

Pupils are taught strategies to develop and strengthen their mental agility on a daily basis. They also need to be able to apply written calculation skills in order to:

- represent work that has been done practically
- support, record and explain mental calculation
- keep track of steps in a longer task
- work out calculations that are too difficult to do mentally

The Calculation Policy shows methods that pupils will be taught within their respective year group. It is shown in teaching order. Children should be confident in choosing and using a strategy that they know will get them to the correct answer as efficiently as possible; pupils are free to choose their preferred method to solve calculations.

Pupils will leave us prepared for the next stage in their lives with:

- Quick recall of facts and procedures
- The flexibility and fluidity to move between different contexts and representations of mathematics
- The ability to recognise relationships and make connections in mathematics
- Confidence and belief that they can achieve
- The knowledge that Maths underpins most of our daily lives
- Skills and concepts that have been mastered
- Have a positive and inquisitive attitude to mathematics as an interesting and attractive subject in which all children gain success.

A mathematical concept or skill has been mastered when a child can show it in multiple ways, using the mathematical language to explain their ideas, and can independently apply the concept to new problems in unfamiliar situations and this is the goal for our children.

These will be assessed through: assessment, tracking, pupil progress meetings, performance management, moderation and standardisation.

#### \*Concrete, Pictorial, Abstract




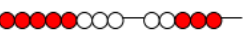






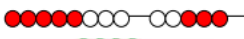




A key principle behind the Singapore Maths textbooks and Maths Mastery is based on the concrete, pictorial and abstract approach. Pupils are first introduced to an idea or skill by acting it out with real objects (a hands-on approach). Pupils then are moved onto the pictorial stage, where pupils are encouraged to relate the concrete understanding to pictorial representations. The final abstract stage is a change for pupils to represent problems using signs and symbols (for example – number sentences). Whilst this calculation policy aims to show the CPA approach to the different calculations, it is not always noted further up the year groups. However, it is expected that the CPA approach is used continuously in all new learning and calculations even when not noted.

## EYFS (Nursery and Reception)

In the statutory framework for EYFS, an Early Learning Goal is the standard children are expected to achieve by the end of their reception year. The ELG relevant to calculations is Number:

- Have a deep understanding of number to 10, including the composition of each number.
- Subitise (recognise quantities without counting) up to 5.
- Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some

Calculations will be taught in a purposeful, practical way and children will use play and exploration to acquire the relevant mathematical skills to solve them. A large majority of mathematical work is practical, and learning will happen in many different contexts around the classroom and outside e.g. small world play, role play, counters, cubes etc. They develop ways of recording calculations using pictures, etc. Some mathematical concepts relating to calculations will be teacher led and children can also freely explore these concepts through a variety of different activities and resources set up each day. Learning is repeated using different resources and representations to embed understanding.

Addition	Subtraction	Multiplication	Division
<p>Children are encouraged to gain a sense of the number system through the use of counting concrete objects.</p>  <p>They combine objects in practical ways and count all.</p>  <p>They understand addition as counting on and will count on in ones and twos using object s, cubes, bead string and number line.</p>   <p>They use concrete and pictorial representation to record their calculations.</p>  <p>They begin to use + and =</p>  <p>They are encouraged to develop a mental picture of the number system in their heads to use for calculations.</p>  <p>Higher attaining children may be able to represent their calculations using symbols and numbers within a written</p>	<p>Children are encouraged to gain a sense of the number system through the use of counting concrete objects.</p>  <p>They understand subtraction as counting out.</p>  <p>They begin to count back in ones and twos using objects, cubes, bead string and number line.</p>   <p>They use concrete and pictorial representation to record their calculations.</p> <p>They begin to use - and =</p> <p>They are encouraged to develop a mental picture of the number system in their heads to use for calculations.</p> <p>Higher attaining children may be able to represent their calculations using symbols and numbers within a written calculation.</p>	<p>Children use concrete objects to make and count equal groups of objects.</p>  <p>They will count on in twos using a bead string and number line.</p> <p>They understand doubling as repeated addition.</p> $2 + 2 = 4$ <p>They use concrete and pictorial representation to record their calculations. Higher attaining children may be able to represent their calculations using symbols and numbers within a written calculation.</p> 	<p>Children use concrete objects to count and share equally into 2 groups.</p> <p>6 cakes shared between 2 people each person gets 3 cakes. <math>6 \div 2 = 3</math></p>  <p>They count a set of objects and halve them by making two equal groups.</p> <p>They understand sharing and halving as dividing by 2.</p> <p>They will begin to use objects to make groups of 2 from a given amount.</p> <p>They use concrete and pictorial representation to record their calculations.</p>  <p>Higher attaining children may be able to represent their calculations using symbols and numbers within a written calculation.</p>

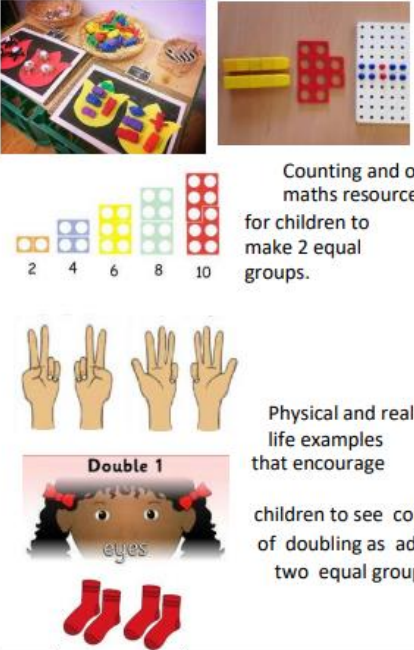
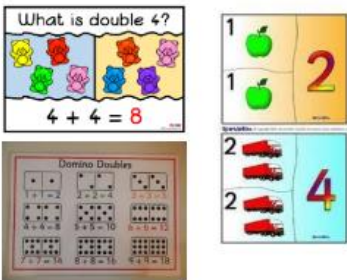
### Addition- EYFS

Objectives	Concrete	Pictorial	Abstract												
<p>Knows that a group of things change in quantity when something is added.</p> <p>Find the total number of items in two groups by counting all of them.</p> <p>Says the number that is one more than a given number.</p> <p>Finds one more from a group of up to five objects, then ten objects.</p> <p>In practical activities and discussion, beginning to use the vocabulary involved in adding.</p> <p>Using quantities and objects, they add two single digit numbers and count on to find the answer.</p> <p>Solve problems including doubling.</p>	<p>Use toys and general classroom resources for children to physically manipulate, group/regroup.</p> <p>Use specific maths resources such as counters, snap cubes, Numicon etc.</p> <p>Use visual supports such as ten frames, part part whole and addition mats, with the physical objects and resources that can be manipulated.</p>	<p>Two groups of pictures so children are able to count the total.</p> <p>Bar model using visuals, pictures/icons or colours.</p> <p>Use visual supports such as ten frames, part part whole and addition mats with pictures/icons.</p>	<p>A focus on symbols and numbers to form a calculation.</p> <p style="font-size: 2em; font-weight: bold; border: 1px solid black; padding: 5px; display: inline-block;"><math>5 + 2 = 7</math></p> <div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center; margin-right: 10px;"> <p>5 whole</p> </div> <div style="text-align: center;"> <p>3 part</p> <p>2 part</p> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>2</td><td>2</td></tr> <tr><td>5</td><td>5</td></tr> </table> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>3</td><td>5</td></tr> <tr><td>3</td><td>3</td></tr> </table> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>5</td><td>5</td></tr> <tr><td>6</td><td>6</td></tr> </table> </div> <p>No expectation for children to be able to record a number sentence/addition calculation.</p>	2	2	5	5	3	5	3	3	5	5	6	6
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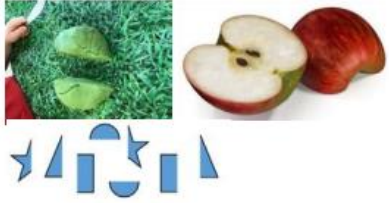
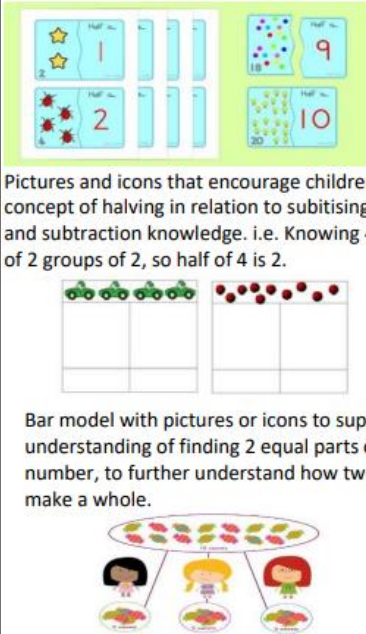
### Subtraction- EYFS


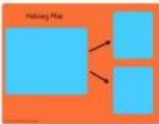

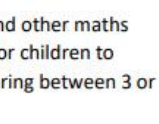
Objectives	Concrete	Pictorial	Abstract				
<p>Knows that a group of things change in quantity when something is taken away</p> <p>Find one less from a group of five objects, then ten objects.</p> <p>In practical activities and discussion, beginning to use the vocabulary involved in subtracting.</p> <p>Using quantities and objects, they subtract two single digit numbers and count back to find the answer.</p>	<p>Use toys and general classroom resources for children to physically manipulate, group/regroup.</p> <p>Use specific maths resources such as snap cubes, Numicon, bead strings etc.</p> <p>Use visual supports such as ten frames, part part whole and subtraction mats, with the physical objects and resources that can be manipulated.</p>	<p>A group of pictures for children to cross out or cover quantities to support subtraction.</p> <p>Use visual supports such as ten frames, part part whole and bar model with pictures/icons.</p>	<p>A focus on symbols and numbers to form a calculation.</p> <p style="font-size: 1.5em; font-weight: bold; border: 1px solid black; padding: 5px; display: inline-block;"><math>10 - 6 = 4</math></p> <div style="display: flex; align-items: center; justify-content: center; margin-top: 10px;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>3</td><td>?</td></tr> <tr><td colspan="2">7</td></tr> </table> <div style="margin: 0 20px;"> <p><math>7 - 3 = ?</math></p> </div> <div style="text-align: center;"> <p>7</p> <p>3</p> <p>?</p> </div> </div> <p>* No expectation for children to be able to record a number sentence/addition calculation.</p>	3	?	7	
3	?						
7							

Multiplication-EYFS

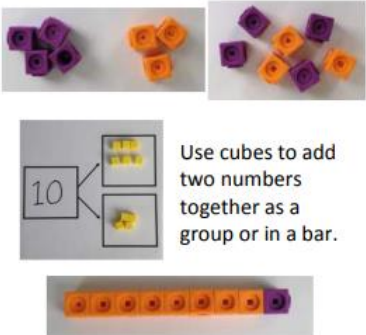
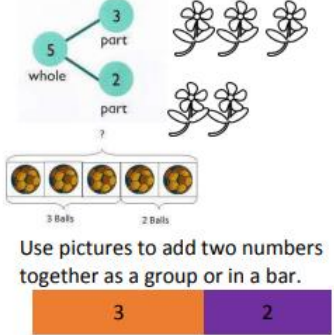
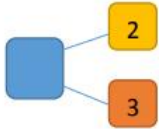
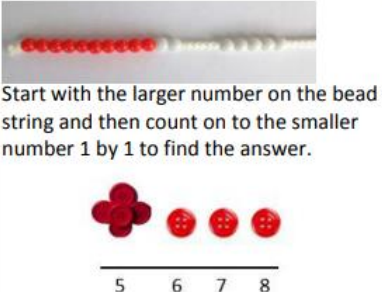

Objectives	Concrete	Pictorial	Abstract												
Solve problems including doubling	 <p>Counting and other maths resources for children to make 2 equal groups.</p> <p>Physical and real life examples that encourage children to see concept of doubling as adding two equal groups.</p>	 <p>Pictures and icons that encourage children to see concept of doubling as adding two equal groups.</p>	<table border="1" data-bbox="1248 215 1426 398"> <tr><td>1+1=</td><td>7+7=</td></tr> <tr><td>2+2=</td><td>8+8=</td></tr> <tr><td>3+3=</td><td>9+9=</td></tr> <tr><td>4+4=</td><td>10+10=</td></tr> <tr><td>5+5=</td><td>11+11=</td></tr> <tr><td>6+6=</td><td>12+12=</td></tr> </table> <p>Addition calculations to model adding two equal groups.</p>	1+1=	7+7=	2+2=	8+8=	3+3=	9+9=	4+4=	10+10=	5+5=	11+11=	6+6=	12+12=
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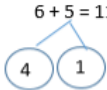
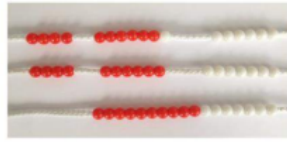
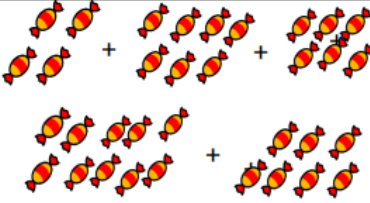
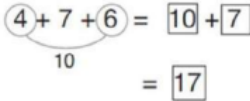
Division- EYFS

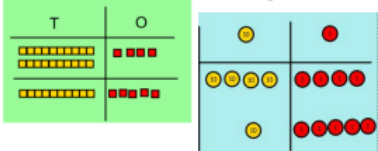
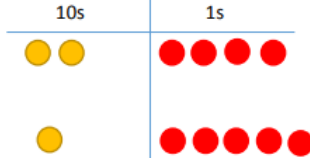
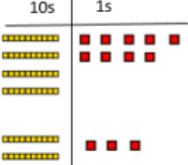
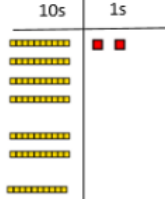
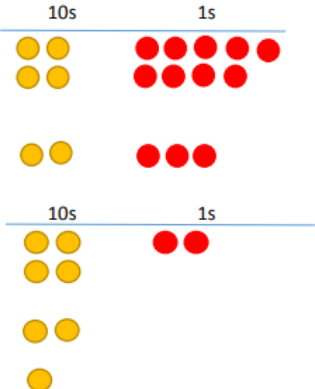
Objectives	Concrete	Pictorial	Abstract
<p>Solve problems including halving and sharing.</p> <p>Halving a whole, halving a quantity of objects.</p> <p>Sharing a quantity of objects.</p>	 <p>Children have the opportunity to physically cut objects, food or shapes in half.</p>	 <p>Pictures and icons that encourage children to see concept of halving in relation to subitising, addition and subtraction knowledge. i.e. Knowing 4 is made of 2 groups of 2, so half of 4 is 2.</p> <p>Bar model with pictures or icons to support understanding of finding 2 equal parts of a number, to further understand how two halves make a whole.</p> <p>Pictures for children to create and visualise 3 or more</p>	

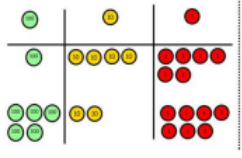
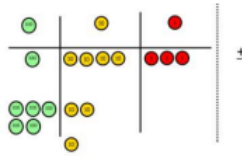
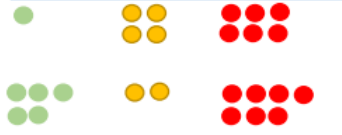
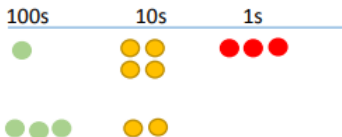
	 <p>Use visual supports such as halving mats and part part whole with the physical objects and resources that can be manipulated</p>   <p>Counting and other maths resources for children to explore sharing between 3 or more</p>  <p>Counting and other maths resources for children to share into two equal groups.</p>		
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Calculation Guidance: Addition

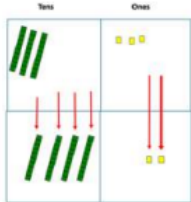

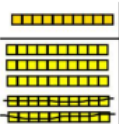
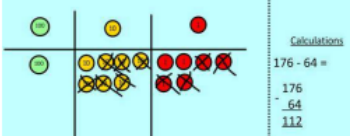
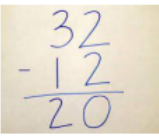
	Objective	Concrete	Pictorial	Abstract
Year 1	Number bonds of 5, 6, 7, 8, 9 and 10	 <p>Use cubes to add two numbers together as a group or in a bar.</p>	 <p>Use pictures to add two numbers together as a group or in a bar.</p>	$2 + 3 = 5$ $3 + 2 = 5$ $5 = 3 + 2$ $5 = 2 + 3$  <p>Use the part-part-whole diagram as shown above to move into the abstract.</p>
	Counting	 <p>Start with the larger number on the bead string and then count on to the smaller number 1 by 1 to find the answer.</p>	Use a number line to count on in ones. 	$5 + 3 = 8$

	Objective	Concrete	Pictorial	Abstract
Year 1	Regrouping to make 10	  $6 + 5 = 11$ Start with the bigger number and use the smaller number to make 10.	 $6 + 5 = 11$  $6 + 4 = 10$ $10 + 1 = 11$	$6 + 5 = 11$
Year 2	Adding 3 single digit numbers	$4 + 7 + 6 = 17$ Put 4 and 6 together to make 10. Add on 7.  Following on from making 10, make 10 with 2 of the digits (if possible) then add on the third digit.	 Add together three groups of objects. Draw a picture to recombine the groups to make 10.	 Combine the two numbers that make 10 and then add on the remainder.




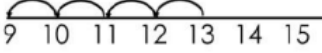
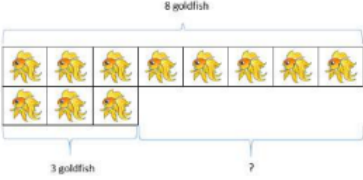
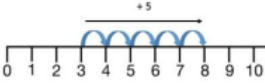
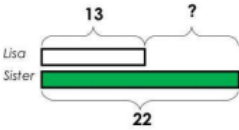
	Objective	Concrete	Pictorial	Abstract
Year 2	Column method without regrouping	Add together the ones first, then add the tens. Use the Base 10 blocks first before moving onto place value counters. $24 + 15 =$ 	After physically using the base 10 blocks and place value counters, children can draw the counters to help them to solve additions. 	$24 + 15 = 39$ $\begin{array}{r} 24 \\ + 15 \\ \hline 39 \end{array}$
	Column method with regrouping	Make both numbers on a place value grid.  Add up the units and exchange 10 ones for 1 ten. 	Using place value counters, children can draw the counters to help them to solve additions. 	$40 + 9$ $\underline{20 + 3}$ $60 + 12 = 72$

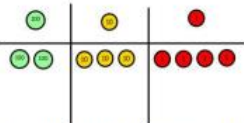
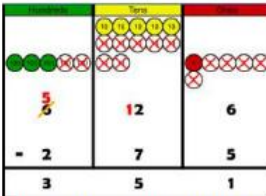

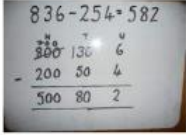
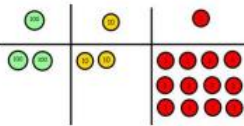
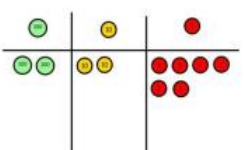

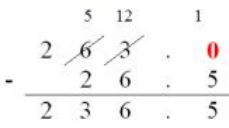
	Objective	Concrete	Pictorial	Abstract
Year 3/4	Column method with regrouping	<p>Make both numbers on a place value grid.</p>  <p>146 + 527</p> <p>Add up the units and exchange 10 ones for 1 ten.</p>  <p>146 + 527</p> <p>As children move on to decimals, money and decimal place value counters can be used to support learning.</p> <p><b>NB</b> By Year 4 children will progress on to adding four digit numbers.</p>	<p>100s      10s      1s</p>  <p>100s      10s      1s</p>  <p>Children can draw a pictorial representation of the columns and place value counters to further support their learning and understanding.</p> <p><b>NB</b> Addition of money needs to have £ and p added separately.</p>	<p><math>100 + 40 + 6</math> <math>500 + 20 + 7</math> <math>600 + 70 + 3 = 673</math></p> <p>As the children progress, they will move from the expanded to the compacted method.</p> <p>146 + 527 673</p> <p>1</p> <p>As the children move on, introduce decimals with the same number of decimal places and different. Money can be used here.</p>
Year 5/6	Column method with regrouping	Consolidate understanding using numbers with more than 4 digits and extend by adding numbers with up to 3 decimal places.		

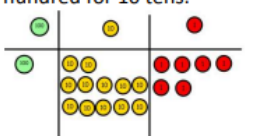
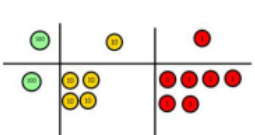
### Calculation Guidance: Subtraction

	Objective	Concrete	Pictorial	Abstract
Year 2	Column method without regrouping	<p><math>75 - 42 = 33</math></p>  <p>Use Base 10 to make the bigger number then take the smaller number away.</p> <p>Show how you partition numbers to subtract.</p>  <p>Again make the larger number first.</p>	 <p>Calculations</p> $\begin{array}{r} 54 \\ - 22 \\ \hline 32 \end{array}$ <p>Draw the Base 10 or place value counters alongside the written calculation to help to show working.</p>  <p>Calculations</p> $\begin{array}{r} 176 \\ - 64 \\ \hline 112 \end{array}$	<p><math>47 - 24 = 23</math></p> $\begin{array}{r} 40 + 7 \\ - 20 + 4 \\ \hline 20 + 3 \end{array}$ <p>This will lead to a clear written column subtraction.</p> 

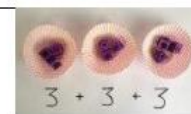



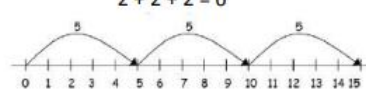









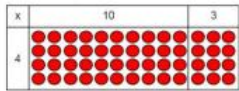
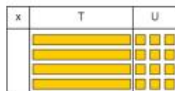

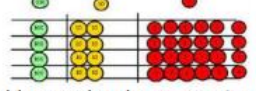

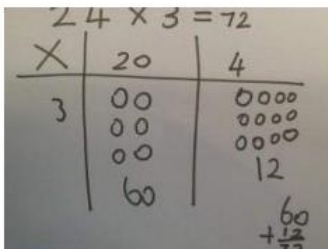
	Objective	Concrete	Pictorial	Abstract
Year 1	Taking away ones	Use physical objects, counters, cubes etc. to show how objects can be taken away. $4 - 2 = 2$ 	Cross out drawn objects to show what has been taken away. $4 - 2 = 2$ 	$4 - 2 = 2$
	Counting back	Make the larger number in your subtraction. Move the beads along your bead string as you count backwards in ones.  $13 - 4 = 9$	Count back on a number line or number track  Start at the bigger number and count back the smaller number, showing the jumps on the number line.	Put 13 in your head, count back 4. What number are you at? Use your fingers to help.
	Find 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.	Count on to find the difference.  Lisa is 13 years old. Her sister is 22 years old. Find the difference in age between them.  Draw bars to find the difference between 2 numbers.	Hannah has 8 goldfish. Helen has 3 goldfish. Find the difference between the number of goldfish the girls have.

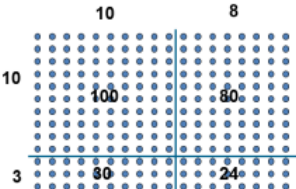
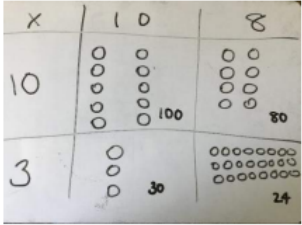
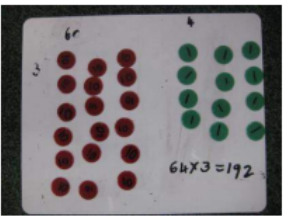
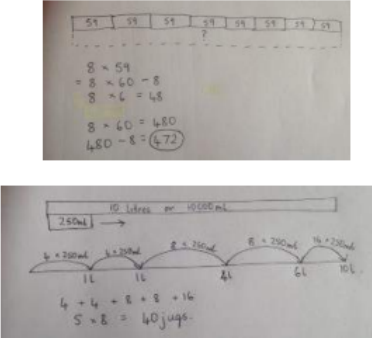
	Objective	Concrete	Pictorial	Abstract
Year 3 onwards	Column method with regrouping	Use Base 10 to start with before moving on to place value counters. Start with one exchange before moving onto subtractions with 2 exchanges. Make the larger number with the place value counters  Calculations $234 - 88$	 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. 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. 	 Children can start their formal written method by partitioning the number into clear place value columns.
		Start with the ones, can I take away 8 from 4 easily? I need to exchange 1 of my tens for 10 ones.  Calculations $234 - 88$ Now I can subtract my ones.  Calculations $234 - 88$ Moving forward the children use a more compact method. This will lead to an understanding of subtracting any number including decimals.  		

	Objective	Concrete	Pictorial	Abstract
Year 3 up	Column method with regrouping	<p>Now look at the tens, can I take away 8 tens easily? I need to exchange 1 hundred for 10 tens.</p>  <p>Calculations  <math display="block">\begin{array}{r} 234 \\ - 88 \\ \hline \end{array}</math></p> <p>Now I can take away 8 tens and complete my subtraction.</p>  <p>Calculations  <math display="block">\begin{array}{r} 234 \\ - 88 \\ \hline 146 \end{array}</math></p> <p>Show children how the concrete method links to the written method alongside your working. Cross out the numbers when exchanging and show where we write our new amount.</p>		

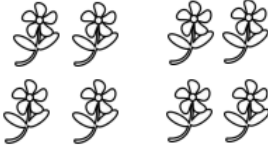
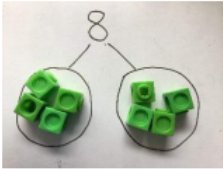
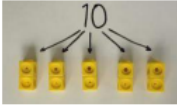
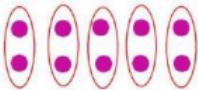
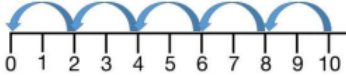
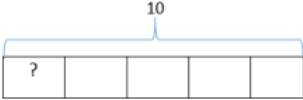
### Calculation Guidance: Multiplication


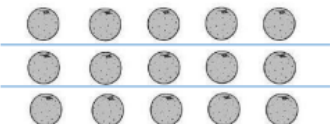
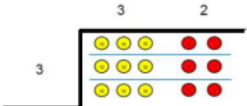
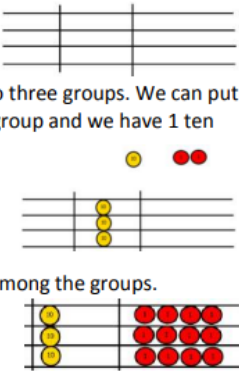
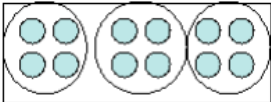
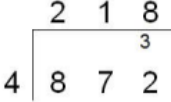
	Objective	Concrete	Pictorial	Abstract
Year 1/2	Repeated addition	 $3 + 3 + 3$   <p>Use different objects to add equal groups.</p>	<p>There are 3 plates. Each plate has 2 star biscuits on. How many biscuits are there?</p>  $2 + 2 + 2 = 6$  $5 + 5 + 5 = 15$	<p>Write addition sentences to describe objects and pictures.</p>  $2 + 2 + 2 = 6$
	Arrays - showing commutative multiplication	<p>Create arrays using counters/cubes to show multiplication sentences.</p>  	<p>Draw arrays in different rotations to find <b>commutative</b> multiplication sentences.</p>  $4 \times 2 = 8$ $2 \times 4 = 8$  $2 \times 4 = 8$ $4 \times 2 = 8$ <p>Link arrays to area of rectangles.</p> 	<p>Use an array to write multiplication sentences and reinforce repeated addition.</p>  $5 + 5 + 5 = 15$ $3 + 3 + 3 + 3 + 3 = 15$ $5 \times 3 = 15$ $3 \times 5 = 15$

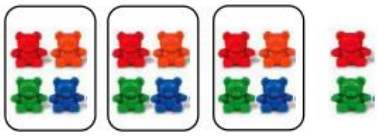



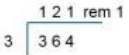
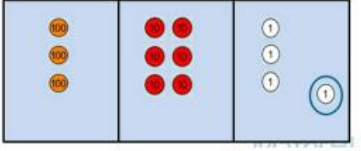
	Objective	Concrete	Pictorial	Abstract																														
Year 3/4	Grid method	<p>Show the link with arrays to first introduce the grid method.</p>  <p>4 rows of 10 4 rows of 3</p> <p>Move on to using Base 10 to move towards a more compact method.</p>  <p>4 rows of 13</p> <p>Move on to place value counters to show how we are finding groups of a number. We are multiplying by 4 so we need 4 rows.</p>  <p>Fill each row with 126.</p>  <p>4 x 126</p> <p>Add up each column, starting with the ones making any exchanges needed.</p>  <p>4 x 126 = 504</p>	<p>Children can represent the work they have done with place value counters in a way that they understand.</p> <p>They can draw the counters, using colours to show different amounts or just use circles in the different columns to show their thinking as shown below.</p> 	<p>Start with multiplying by one digit numbers and showing the clear addition alongside the grid.</p> <table border="1" data-bbox="1104 264 1343 331"> <tr> <td>x</td> <td>30</td> <td>5</td> </tr> <tr> <td>7</td> <td>210</td> <td>35</td> </tr> </table> <p>210 + 35 = 245</p> <p>Moving forward, multiply by a 2 digit number showing the different rows within the grid method.</p> <table border="1" data-bbox="1168 510 1391 654"> <tr> <td></td> <td>10</td> <td>8</td> </tr> <tr> <td>10</td> <td>100</td> <td>80</td> </tr> <tr> <td>3</td> <td>30</td> <td>24</td> </tr> </table> <table border="1" data-bbox="1104 698 1407 846"> <tr> <td>x</td> <td>1000</td> <td>300</td> <td>40</td> <td>2</td> </tr> <tr> <td>10</td> <td>10000</td> <td>3000</td> <td>400</td> <td>20</td> </tr> <tr> <td>8</td> <td>8000</td> <td>2400</td> <td>320</td> <td>16</td> </tr> </table>	x	30	5	7	210	35		10	8	10	100	80	3	30	24	x	1000	300	40	2	10	10000	3000	400	20	8	8000	2400	320	16
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	Objective	Concrete	Pictorial	Abstract																											
	Expanded method	<p>Show the link with arrays to first introduce the expanded method.</p> 		<p>Start with long multiplication, reminding the children about lining up their numbers clearly in columns.</p> $\begin{array}{r} 18 \\ \times 13 \\ \hline 54 \\ 180 \\ \hline 234 \end{array}$ <p>24 (3 x 8) 30 (3 x 10) 80 (10 x 8) 100 (10 x 10) 234</p>																											
Year 5/6	Compact method	<p>Children can continue to be supported by place value counters at the stage of multiplication.</p>  <p>It is important at this stage that they always multiply the ones first and note down their answer followed by the tens which they note below.</p>	<p>Bar modelling and number lines can support learners when solving problems with multiplication alongside the formal written methods.</p> 	<p>Start with long multiplication, reminding the children about lining up their numbers clearly in columns.</p> <p>If it helps, children can write out what they are solving next to their answer.</p> <table border="1" data-bbox="1193 1460 1353 1675"> <tr> <td></td> <td>7</td> <td>4</td> </tr> <tr> <td>x</td> <td>6</td> <td>3</td> </tr> <tr> <td></td> <td>1</td> <td>2</td> </tr> <tr> <td></td> <td>2</td> <td>1</td> <td>0</td> </tr> <tr> <td></td> <td>2</td> <td>4</td> <td>0</td> </tr> <tr> <td>+</td> <td>4</td> <td>2</td> <td>0</td> <td>0</td> </tr> <tr> <td></td> <td>4</td> <td>6</td> <td>6</td> <td>2</td> </tr> </table> <p>This moves to the more compact method.</p> $\begin{array}{r} 1342 \\ \times 18 \\ \hline 10736 \\ 13420 \\ \hline 24156 \end{array}$		7	4	x	6	3		1	2		2	1	0		2	4	0	+	4	2	0	0		4	6	6	2
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## Calculation Guidance: Division

	Objective	Concrete	Pictorial	Abstract
Year 1/2	Sharing	I have 8 cubes, can you share them equally between two people?	Children use pictures or shapes to share quantities.  $8 \div 2 = 4$	Share 8 buns between two people. $8 \div 2 = 4$ 
	Grouping	Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding.  	Use a number line to show jumps in groups. The number of jumps equals the number of groups.  Think of the bar as a whole. Split it into the number of groups you are dividing by and work out how many would be within each group.  $10 \div 5 = ?$ $5 \times ? = 10$	$10 \div 5 = 2$ Divide 10 into 5 groups. How many are in each group?

	Objective	Concrete	Pictorial	Abstract
Year 3/4	Division with arrays	Link division to multiplication by creating an array and thinking about the number sentences that can be created. Eg $15 \div 3 = 5$ $5 \times 3 = 15$ $15 \div 5 = 3$ $3 \times 5 = 15$ 	 Draw an array and use lines to split the array into groups to make multiplication and division sentences.	Find the inverse of multiplication and division sentences by creating four linking number sentences. $5 \times 3 = 15$ $3 \times 5 = 15$ $15 \div 5 = 3$ $15 \div 3 = 5$
	Short division	Use place value counters to divide using the short division method alongside. $96 \div 3$  $42 \div 3$ Start with the biggest place value. We are sharing 40 into three groups. We can put 1 ten in each group and we have 1 ten left over. We exchange this ten for 10 ones and then share the ones equally among the groups. We look at how many are in each group. 	Students can continue to use drawn diagrams with dots or circles to help them divide numbers into equal groups.  Encourage them to move towards counting in multiples to divide more efficiently.	Begin with divisions that divide equally with no remainder. 

	Objective	Concrete	Pictorial	Abstract
Year 5/6	Division with remainders	$14 \div 3 =$ Divide objects between groups and see how much is left over 	Jump forward in equal jumps on a number line then see how many more you need to jump to find a remainder.  Draw dots and group them to divide an amount and clearly show a remainder. 	Complete written divisions and show the remainder using r. $29 \div 8 = 3 \text{ REMAINDER } 5$ <small>dividend divisor quotient remainder</small> 
	Short division with remainders	$364 \div 3 =$  		Move onto divisions with a remainder. Once children understand remainders, begin to express as a fraction or decimal according to the context. $\begin{array}{r} 86 \text{ r } 2 \\ 3 \overline{) 258} \\ \underline{24} \phantom{0} \\ 18 \phantom{0} \\ \underline{18} \phantom{0} \\ 0 \end{array}$ $\begin{array}{r} 186 \frac{1}{5} \\ 5 \overline{) 931} \\ \underline{50} \phantom{0} \\ 43 \phantom{0} \\ \underline{40} \phantom{0} \\ 31 \\ \underline{30} \\ 1 \end{array}$ $\begin{array}{r} 14.6 \\ 35 \overline{) 511.0} \\ \underline{35} \phantom{0} \\ 16 \phantom{0} \\ \underline{14} \phantom{0} \\ 21 \\ \underline{21} \\ 0 \end{array}$

	Objective	Concrete	Pictorial	Abstract
Year 6	Long division			Children will use long division to divide numbers with up to 4 digits by 2 digit numbers. $\begin{array}{r} 015 \\ 32 \overline{) 487} \\ \underline{-0} \phantom{0} \\ 48 \\ \underline{-32} \\ 167 \\ \underline{-160} \\ 7 \end{array}$ $\begin{array}{r} 17 \text{ r } 19 \\ 31 \overline{) 546} \\ \underline{31} \phantom{0} \\ 236 \\ \underline{217} \\ 19 \end{array}$