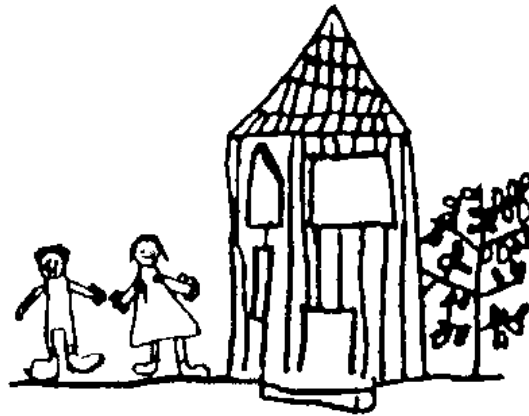




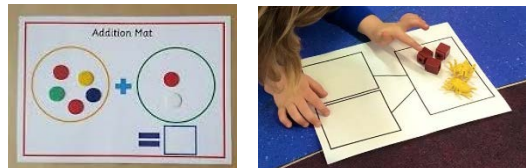

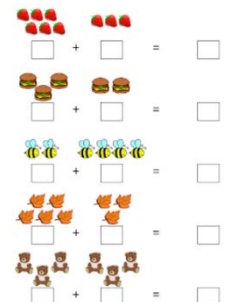
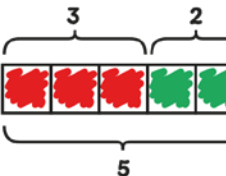
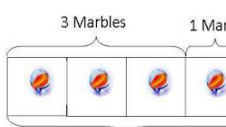
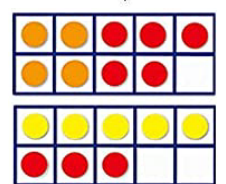
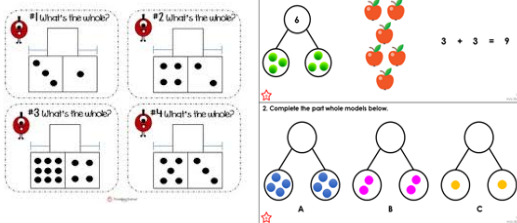
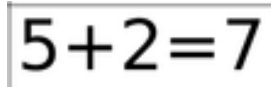
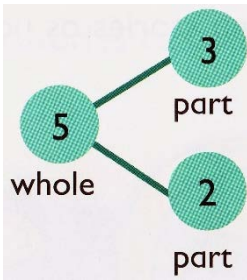
# Broomhill Infant School



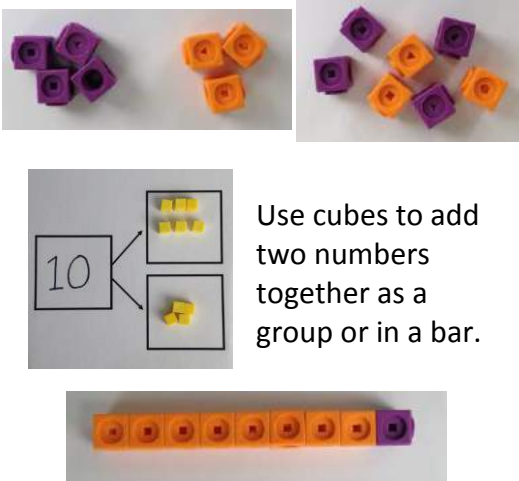
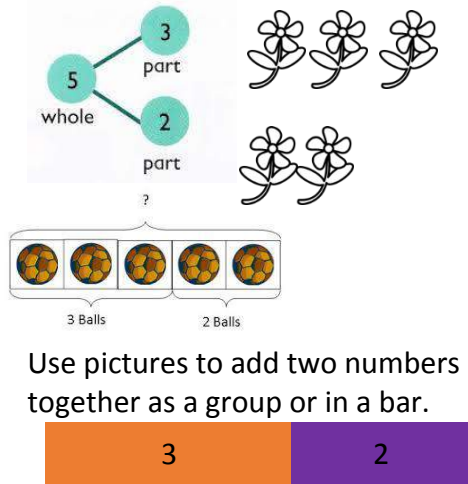
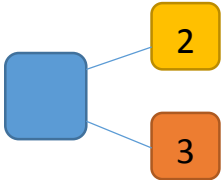
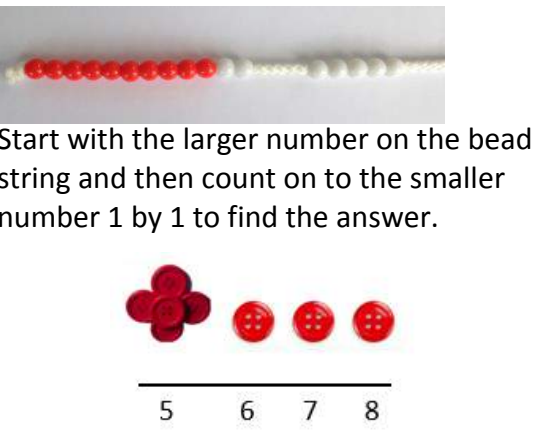

## Calculation Policy

This policy has largely been adapted from the White Rose Maths Hub calculation policy with additional material added. It is a working document and will be revised and amended as necessary

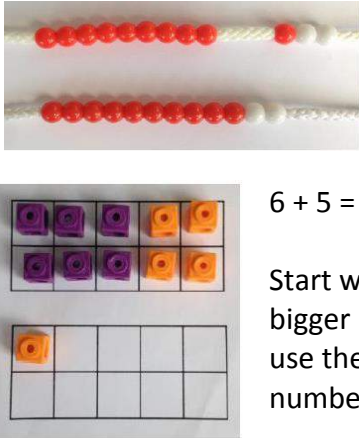
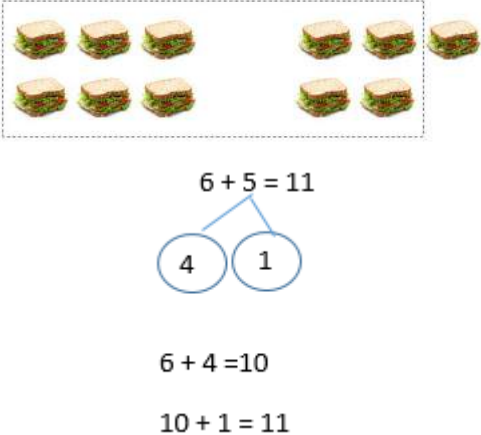

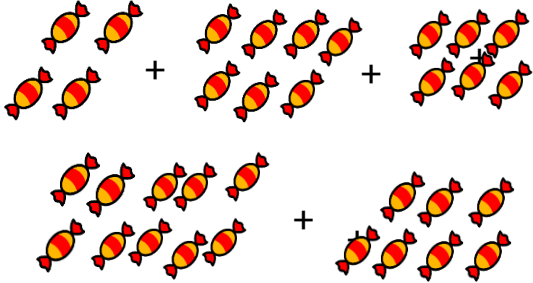
## Addition- EYFS

Objectives	Concrete	Pictorial	Abstract																																
<ul style="list-style-type: none"> <li>- Knows that a group of things change in quantity when something is added.</li> <li>- Find the total number of items in two groups by counting all of them.</li> <li>- Says the number that is one more than a given number.</li> <li>- Finds one more from a group of up to five objects, then ten objects.</li> <li>- In practical activities and discussion, beginning to use the vocabulary involved in adding.</li> <li>- Using quantities and objects, they add two single digit numbers and count on to find the answer.</li> <li>- Solve problems including doubling.</li> </ul>	<div style="text-align: center;">  <p>Use toys and general classroom resources for children to physically manipulate, group/regroup.</p> </div> <div style="text-align: center;">  <p>Use specific maths resources such as counters, snap cubes, Numicon etc.</p> </div> <div style="text-align: center;">  <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> </div> <div style="text-align: center;">  </div>	<div style="text-align: center;">  <p>Two groups of pictures so children are able to count the total.</p> </div> <div style="text-align: center;">  <p>Bar model using visuals, pictures/icons or colours.</p> </div> <div style="text-align: center;">  <p>3 Marbles 1 Marble</p> </div> <div style="text-align: center;">  <p>Use visual supports such as ten frames, part part whole and addition mats with pictures/icons.</p> </div> <div style="text-align: center;">  <p>1. Circle the odd one out. 2. Complete the part whole models below.</p> </div>	<p style="text-align: center;">A focus on symbols and numbers to form a calculation.</p> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> <div style="text-align: center;"> <table border="1" style="margin: 5px;"> <tr><td> </td><td> </td></tr> <tr><td>2</td><td>3</td></tr> </table> <table border="1" style="margin: 5px;"> <tr><td> </td><td> </td></tr> <tr><td>4</td><td>5</td></tr> </table> <table border="1" style="margin: 5px;"> <tr><td> </td><td> </td></tr> <tr><td>5</td><td>4</td></tr> <tr><td> </td><td> </td></tr> </table> <table border="1" style="margin: 5px;"> <tr><td> </td><td> </td></tr> <tr><td>3</td><td>3</td></tr> <tr><td> </td><td> </td></tr> </table> <table border="1" style="margin: 5px;"> <tr><td> </td><td> </td></tr> <tr><td>5</td><td>5</td></tr> <tr><td> </td><td> </td></tr> </table> <table border="1" style="margin: 5px;"> <tr><td> </td><td> </td></tr> <tr><td>6</td><td> </td></tr> <tr><td>4</td><td> </td></tr> </table> </div> <p style="text-align: center;">* No expectation for children to be able to record a number sentence/addition calculation.</p>			2	3			4	5			5	4					3	3					5	5					6		4	
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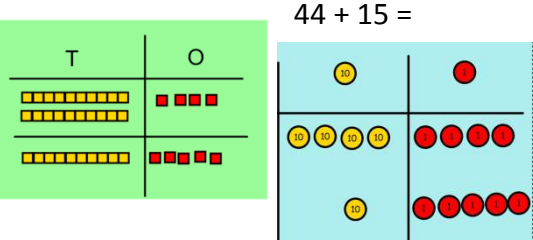
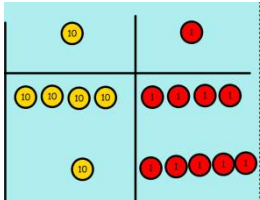
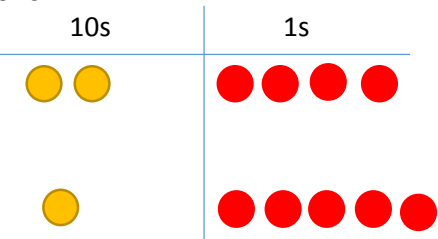
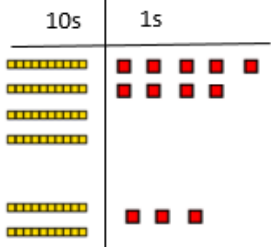
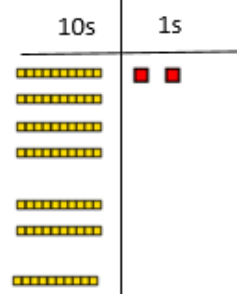
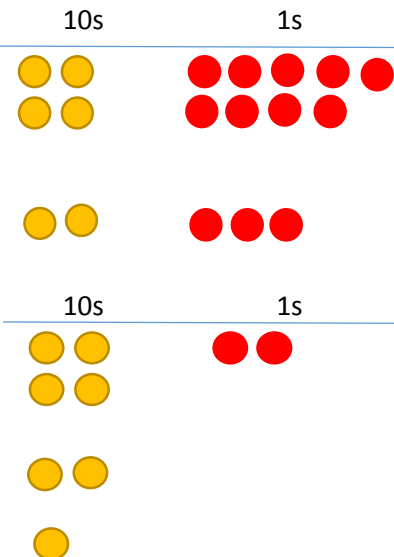
# CALCULATION GUIDANCE: Addition

	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>	<p>Use a number line to count on in ones.</p> 	$5 + 3 = 8$


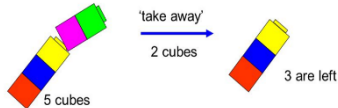
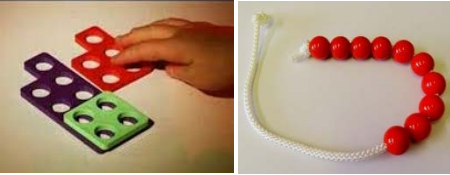
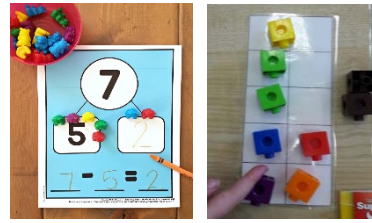
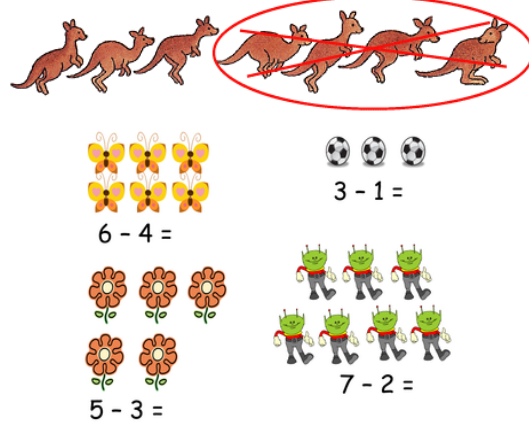
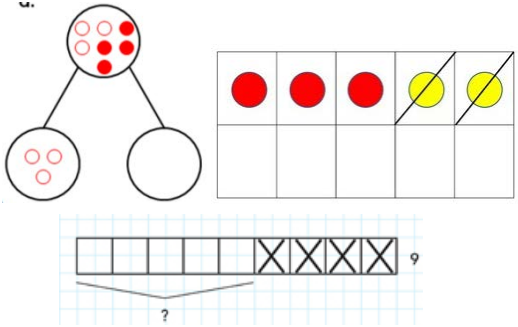

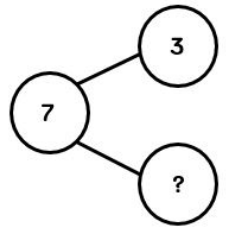
# CALCULATION GUIDANCE: Addition

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

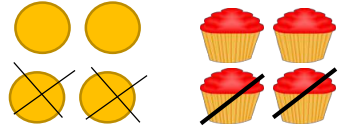
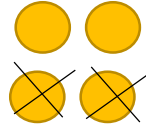

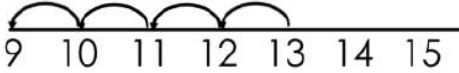
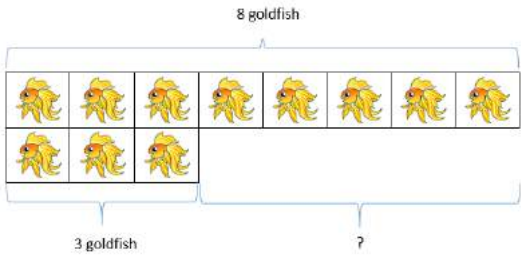
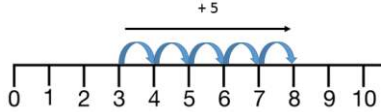
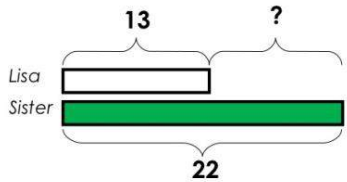
# CALCULATION GUIDANCE: Addition

	Objective	Concrete	Pictorial	Abstract
Year 2	Column method without regrouping	<p>Add together the ones first, then add the tens. Use the Base 10 blocks first before moving onto place value counters.</p> <p><math>24 + 15 =</math></p>  <p><math>44 + 15 =</math></p> 	<p>After physically using the base 10 blocks and place value counters, children can draw the counters to help them to solve additions.</p> 	<p><math>24 + 15 = 39</math></p> $\begin{array}{r} 24 \\ + 15 \\ \hline 39 \end{array}$
	Column method with regrouping	<p>Make both numbers on a place value grid.</p>  <p>Add up the units and exchange 10 ones for 1 ten.</p> 	<p>Using place value counters, children can draw the counters to help them to solve additions.</p> 	<p><math>40 + 9</math></p> $\begin{array}{r} 40 \\ + 9 \\ \hline 49 \end{array}$ <p><math>20 + 3</math></p> $\begin{array}{r} 20 \\ + 3 \\ \hline 23 \end{array}$ <p><math>60 + 12 = 72</math></p>

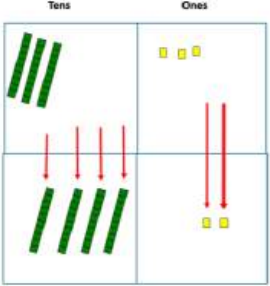
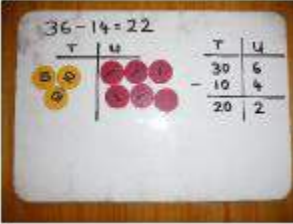
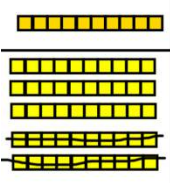
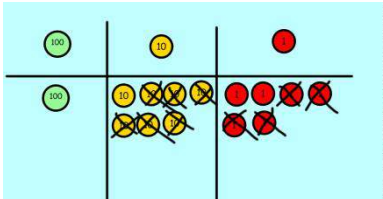
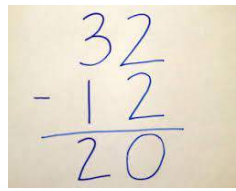
## Subtraction- EYFS

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>	<div style="text-align: center;">  <p>Use toys and general classroom resources for children to physically manipulate, group/regroup.</p> </div> <div style="text-align: center;">  <p>5 cubes      take away 2 cubes      3 are left</p> </div> <div style="text-align: center;">  <p>Use specific maths resources such as snap cubes, Numicon, bead strings etc.</p> </div> <div style="text-align: center;">  <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> </div>	<div style="text-align: center;">  <p>6 - 4 =      3 - 1 =</p> <p>5 - 3 =      7 - 2 =</p> <p>A group of pictures for children to cross out or cover quantities to support subtraction.</p> </div> <div style="text-align: center;">  <p>Use visual supports such as ten frames, part part whole and bar model with pictures/icons.</p> </div>	<p style="text-align: center;">A focus on symbols and numbers to form a calculation.</p> <div style="text-align: center;">  <p style="font-size: 24px; font-weight: bold; border: 2px solid blue; padding: 5px; display: inline-block;">10 - 6 = 4</p> </div> <div style="text-align: center; margin-top: 20px;"> <table border="1" style="border-collapse: collapse; width: 150px; height: 60px;"> <tr> <td style="width: 50px; text-align: center;">3</td> <td style="width: 50px; text-align: center;">?</td> </tr> <tr> <td colspan="2" style="text-align: center; height: 30px;">7</td> </tr> </table> <p style="font-size: 24px; font-weight: bold;">7 - 3 = ?</p>  </div> <p style="text-align: center; font-size: 12px;">* No expectation for children to be able to record a number sentence/addition calculation.</p>	3	?	7	
3	?						
7							

# CALCULATION GUIDANCE: Subtraction

	Objective	Concrete	Pictorial	Abstract
Year 1	Taking away ones	<p>Use physical objects, counters, cubes etc. to show how objects can be taken away.</p> <p><math>4 - 2 = 2</math></p> 	<p>Cross out drawn objects to show what has been taken away.</p> <p><math>4 - 2 = 2</math></p> 	$4 - 2 = 2$
	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><math>13 - 4 = 9</math></p>	<p>Count back on a number line or number track</p>  <p>Start at the bigger number and count back the smaller number, showing the jumps on the number line.</p>	<p>Put 13 in your head, count back 4. What number are you at? Use your fingers to help.</p>
	Find the difference	<p>Compare amounts and objects to find the difference.</p>  <p>Use cubes to build towers or make bars to find the difference. Use basic bar models with items to find the difference.</p>	 <p>Count on to find the difference.</p> <p>Lisa is 13 years old. Her sister is 22 years old. Find the difference in age between them.</p>  <p>Draw bars to find the difference between 2 numbers.</p>	<p>Hannah has 8 goldfish. Helen has 3 goldfish. Find the difference between the number of goldfish the girls have.</p>

# 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> 

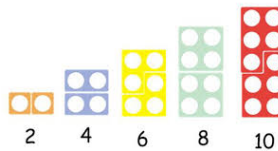
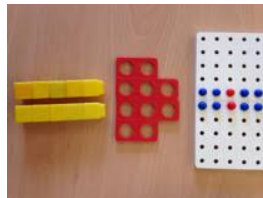


# Multiplication-EYFS

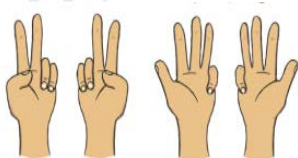
## Objectives

- Solve problems including doubling

## Concrete

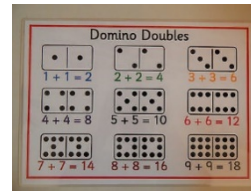
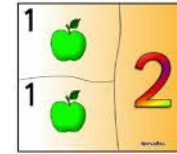
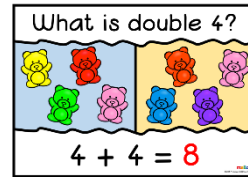


Counting and other maths resources for children to make 2 equal groups.



Physical and real life examples that encourage children to see concept of doubling as adding two equal groups.

## Pictorial



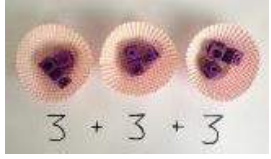



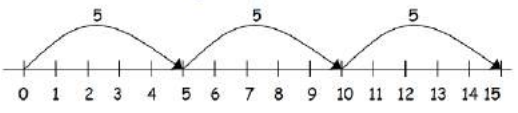




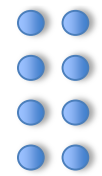
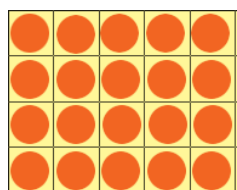

Pictures and icons that encourage children to see concept of doubling as adding two equal groups.

## Abstract





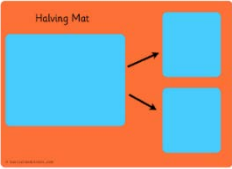


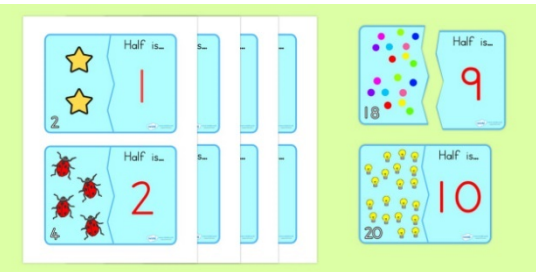
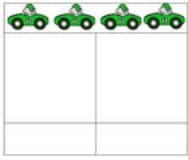
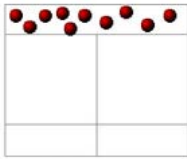
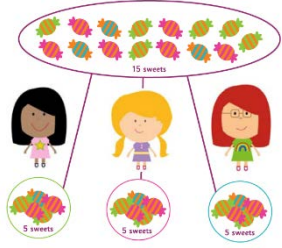
1+1=	7+7=
2+2=	8+8=
3+3=	9+9=
4+4=	10+10=
5+5=	11+11=
6+6=	12+12=

Addition calculations to model adding two equal groups.

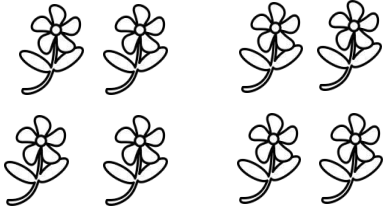
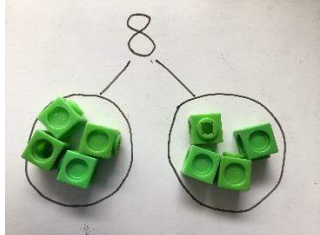
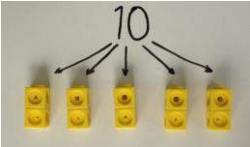
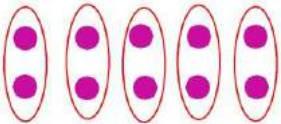
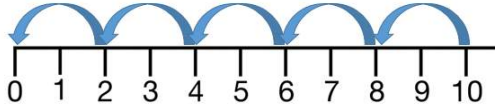
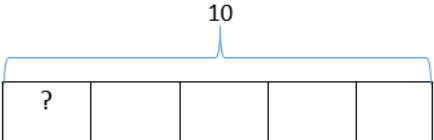
# CALCULATION GUIDANCE: Multiplication

	Objective	Concrete	Pictorial	Abstract
Year 1/2	Repeated addition	   <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>  $2 \times 4 = 8$  $4 \times 2 = 8$ <p>Link arrays to area of rectangles.</p> 	<p>Use an array to write multiplication sentences and reinforce repeated addition.</p>  $5 + 5 + 5 = 15$ $3 + 3 + 3 + 3 + 3 = 15$ $5 \times 3 = 15$ $3 \times 5 = 15$

# Division- EYFS

Objectives	Concrete	Pictorial	Abstract
<p>Solve problems including halving and sharing.</p> <ul style="list-style-type: none"> <li>Halving a whole, halving a quantity of objects.</li> <li>Sharing a quantity of objects.</li> </ul>	<div style="display: flex; justify-content: space-around;">   </div> <div style="text-align: center; margin-top: 10px;">  </div> <p style="text-align: center;">Children have the opportunity to physically cut objects, food or shapes in half.</p> <div style="display: flex; justify-content: space-around; margin-top: 20px;">  <div style="text-align: center;"> <p>Counting and other maths resources for children to share into two equal groups.</p>  </div> </div> <p style="margin-top: 20px;">Use visual supports such as halving mats and part part whole, with the physical objects and resources that can be manipulated.</p> <div style="display: flex; justify-content: space-around; margin-top: 20px;">  <div style="text-align: center;"> <p>Counting and other maths resources for children to explore sharing between 3 or more.</p>  </div> </div>	<div style="background-color: #e0ffe0; padding: 10px; margin-bottom: 10px;">  </div> <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> <div style="display: flex; justify-content: space-around; margin-top: 10px;">   </div> <p style="margin-top: 20px;">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> <div style="text-align: center; margin-top: 20px;">  </div> <p style="text-align: right; margin-top: 10px;">Pictures for children to create and visualise 3 or more equal groups.</p>	

# CALCULATION GUIDANCE: Division

	Objective	Concrete	Pictorial	Abstract
Year 1/2	Sharing	<p>I have 8 cubes, can you share them equally between two people?</p>	<p>Children use pictures or shapes to share quantities.</p>  <p style="text-align: center;"><math>8 \div 2 = 4</math></p>	<p>Share 8 buns between two people.</p> <p style="text-align: center;"><math>8 \div 2 = 4</math></p> 
	Grouping	<p>Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding.</p>  	<p>Use a number line to show jumps in groups. The number of jumps equals the number of groups.</p>  <p>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.</p>  <p style="text-align: center;"><math>10 \div 5 = ?</math></p> <p style="text-align: center;"><math>5 \times ? = 10</math></p>	<p><math>10 \div 5 = 2</math></p> <p>Divide 10 into 5 groups. How many are in each group?</p>