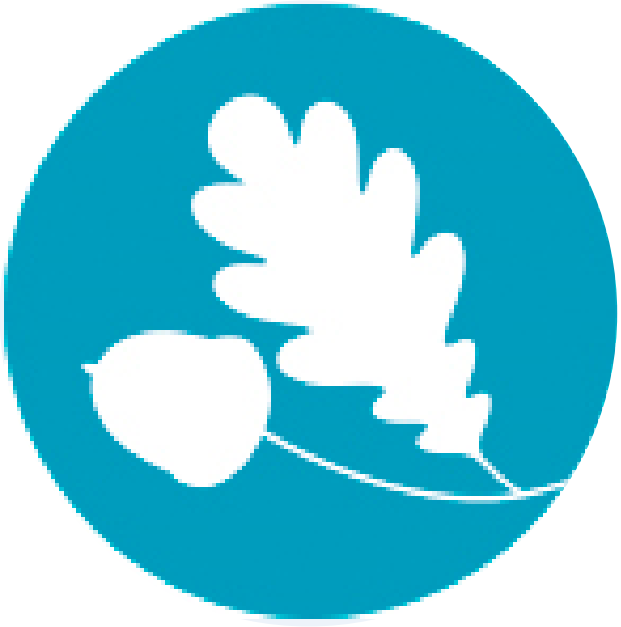
Merrylands Primary School & Nursery
Year 2 Maths Guide



Contents

How to use this guide

This is a guide for parents, carers and staff at Merrylands Primary School and Nursery. The purpose of this document is to allow everyone to see the different methods, models and images that are used to teach addition, subtraction, multiplication and division. This will allow parents and carers to help their children at home and will also ensure consistency in teaching at school.

Maths at Merrylands uses the principles of **'Concrete, Pictorial, Abstract' (CPA)**. Children start off using 'Concrete' resources, such as blocks and counters, which they can move and manipulate to represent calculations. They then move on to the 'Pictorial' stage where they may use or draw pictures to represent calculations. Finally, they move on to the 'Abstract' stage where they use numbers and symbols to show calculations.

Concrete methods and equipment will be used at some point in all year groups – using practical resources instead of abstract methods does not necessarily mean that a child is working below age-related expectations. Children may also use a variety of different methods to solve reasoning problems; again, this does not necessarily mean that they are working below the level expected for their age.

This guide is divided into three sections. The first section shows you the different objectives and methods that your child will encounter at school. In this section, each calculation type has been colour coded.

Addition methods are orange

Subtraction methods are blue

Multiplication methods are green

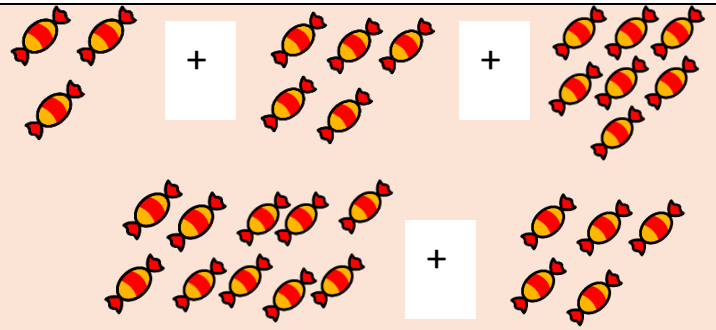
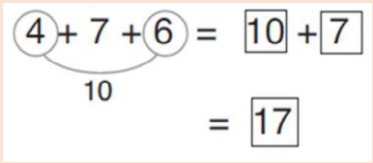
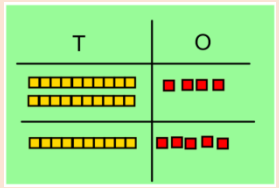
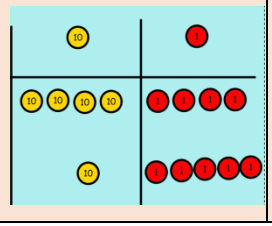
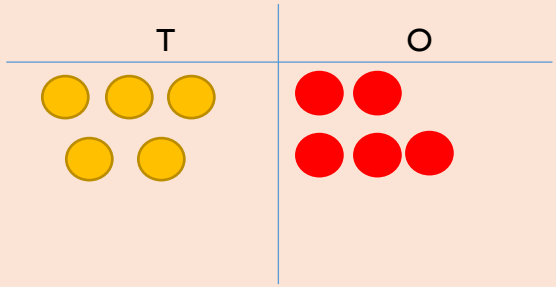
Division methods are yellow

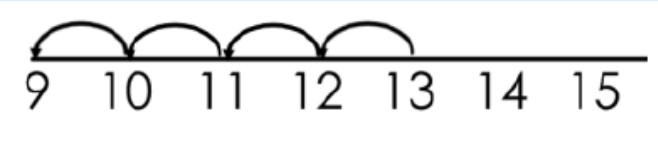
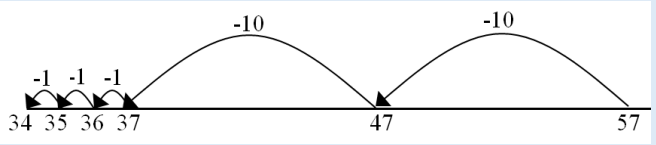
Each method shows you the concrete, pictorial and abstract ways to use each method. Different problems may require different methods – if your child finds a question difficult, see if they can use a different method to solve the problem.

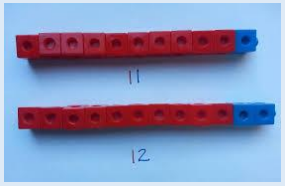
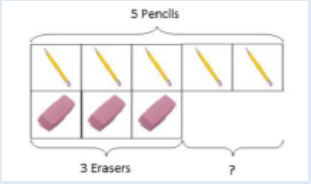
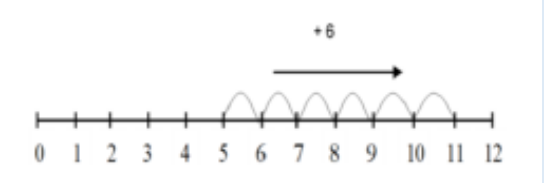
In the second section, you will find the National Curriculum objectives and the 'Big Ideas' for each year group. The Big Ideas are the key concepts that children need to understand in order to progress successfully. The National Curriculum objectives are what children need to achieve to be working at age-related expectations at the end of each year.

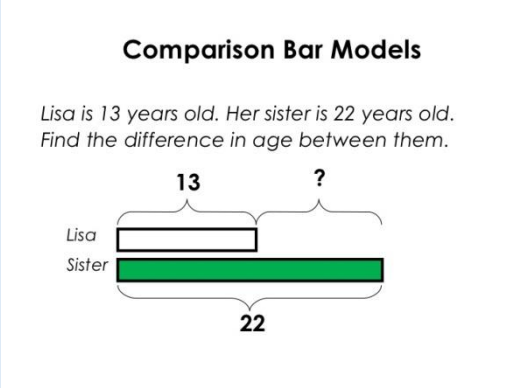
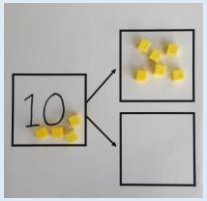
In the third section, you will find the new mathematical vocabulary that your child will encounter this year; this will build on the new words introduced and used in previous years.

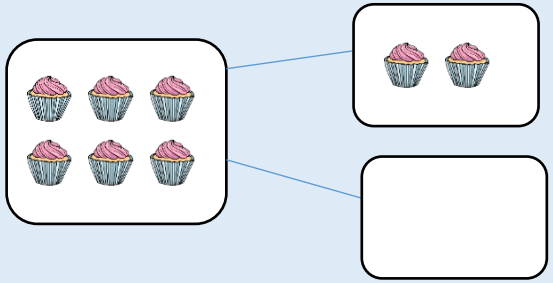
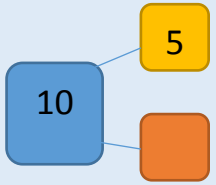
Year 2 Methods and Objectives

Objective and Strategies	Concrete	Pictorial	Abstract
Adding three single digits	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.
Column method- no regrouping	24 + 15= Add together the ones first then add the tens. Use the Base 10 blocks first before moving onto place value counters.  	After practically using the base 10 blocks and place value counters, children can draw the counters to help them to solve additions. 	Calculations 21 + 42 = 21 + 42

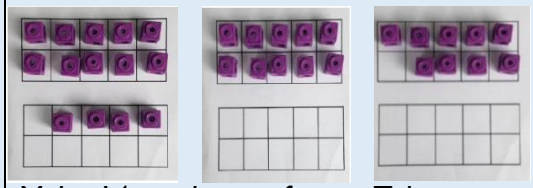
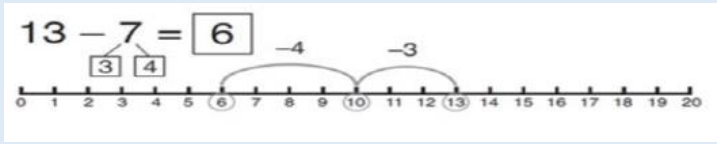
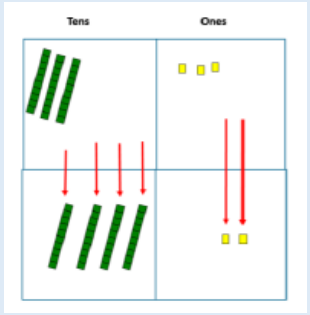
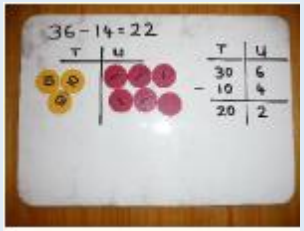
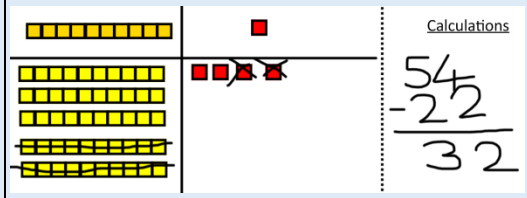
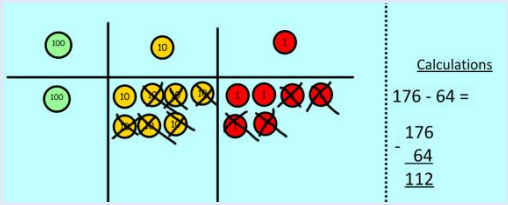
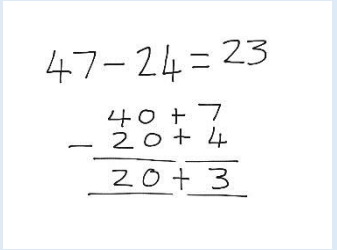
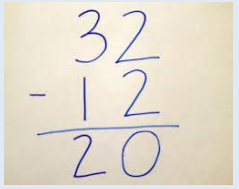
Objective and Strategies	Concrete	Pictorial	Abstract
Counting back	Make the larger number in your subtraction. Move the beads along your bead string as you count backwards in ones.  13 – 4 Use counters and move them away from the group as you take them away counting backwards as you go. 	Count back on a number line or number track  Start at the bigger number and count back the smaller number showing the jumps on the number line.  This can progress all the way to counting back using two 2 digit numbers.	Put 13 in your head, count back 4. What number are you at? Use your fingers to help.

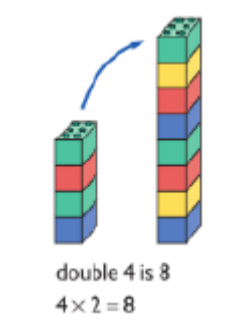
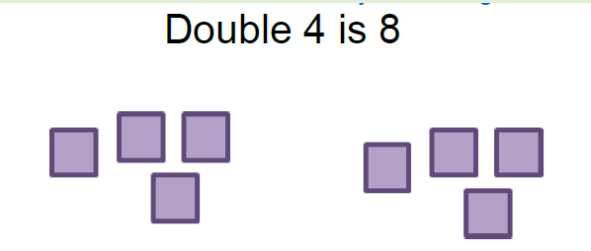
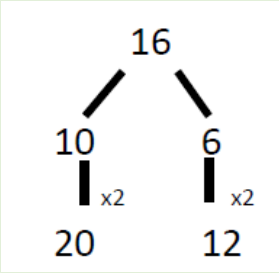
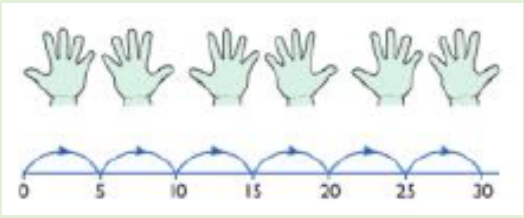
<table>
<tr><th>Objective and Strategies</th><th>Concrete</th><th>Pictorial</th><th>Abstract</th></tr>
<tr>
<td>Find the difference</td>
<td>Compare amounts and objects to find the difference.
 
Use cubes to build towers or make bars to find the difference
 
Use basic bar models with items to find the difference</td>
<td> 

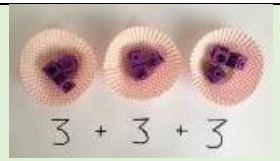
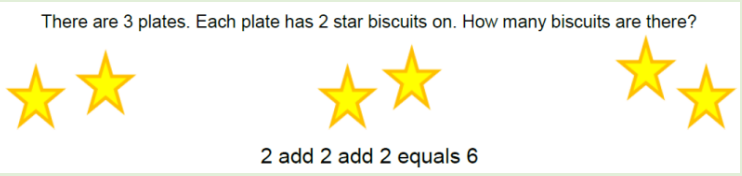
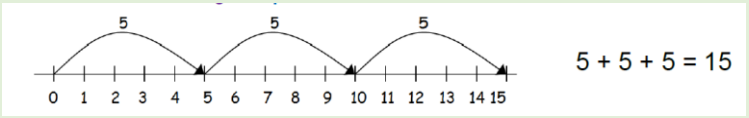
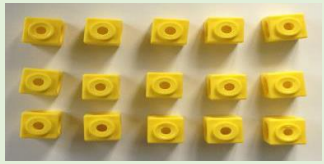
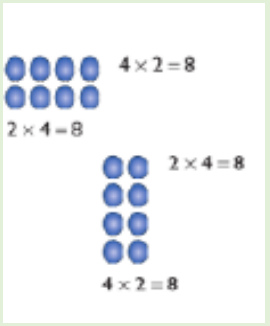
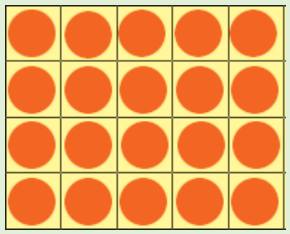
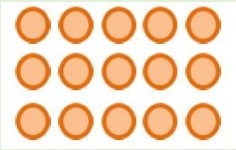
Count on to find the difference.
Draw bars to find the difference between 2 numbers.
 
</td>
<td>Hannah has 23 sandwiches, Helen has 15 sandwiches. Find the difference between the number of sandwiches.</td>
</tr>
<tr>
<td>Part Part Whole Model</td>
<td> 

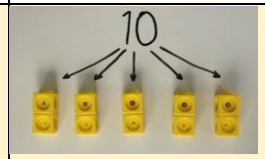
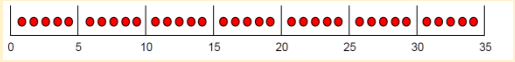
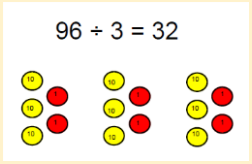
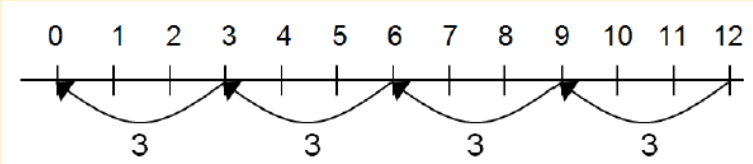
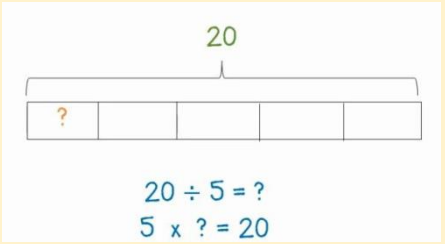
Link to addition- use the part whole model to help explain the inverse between addition and subtraction.
If 10 is the whole and 6 is one of the parts. What is the other part?
10 - 6 =</td>
<td>Use a pictorial representation of objects to show the part part whole model.
  </td>
<td> 

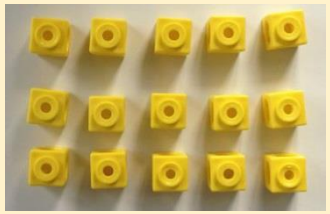
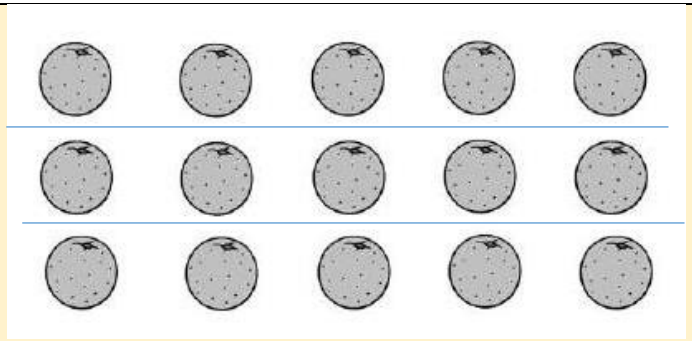
Move to using numbers within the part whole model.</td>
</tr>
</table>

Objective and Strategies	Concrete	Pictorial	Abstract
Make 10	14 – 9 =  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.	 Start at 13. Take away 3 to reach 10. Then take away the remaining 4 so you have taken away 7 altogether. You have reached your answer.	16 – 8= How many do we take off to reach the next 10? How many do we have left to take off?
Column method without regrouping	 Use Base 10 to make the bigger number then take the smaller number away. Show how you partition numbers to subtract. Again make the larger number first. 	 Draw the Base 10 or place value counters alongside the written calculation to help to show working. 	 This will lead to a clear written column subtraction. 

Objective and Strategies	Concrete	Pictorial	Abstract
Doubling	 Use practical activities to show how to double a number.	Draw pictures to show how to double a number. 	 Partition a number and then double each part before recombining it back together.
Counting in multiples	  Count in multiples supported by concrete objects in equal groups.	 Use a number line or pictures to continue support in counting in multiples.	Count in multiples of a number aloud. Write sequences with multiples of numbers. 2, 4, 6, 8, 10 5, 10, 15, 20, 25 , 30

Objective and Strategies	Concrete	Pictorial	Abstract
Repeated addition	   Use different objects to add equal groups.	 	Write addition sentences to describe objects and pictures. 
Arrays- showing commutative multiplication	Create arrays using counters/ cubes to show multiplication sentences.  	Draw arrays in different rotations to find **commutative** multiplication sentences.   Link arrays to area of rectangles.	Use an array to write multiplication sentences and reinforce repeated addition.  5 + 5 + 5 = 15 3 + 3 + 3 + 3 + 3 = 15 5 x 3 = 15 3 x 5 = 15

Objective and Strategies	Concrete	Pictorial	Abstract
Division as 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. 	28 ÷ 7 = 4 Divide 28 into 7 groups. How many are in each group?

Division within arrays	 Link division to multiplication by creating an array and thinking about the number sentences that can be created. Eg 15 ÷ 3 = 5 5 x 3 = 15 15 ÷ 5 = 3 3 x 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. 7 x 4 = 28 4 x 7 = 28 28 ÷ 7 = 4 28 ÷ 4 = 7

Year 2 Curriculum Expectations and Big Ideas

End of Year 2 Expectations	Big Ideas
Pupils should be taught to: • compare and order numbers from 0 up to 100 • use place value and number facts to solve problems • use < > and = signs correctly • count in steps of two, three, and five from 0, and in tens from any number, forward and backward • solve problems with addition and subtraction using concrete objects and pictorial representations, including those involving numbers, quantities and measures • apply an increasing knowledge of mental and written methods • recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 • add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a 2-digit number and ones; a 2-digit number and tens; two 2-digit numbers; and adding three 1-digit numbers • show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot • recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers • calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs • show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot • solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts	• The position (place) of a digit in a number determines its value. Hence the term *place value*. • Understanding that addition of two or more numbers can be done in any order is important to support children's fluency. When adding two numbers it can be more efficient to put the larger number first. For example, given 3 + 8 it is easier to calculate 8 + 3. • When adding three or more numbers it is helpful to look for pairs of numbers that are easy to add. For example, given 5 + 8 + 2 it is easier to add 8 + 2 first than to begin with 5 + 8. • Understanding the importance of the equals sign meaning 'equivalent to' (i.e. that 6 + 4 = 10, 10 = 6 + 4 and 5 + 5 = 6 + 4 are all valid uses of the equals sign) is crucial for later work in algebra. Empty box problems can support the development of this key idea. Correct use of the equals sign should be reinforced at all times. Altering where the equals sign is placed develops fluency and flexibility. • It is important that pupils both commit multiplication facts to memory and also develop an understanding of conceptual relationships. This will aid them in using known facts to work out unknown facts and in solving problems. • Pupils should look for and recognise patterns within tables and connections between them (e.g. 5× is half of 10×). • Pupils should recognise multiplication and division as inverse operations and use this knowledge to solve problems. They should also recognise division as both grouping and sharing. • The recognition of pattern in multiplication helps pupils commit facts to memory, for example doubling twice is the same as multiplying by four, or halving a multiple of ten gives you the related multiple of five.

New Vocabulary for Year 2

Number and place value	Fractions	General/problem solving
Numbers to one hundred Hundreds Partition, recombine Hundred more/less	Three quarters, one third, a third Equivalence, equivalent	Predict Describe the pattern, describe the rule Find, find all, find different Investigate