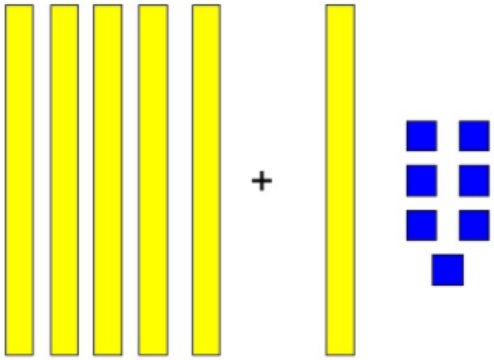
Maths strategies to support your child

Addition



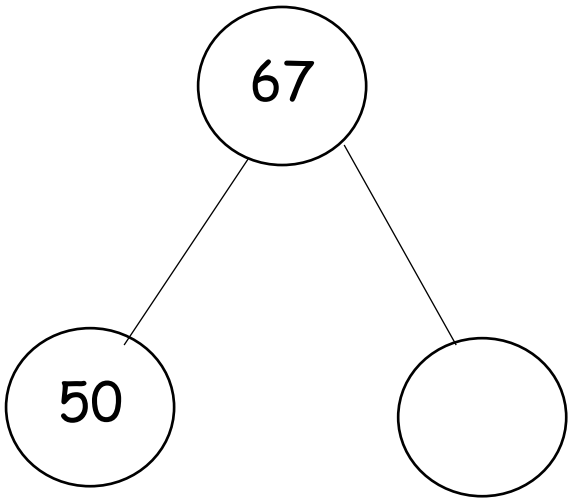
To ensure a deeper understanding and a more visual method, the children may prefer to draw out the tens and ones and add these together, as shown in the diagram to the left.

50 + 17 =

67	
50	

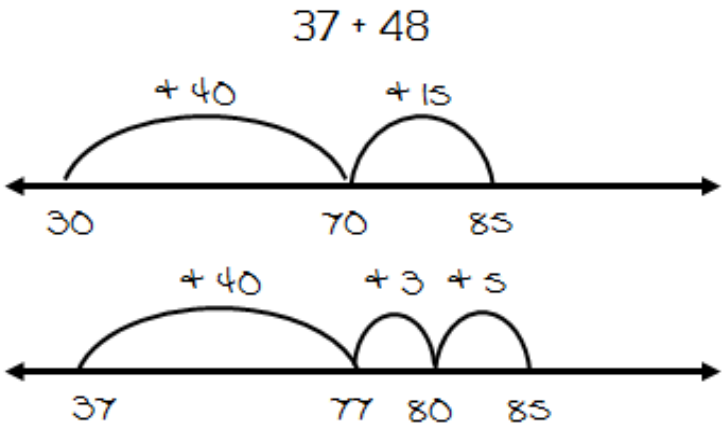
Bar Model:

A bar model is used when adding. The top number is the 'whole' and the two numbers underneath add up to the whole.



Part, Whole Model:

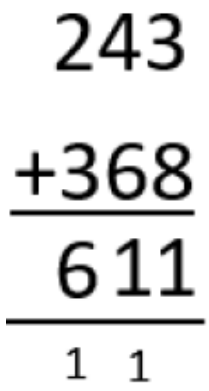
This model is used much as the bar model to show the two parts which make a whole. The children are encouraged to use mental methods such as counting on to find the missing number



Generally, we tend to recommend that most children are able to use a number line to solve addition problems. To the left are 2 different ways of solving the same addition problem using a number line. *Image 1 shows the concept of separating out the tens and ones (formally called tens and units) and adding these separately.

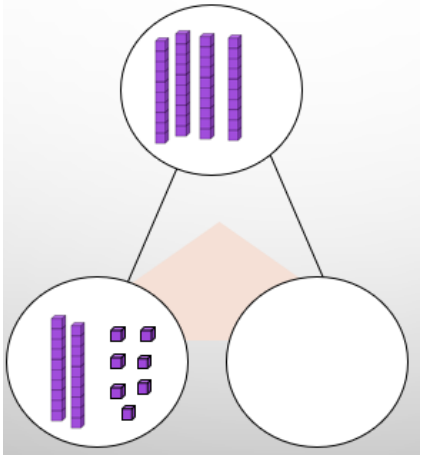
*Image 2 show the concept of starting with one of the numbers, adding the tens and then separating the ones out, adding the ones to bridge the next tens number, then adding the remaining ones.

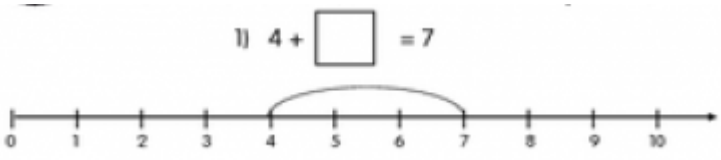
N.B Often we would also encourage children to start with the largest number first in addition, though this is not essential as addition is commutative – it can be done in any order.



In Year Two your child may begin column addition. This is particularly useful for speedy calculating; however, children need plenty of practise to help them to use the method effectively – always start with adding the ones column first and carry any numbers underneath the next column. It is important not to forget to include it in the final calculation.

Missing number addition





__ + 12 = 24 → 24 – 12 = __

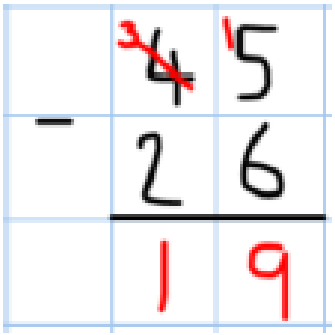
14 + __ = 44 → 44 – 14 = __

* Many children find missing number additions quite tricky. Dienes (Base 10) can be used effectively to find the missing number in ***addition and subtraction*** problems. E.g. __+27 = 40. 40 – 27 = __. By representing 27 in Dienes and 40 in Dienes, the children will then be able to visually see what is missing.

*Children can also use a number line, starting at the first number and ending at the answer, the children then make jumps (as they would with a normal addition on a number line) along the line in between and work out what they have added to their initial number to reach the answer.

*The other method is simply using the inverse operation – for a missing number addition the children can simply reverse the calculation to solve it as a subtraction problem.

Subtraction

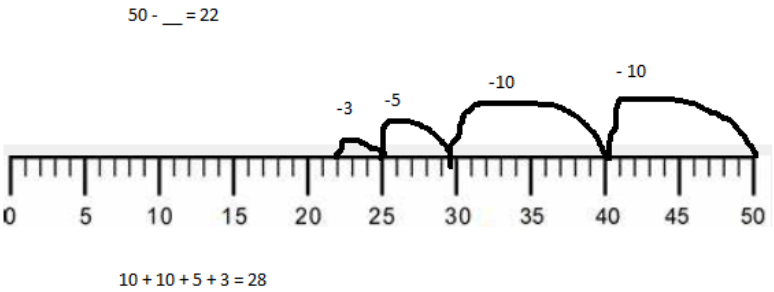


When solving subtraction problems, we recommend broadly the same methods as for addition. A number line is usually the preferred strategy – we recommend the children put the largest number at the right-hand side of the number line and make jumps backwards along the number line in the same way they would make forward jumps for an addition. As explained, drawing representations is less effective for subtraction due to the issues caused when crossing the tens barrier.

The second method would be column subtraction. As with column addition, the children need to be confident in the strategy to use this method, particularly where they need to exchange (sometimes called borrowing) from the next column.

Subtraction with missing numbers

17 - __ = 12 → 17 – 12 = __

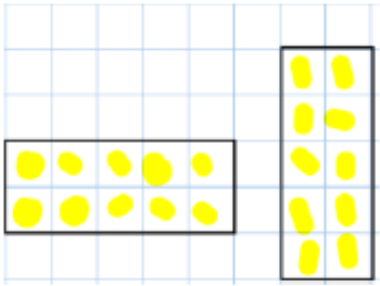


□ - 17 = 8 → 8 + 17 = □

As with addition, subtraction with missing numbers often causes confusion for the children. The same method can be used with the Dienes representations to find missing numbers as shown previously. Where the second number is the missing number (as in the number sentence to the left) the children can also either reverse the order of the numbers and solve it as a normal subtraction question or they can simply start at biggest number and count backwards. This could be done on a number line in a similar method to missing number addition – start with the largest number and make jumps counting backwards until they get to the answer.

*In some missing number subtractions, the first number is missing. In this case, the children need to understand that in a subtraction the first number will always be the biggest and so they will need to add the two other numbers in the question. This can be done using any normal addition method.

Multiplication

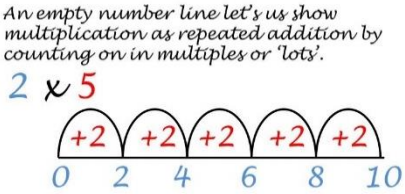


5 x 2 = 10 or 2 x 5 = 10

__ x 5 = 30 → 30 ÷ 5 = __

2 x 5 = 5 + 5

5 x 2 = 2 + 2 + 2 + 2 +2



Arrays:

We encourage them to draw an array (as shown in the diagram to the left) as this allows them to physically see what they are trying to represent, in this case 5 groups of 2 or 2 groups of 5. The children can then count the dots to help them to solve the problem. (Ideally, we would like the children to be confident in their 2, 5 and 10 times table knowledge anyway including the division facts, however they also need a concrete method to help them should they need it). If the question is in the 10 times tables e.g. 8 x 10 = __ they could draw 8 blocks of 10 using Dienes representation (8 long thin rectangles) and count these in 10s if they need to.

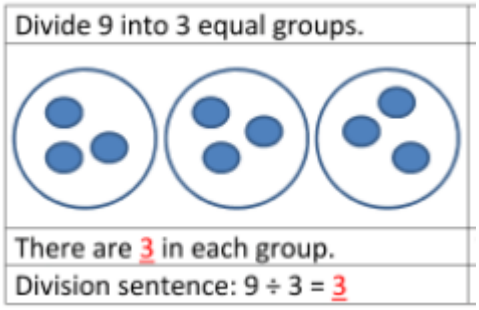
Blank number lines:

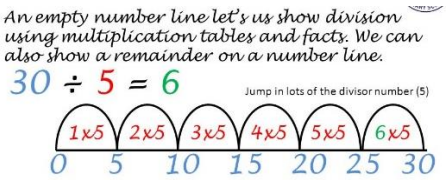
Children can also record jumps on a blank number line. Each jump is worth the amount you are multiplying.

*For a missing number multiplication, we'd encourage them to use the inverse operation (a division) using the usual division methods.

*The children will also need to recognise the equivalence of multiplication and repeated addition as shown to the left.

Division





When dividing, the children work very visually, as they do with multiplication.

*Usually, we encourage the children to 'share'. So, 9 ÷ 3 = would simply involve the children drawing 3 groups and sharing 9 between them in a logical way (generally 1 in group 1, 1 in group 2, 1 in group 3 etc.) until they've reached their number.

We can also use a blank number line as in multiplication but working from right to left to see how many groups of… are in a number.

*In the same way that we can reorder missing number subtractions, the same can be said for a missing number division. Where the second number is missing, we simply reorder the division sentence, where the first number is missing, the calculation changes to a multiplication.

12 ÷ __ = 6 → 12 ÷ 6 = __

__ ÷2 = 6 → 6 x 2 = __

Need to know

To successfully use these methods, your child needs to be able to do some basic calculations mentally. These include:

*Counting forwards and backwards in 10s from any number (and recognising that this is the same as adding and subtracting a multiple of 10)

* Being confident in their number bonds to 10 and manipulating this for larger numbers (if 3 + 7 = 10 then 23 + 7 = 30)

* Counting forwards and backwards from any number, including crossing 10s barriers and into the lower 100 numbers (generally not higher than approximately 120 at this stage).

Please be aware that whilst the skills of the 4 operations described are essential, the children also will need to be able to answer these questions when written as word problems and should be able to recognise the different words (listed below) that may be used in the questions.

Addition	Subtraction	Multiplication	Division
Plus	Less	Times	Each
And	Difference	Multiply	Share among
Total	Minus	Product	Divide
Altogether	Less than	Lots of	Share equally
Sum of	Fewer	Groups of	group
More than	Decrease		
Increase			

Fact families

4 + 16 = 20	20 – 4 = 16	5 x 4 = 20	20 ÷ 5 = 4
16 + 4 = 20	20 – 16 = 4	4 x 5 = 20	20 ÷ 4 = 5

N.B. More complex questions will ask children to add and subtract within the same question which is something they need to be prepared for e.g. there are 13 cars are in a car park. 12 more arrive and 15 leave, how many cars are now in the car park?

Stanley Green Infant Academy 2018