

Year 2 Calculation Methods

Addition – Add a 1-digit number to a 2-digit number

Eg. $37 + 6 =$

We would expect the children to be able to do this mentally either by:

1. Starting at the larger addend and counting on to find the total (using fingers to help keep count.)
2. Finding a number bond to help them

Eg. $37 + 6 =$



You could partition 6 into $6 = 3 + 3$. Children should be able to identify that $7 + 3$ is a number bond to 10. Therefore $37 + 3 = 40$ and then they should add the remaining 3 to $= 43$.

If children are unable to use these mental methods, they should calculate on a number line, beginning with the largest addend and counting on the smaller addend OR draw diennes. (Tens and Ones)

Number line method

Eg.

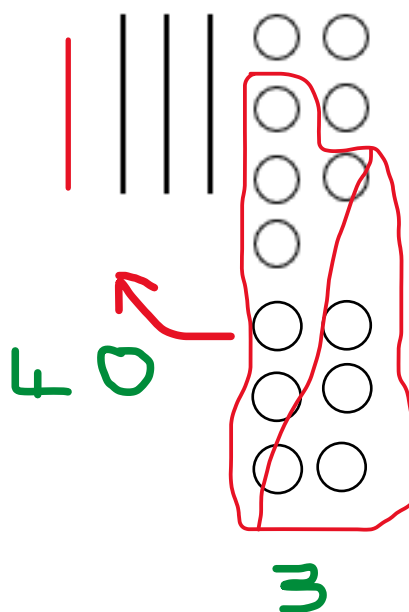
$$37 + 6 =$$



Diennes method

Begin with the largest addend and draw the diennes for both addends. If preferred, just draw the second one-digit addend and count on from the largest number.

Eg $37 + 6 =$

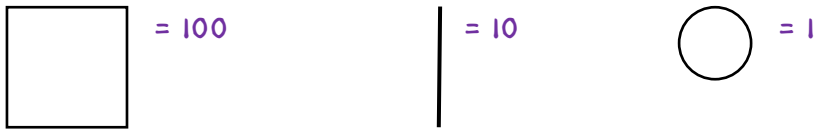


There are more than ten ones, so ten ones are exchanged for a ten stick.

Addition – Add a 2-digit number to a 2-digit number

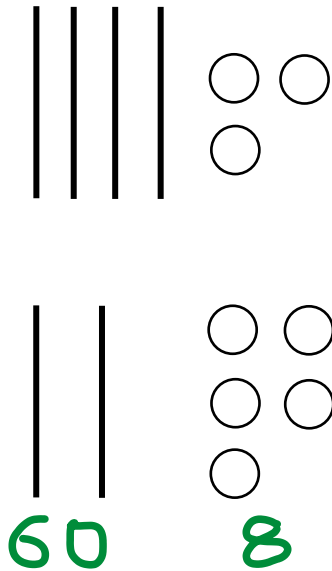
When adding 2-digit numbers we would expect the children to draw a visual representation using diennes. This will help them with their conceptual understanding when moving onto column methods in Key Stage 2 (especially when exchanging 10s and 1s)

When drawing diennes:



eg. $43 + 25 =$

The children should draw both addends in diennes underneath each other.



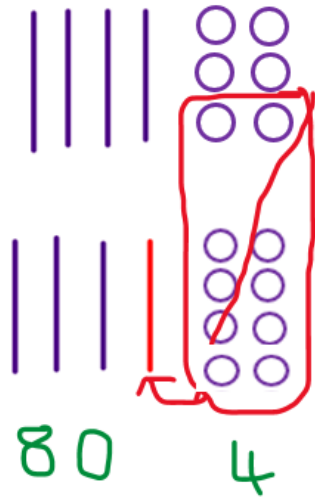
They should then total the ones and the tens to find the answer. Children should always start totalling the ones first (again, this helps them when they move to column methods).

In this case there are 8 ones and 6 tens which = 68

Exchanging

If, when totalling the ones, the children count more than 10, they should exchange ten ones for a ten stick. They do this by drawing around 10 ones, crossing it out and drawing an extra 10 stick with the other tens before totalling.

Eg. $46 + 38 =$



There are more than ten ones, so ten ones are exchanged for a ten stick.

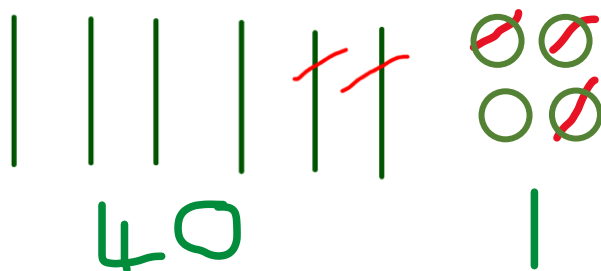
Now the total can be found as before. With the extra 10, there are 8 tens and 4 remaining ones which = 84.

Subtraction

As with addition, the children should draw diennes to calculate subtractions to support their understanding of place value before moving to column methods. When subtracting, the children should only draw the **minuend** (the largest number in the calculation). They should then look at the **subtrahend** (the number being subtracted) and cross out the correct number of ones and tens before counting the remaining tens and ones.

As with addition, it is important that children subtract the **ones** before the tens in case they need to exchange.

Eg. $64 - 23 = 41$



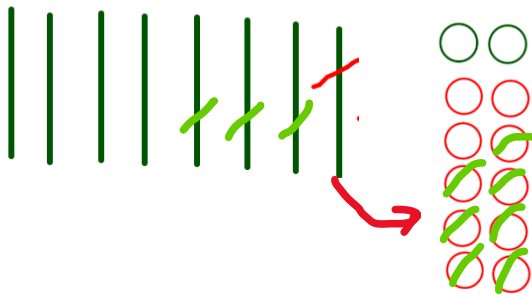
After the 3 ones and 2 tens have been subtracted, you can count the number of tens and ones remaining.

Subtraction –exchanging or regrouping

In some cases, there will not be enough ones in the minuend (first number) to subtract the subtrahend.

In this case, they should exchange 1 ten block for 10 separate ones so there are enough ones to subtract from.

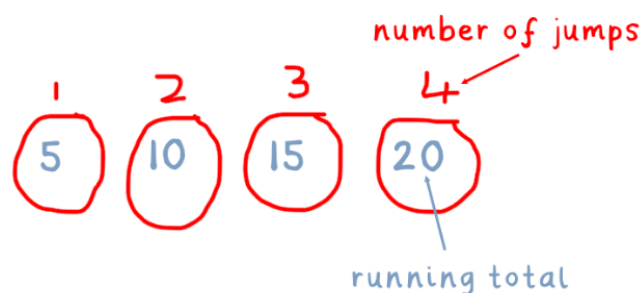
Eg. $82 - 37 =$



Multiplication

By the end of year 2, children should be able to fluently count in steps of 2, 5 and 10 in order to calculate multiplication facts for these times tables. This is sometimes referred to as 'skip counting' and can be done mentally, or by writing down the number of jumps and totals as below.

Eg. $4 \times 5 = 20$



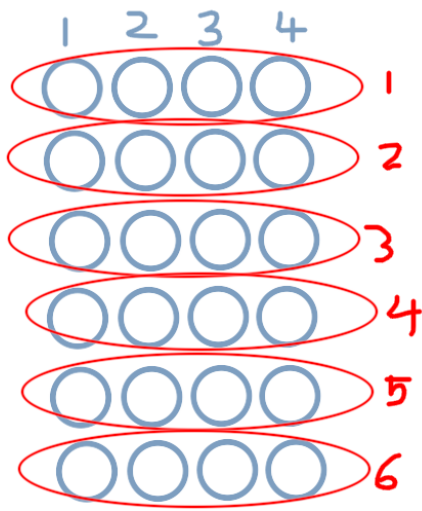
For multiplications outside known facts, children should use an array or other suitable drawings of equal groups to calculate.

Eg. $6 \times 4 = 24$

6 lots of 4 = 24

6 groups of 4 = 24

6 rows of 4 = 24



When drawing an array, it is important that the circles are kept in line to avoid errors.

Circles are encouraged rather than crosses as they can be clearly crossed out when counting the total which helps to avoid miscounting.

The array shows 6 equal groups of 4. After drawing, children should total all the circles they have drawn.

Division

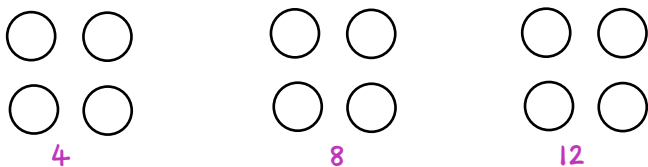
In year 2 we explain division as sharing or grouping into equal groups. Children should be familiar with the vocabulary dividend, divisor and quotient when referring to division calculations (see below).

$$12 \div 4 = 3$$

dividend divisor quotient

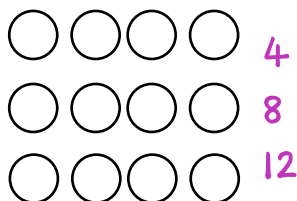
Equal Grouping

Draw groups of the divisor then count how many groups you have made.



There are 3 equal groups of 4 in 12.

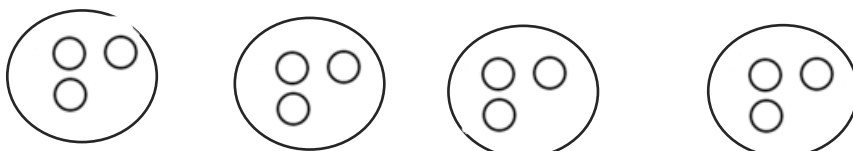
Arrays Again draw groups of the divisor, this time in ROWS



The array shows 3 equal rows (groups) of 4 make 12.

Sharing

12 shared equally between 4 is 3.



Again, it is recommended that the children represent the number they are sharing as circles because it links to their understanding of diennes and they are easily crossed out to ensure accurate counting when totalling the quotient.

Larger Numbers

If dividing a larger 2-digit number, we would encourage children to use diennes to represent 10s and 1s or the process will take too long. We recommend using 10s and 1s ONLY when the tens digit of the dividend is larger than the divisor. Children should equally divide the tens first, then the ones.

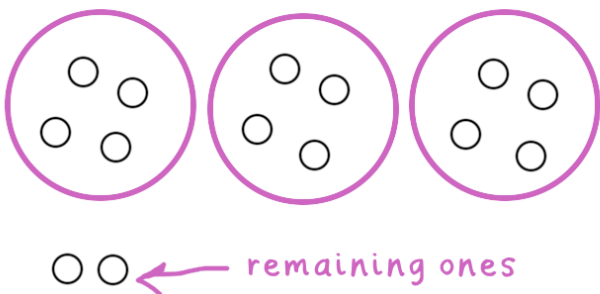
eg. $63 \div 3 = 21$



Remainders

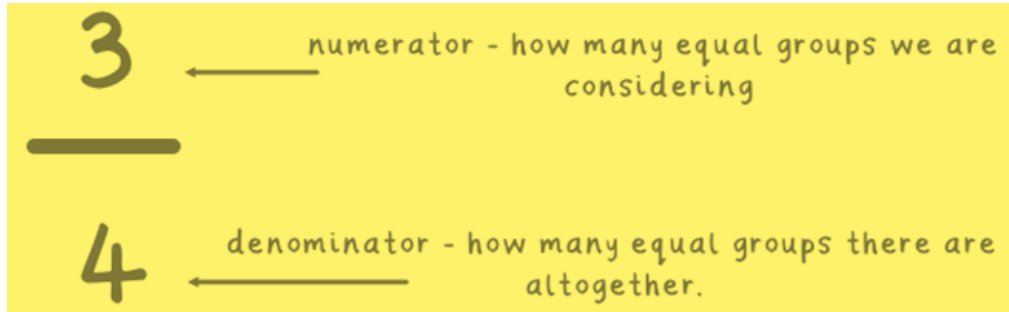
If the dividend cannot be shared equally amongst the circles, the children should record this as a remainder. The process is the same but once they get to a point where they do not have enough ones left for each circle to have one, they should draw the remaining ones outside the circle until they have counted to the dividend.

eg. $14 \div 3 = 4 \text{ r } 2$

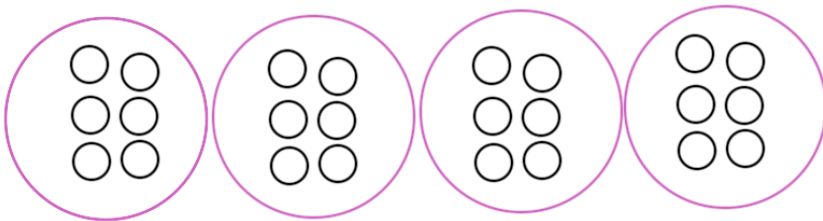


Fractions of quantities

Finding fractions of quantities is strongly linked to division and children should use the same method with sharing circles. However, with fractions of quantities, after sharing into equal groups, children may have to total more than one group.



eg. $\frac{3}{4}$ of 24 = 18



For this calculation, children should first look at the denominator. This tells us how many equal groups there should be. They should share the total between this number of circles as with division.

After sharing into equal groups, children should look at the numerator, which tells us how many groups we are considering. In this case, we need to total 3 out of the 4 quarters. There are 6 in each quarter so $\frac{3}{4}$ of 24 = 18.