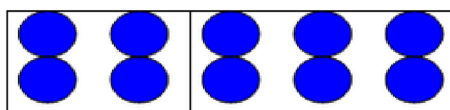
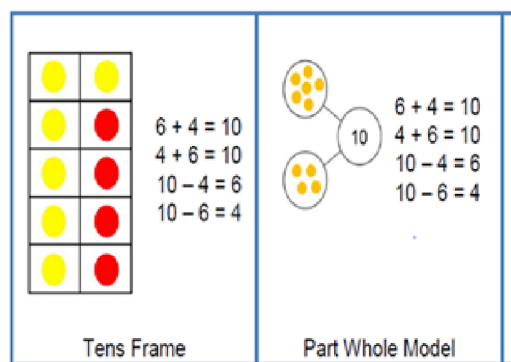
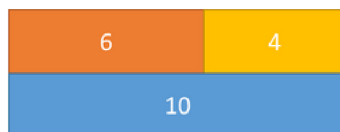


Early Years

At a party I ate 4 cakes and my friend ate 6 cakes. How many cakes did we eat altogether?



Children are encouraged to think about how we know the size of a part and another part and we need to calculate the whole.



part + part = whole

By the end of Reception, children will be applying their sense of number to problems like these.

Tens frames and part whole models are used to show the mathematics.

Cubes/counters can be used to represent real-life objects.

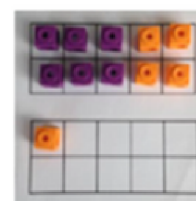


Key Stage 1

Children will continue using a tens frame and part whole model to combine two parts to make a whole.



$$6 + 5 = 11$$



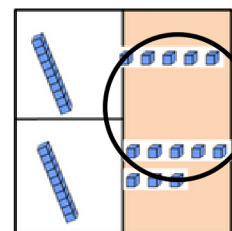
Start with the bigger number and use the smaller number to make 10.

One strategy children are encouraged to use is to regroup and make 10 when solving addition calculations.

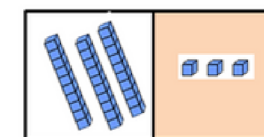
By the end of year 2, children will be crossing the tens boundary and renaming ones.

There are 15 children in one class and 18 in another. How many children are there altogether?

$$15 + 18 =$$



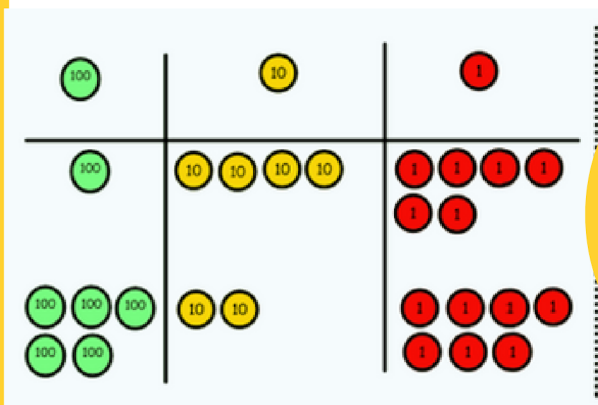
10 ones is the same as 1 ten.



Years 3 & 4

In Year 3, children add numbers up to 1000 and in year 4 children add up to 4-digit numbers.

There are 146 girls in a school and 527 boys. How many children are there altogether?



The use of place value counters can help children represent and see the Mathematics, especially with the element of renaming (having more than 10 of a unit)

addend + addend = sum

Children use the expanded column method before using the standard written method.

$$\begin{array}{r} 146 \\ + 527 \\ \hline 13 \text{ (add the ones)} \\ 60 \text{ (add the tens)} \\ 600 \text{ (add the hundreds)} \\ \hline 673 \end{array}$$

$$\begin{array}{r} 146 \\ + 527 \\ \hline 673 \\ 1 \end{array}$$

There are 673 children altogether.

Years 5 & 6

2.656 m of string is added to 3.4 m of string. How long is the piece of string now?



Children are encouraged to use bar models to represent the problem.

$$\begin{array}{r} 2.656 \\ + 3.400 \\ \hline 6.056 \\ 1 \end{array}$$

6.056 metres of string

Empty decimal places should be filled with 0 to show the place value in each column.

By the end of year 6, children will be using the standard written method to add integers up to 10 million and decimal fractions with up to 3 decimal places.

Early Years

Children will work with the numbers to at least 10. They will begin to relate subtraction to 'taking away' using objects to count 'how many are left' after some have been taken away.

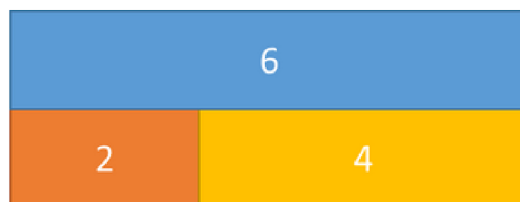
$$6 - 2 = 4$$



If I eat 2 cakes, how many are left?

Children cross out drawn objects to show what has been taken away.

whole - part = part



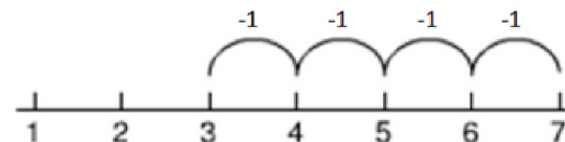
Children use real-life objects, counters and cubes to show how objects can be taken away.

Number lines and number tracks are also used to count back.

Key Stage 1

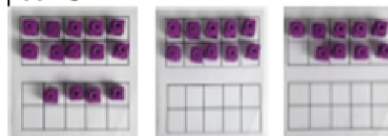
Children will continue to subtract by crossing out.

There are 7 people on the bus and 4 people get off. How many are on the bus?

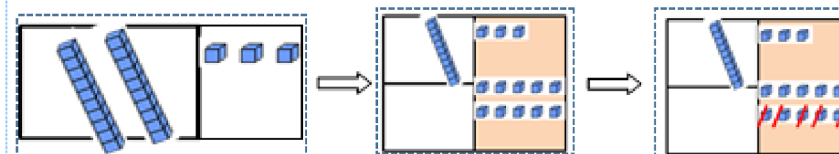


Another strategy is making 10. Children subtract the four first to make 10 and then takeaway one more so you have taken away 5. You are left with the answer of 9.

$$14 - 9 =$$

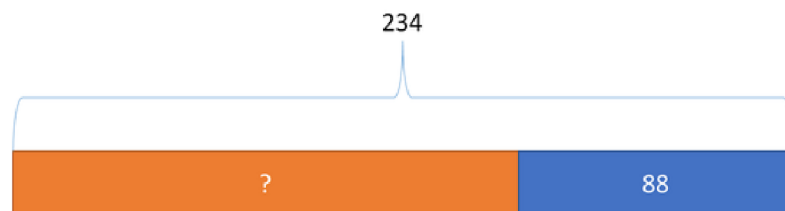


By the end of year 2, children will work with numbers to at least 100. Children need to be confident with the use of diennes, part whole and place value counters as well as written methods.

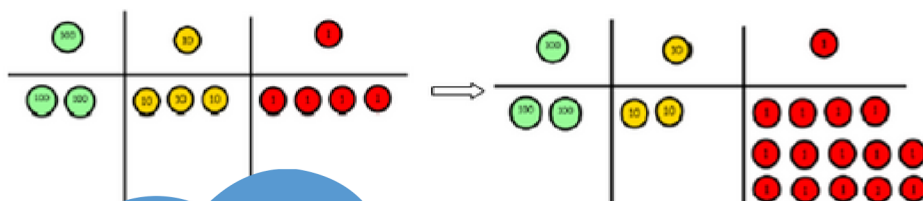


Years 3 & 4

There are 234 seats at a concert. If 88 people leave at the interval, how many people remain?



minuend - subtrahend = difference



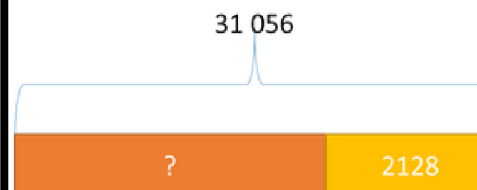
Place value counters of Hundreds, Tens and Ones are used to represent the number to start with and here the children are regrouping the ten into 10 ones as they can not subtract 8 ones from 4 ones

$$\begin{array}{r} 1 \ 2 \ 4 \\ \cancel{2}34 \\ - \quad 88 \\ \hline 146 \end{array}$$

146 people remain at the stadium

Years 5 & 6

There are 31,056 books in a library. This decreases by 2,128, how many remain?



Instead of putting a little 1 next to the 6 for the added 10, the children cross out 10, the children cross out and rename as 16 ones

The column method for subtraction is used for calculating differences with numbers up to 10 million and for problems involving money and measures.

$$\begin{array}{r} 2 \ 10 \ 10 \ 4 \ 16 \\ \cancel{3} \ \cancel{1} \ \cancel{0} \ \cancel{5} \ \cancel{6} \\ - \quad 2 \ 1 \ 2 \ 8 \\ \hline 2 \ 8 \ 9 \ 2 \ 8 \end{array}$$

If children have to subtract from integers with a number of 0s e.g. 25000 - 3569, one strategy the children are taught is to adjust (take 1 from the whole e.g. 25 000 - 1 = 24 999) and then subtract the part and then at the end add 1 back on..

$$\begin{array}{r} 24999 \\ - \quad 3579 \\ \hline 21420 \end{array}$$

$$21\ 420 + 1 = 21\ 421$$

$$\text{so, } 25\ 000 - 3569 = 21\ 421$$

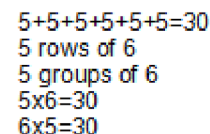
Key Stage 1

Children will count repeated groups of the same size in practical context

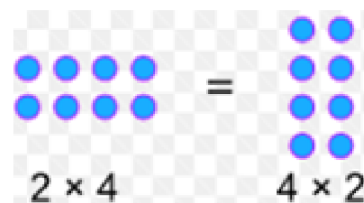
How many legs will 4 teddies have?


$$2 + 2 + 2 + 2 = 8$$

I have 6 pots of 5 crayons. How many crayons do I have altogether?



The use of counters/cubes can represent the arrays used in multiplication.



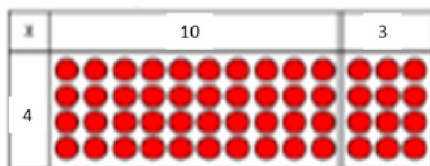
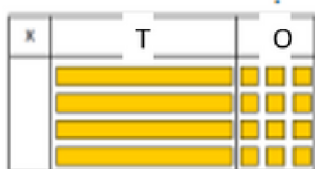
The use of arrays are used to show children that multiplication is **commutative** and can be done in any order.

Years 3 & 4

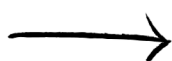
In Lower key Stage 2, children move onto more formal methods for multiplication and short multiplication.

4 books were sold. Each book cost £13. How much money was taken?

factor x factor = product



$$\begin{array}{r} 13 \\ \times 4 \\ \hline 12 \text{ (3 x 4)} \\ 40 \text{ (10 x 4)} \\ \hline 52 \end{array}$$

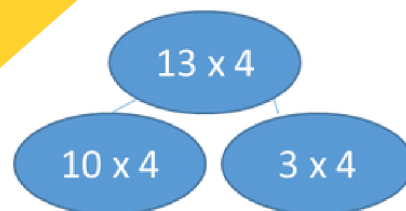


$$\begin{array}{r} 13 \\ \times 4 \\ \hline 52 \end{array}$$

In total £52 was taken.

Bar models help the children to see multiplication as repeated subtraction.

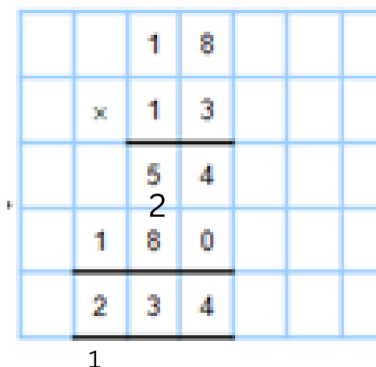
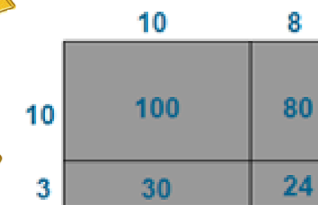
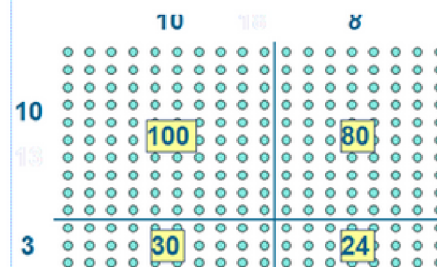
The use of arrays, dienes and place value counters, will help to represent this partitioning before moving onto the grid method.



Years 5 & 6

Children use short multiplication (for multiplying by a single digit) and long multiplication (for multiplying by two-digits).

There are 18 chairs in a row and 13 rows of chairs. What is the total number of chairs?



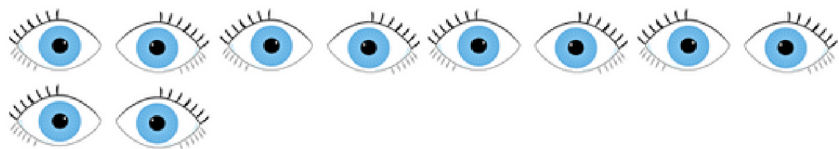
Children are encouraged to think about what is the same/different between the methods.

The total number of chairs is 234

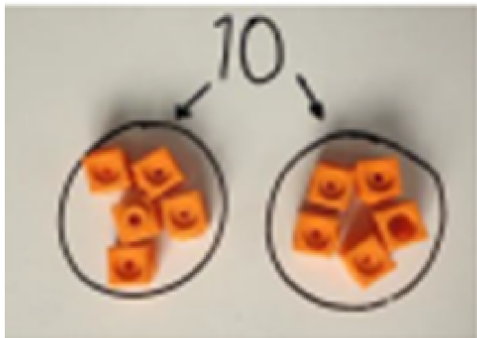
Early Years

In practical activities and through discussion they will begin to solve problems involving halving and sharing.

There are 10 eyes. Each person has 2 eyes. How many people are there?



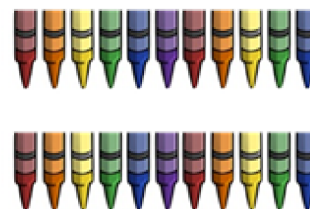
I have 10 cubes, I share them equally between 2 people.



'Half of the cubes are for you and half of the cubes are for me.'

Key Stage 1

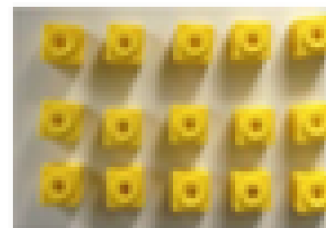
Children use practically a range of resources to solve problems involving both grouping and sharing.



Sharing: 20 crayons are shared between 2 pots

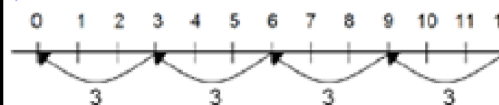
Grouping: We have 20 crayons and we put 10 crayons in each pot. How many pots do we need?

How many groups of 3 are in 15?



Children need to understand this represents $15 \div 3$
They also need to understand this represents $15 \div 5 = 3$ when represented horizontally.

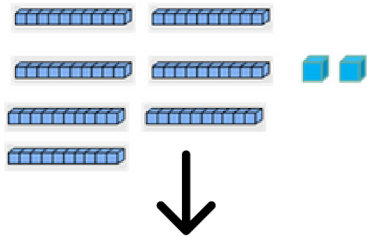
A CD costs £3. How many CD's can I buy with £12?



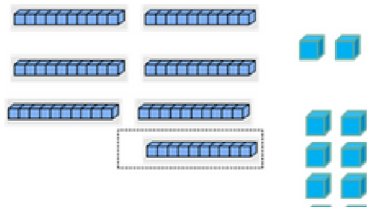
Children use a number line to show jumps in groups. The number of jumps equals the number of groups.

Years 3 & 4

72 books are sold. The shop sold 3 books a day.
How many days did it take to sell all the books?

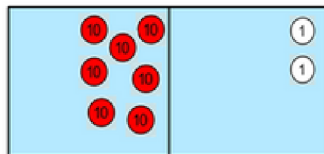


Dividing 7 tens by 3 = 2
tens with one ten
remaining.

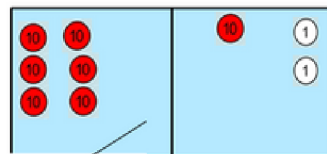


The remaining ten can then be
regrouped into ones so now we
have 12 ones divided by 3 = 4

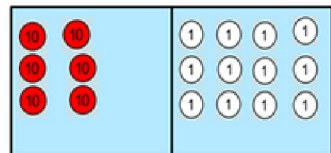
$$72 \div 3$$



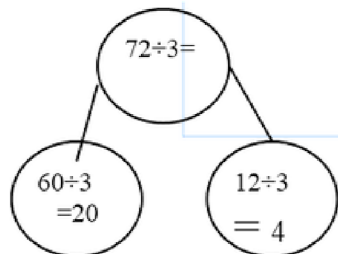
$$72 \div 3$$



$$72 \div 3$$



Short division



dividend ÷ divisor = quotient

Years 5 & 6

Children will continue to use short division when
dividing by a single integer. In year 6, children
are taught long division for dividing by 2-digits.

187 books are sold. The shop sold 4 books a day. How
many days did it take to sell all of the books?

The remainder could be
expressed as:

$$\begin{aligned} 187 \div 4 &= 46 \text{ r}3 \\ 187 \div 4 &= 46 \frac{3}{4} \\ 187 \div 4 &= 46.75 \end{aligned}$$

Children need to understand
the need to round up, i.e. it will
take 47 days to sell all of the
books.

$$\begin{array}{r} 46 \text{ r}3 \\ 4 \overline{) 187} \end{array}$$