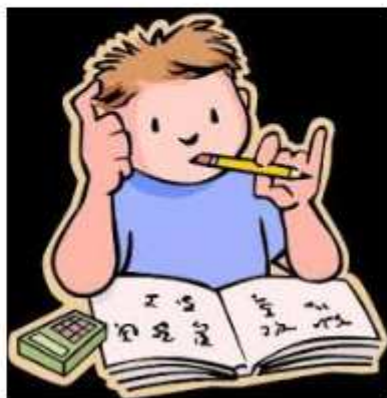


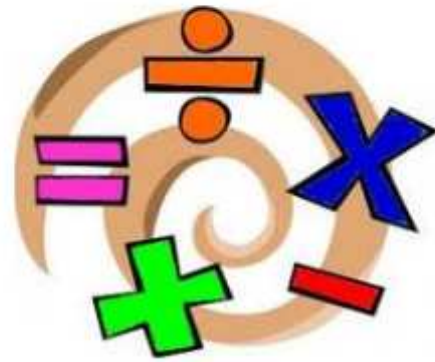
Helping your child with Maths at home



Aims

To show the methods used in school for each of the four operations

To demonstrate the progression between these methods



Addition

One way we teach children to add is to partition numbers and then recombine;

$$34 + 67$$

$$30 + 60 = 90$$

$$4 + 7 = 11$$

$$90 + 11 = 101$$

$$132 + 149$$

$$100 + 100 = 200$$

$$30 + 40 = 70$$

$$2 + 9 = 11$$

$$200 + 70 + 11 = 281$$

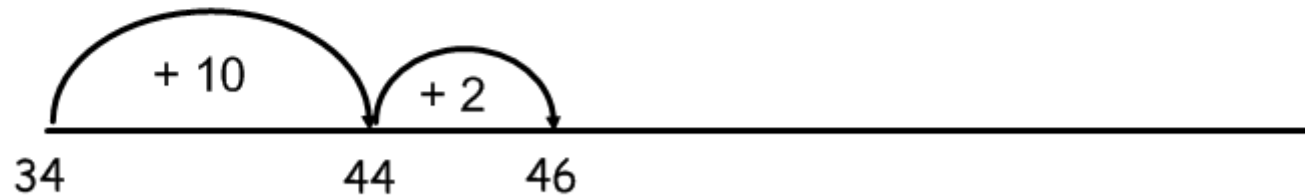
Addition on a numberline

The most commonly used method of adding used before children are ready to move on to column addition

$$34 + 12 = 46$$

10 \ 2

This is an optional step that can be dropped when the child is ready.

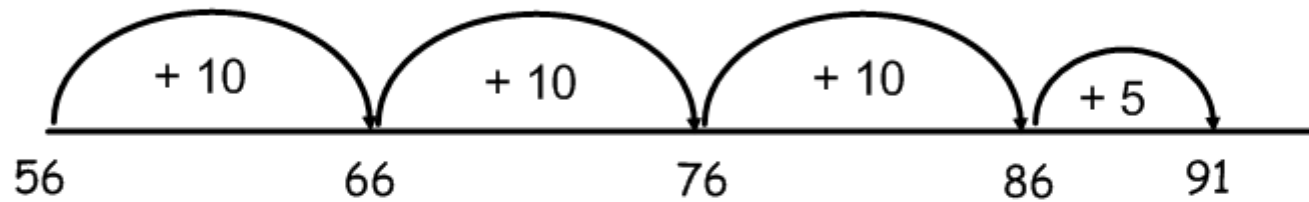


Progression

For sums such as $56 + 35$, children move from;

$$56 + 35 = 91$$

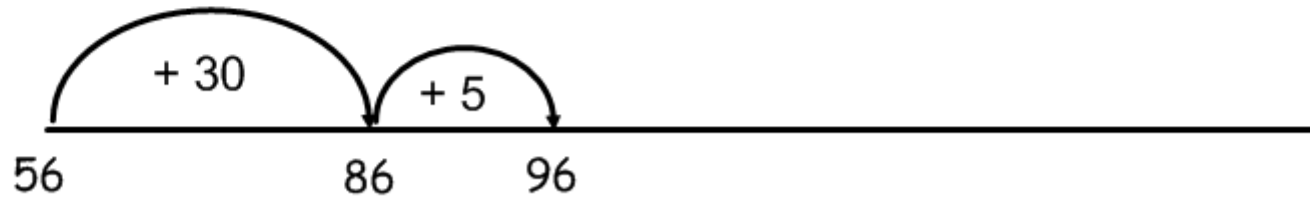
30 5



To;

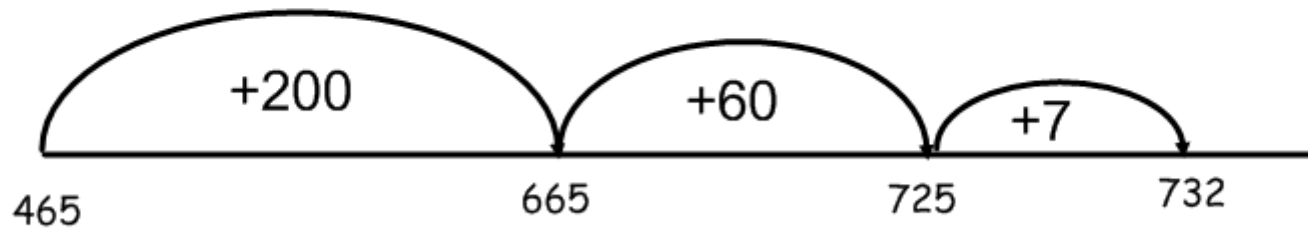
$$56 + 35 = 91$$

30 5



Numberlines can still be used successfully and efficiently for sums with larger numbers;

$$425 + 267 = 732$$



When children are ready they are moved on to column addition. To begin with, we use numbers that do not require the children to carry.

$$\begin{array}{r} 43 \\ + 24 \\ \hline 67 \\ \hline \end{array}$$

$$\begin{array}{r} 127 \\ + 341 \\ \hline 468 \\ \hline \end{array}$$

Next, we use numbers where the children are required to carry in one or more columns. We place our carried numbers in a circle underneath.

$$\begin{array}{r} 47 \\ + 35 \\ \hline 82 \\ \hline \textcircled{1} \end{array}$$

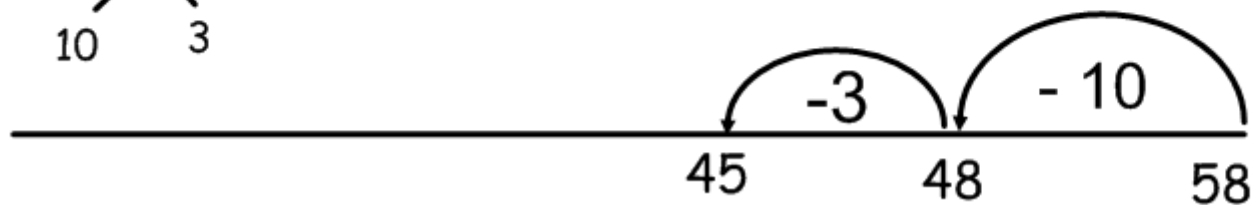
$$\begin{array}{r} 147 \\ + 366 \\ \hline 513 \\ \hline \textcircled{1} \textcircled{1} \end{array}$$

Subtraction

Follows a similar teaching progression to that of addition.
We begin on a numberline.

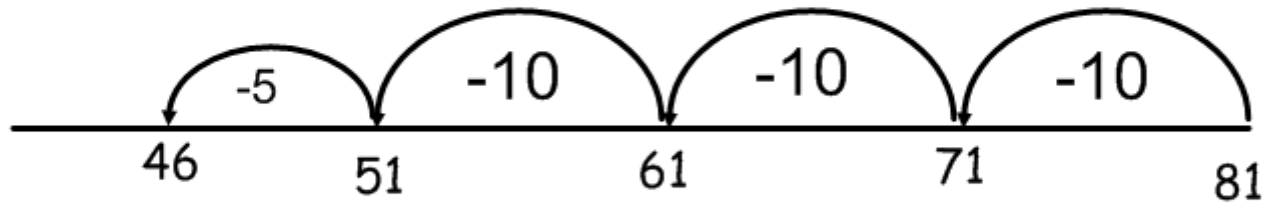
$$58 - 13 = 45$$

$$\begin{array}{r} \diagdown \quad \diagup \\ 10 \quad 3 \end{array}$$

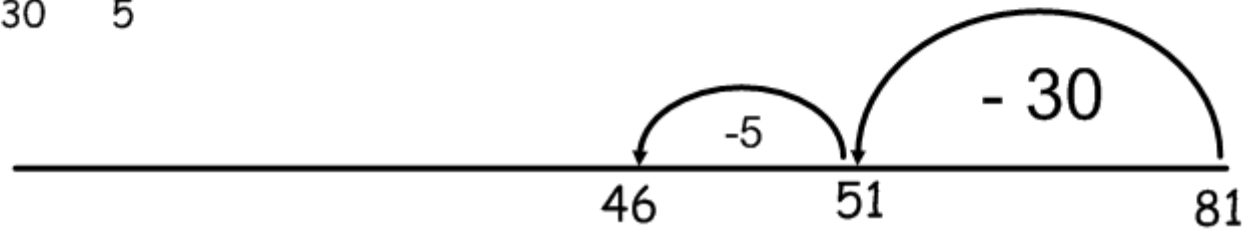


Progression: Similarly for subtraction we progress the children on a numberline until they are ready for column subtraction.

$$\begin{array}{r} 81 - 35 \\ \swarrow \searrow \\ 30 \quad 5 \end{array}$$



$$\begin{array}{r} 81 - 35 \\ \swarrow \searrow \\ 30 \quad 5 \end{array}$$



When children are ready, we move them on to the column method for subtraction. As with addition we begin by using numbers which do not require us to exchange.

$$\begin{array}{r} 56 \\ - 24 \\ \hline 32 \\ \hline \end{array}$$

$$\begin{array}{r} 278 \\ - 131 \\ \hline 147 \\ \hline \end{array}$$

The next step is to move children on to sums where they will need to exchange.
 Some children struggle to grasp this stage and should continue to use a
 numberline if necessary.

$$\begin{array}{r}
 5 \cancel{6}^1 2 \\
 - 34 \\
 \hline
 28 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 1 \cancel{2}^3 \cancel{4}^1 2 \\
 - 175 \\
 \hline
 67 \\
 \hline
 \end{array}$$

Children should be aware that even if they become proficient in using column subtraction, it is not always the most efficient method. If the numbers in the sum are close together, it will be easier to count on from the smallest number to the largest number. This can be done mentally or using a numberline. If the number that you are subtracting from has lots of zeros in, it may also be easier and quicker to use a numberline.

5004 - 4995. Is much more easily answered by counting on from 4995 to 5004.

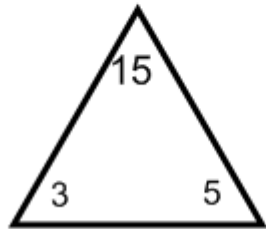
£5.00 - £1.25 is easier to answer when using a numberline.



Multiplication

Children should be aware that, just like addition and subtraction, multiplication and division are the opposite (inverse) of each other.

We teach the children to use this knowledge by finding 'Fact Families'



$$3 \times 5 = 15$$

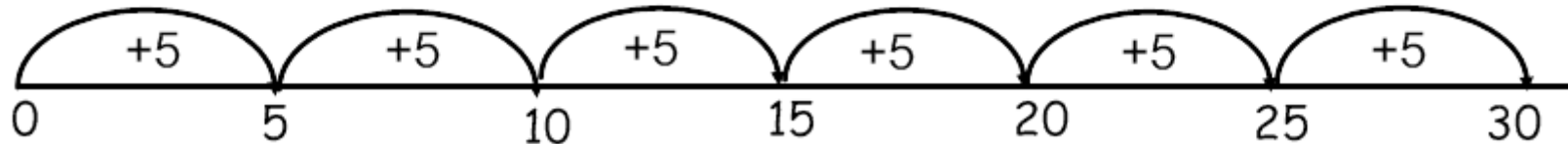
$$5 \times 3 = 15$$

$$15 \div 5 = 3$$

$$15 \div 3 = 5$$

When children are beginning to learn their times tables, we again use numberlines to show that multiplication is simply repeated addition.

6×5 means 6 lots of 5 = $5 + 5 + 5 + 5 + 5 + 5$



The grid method is the first written method for multiplication that children are shown. It works by partitioning the numbers.

$$\begin{array}{c} 14 \times 6 = 84 \\ \swarrow \quad \searrow \\ 10 \quad 4 \end{array}$$

	10	4
6	60	24

$$\begin{array}{r} 60 \\ + 24 \\ \hline 84 \end{array}$$

Children can either add mentally or use a method to add.

Progression: The grid method can be used successfully for many types of multiplication sums;

$$36 \times 3 = 108$$

	30	6	
3	90	18	$\begin{array}{r} 90 \\ + 18 \\ \hline 108 \\ \hline \textcircled{1} \end{array}$

$$162 \times 4 = 528$$

	100	60	2	
4	400	240	8	$\begin{array}{r} 400 \\ 240 \\ + \quad 8 \\ \hline 648 \end{array}$

$$56 \times 27 = 1512$$

	50	6
20	1000	120
7	350	42

$$\begin{array}{r} 1000 \\ 350 \\ 120 \\ + 42 \\ \hline 1512 \\ \hline \textcircled{1} \end{array}$$

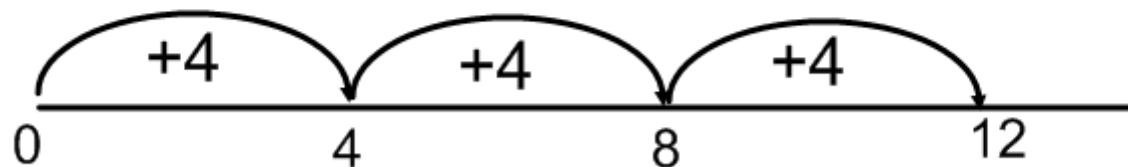
We show children the standard short and long multiplication methods.
Children move on to using these when they feel confident.

$$\begin{array}{r} 17 \\ \times 3 \\ \hline 51 \\ \hline 2 \end{array}$$

$$\begin{array}{r} 26 \\ \times 14 \\ \hline 104 \\ \hline 260 \\ \hline 364 \end{array}$$

Division: We encourage children to answer basic division questions using their times tables knowledge. This may be done mentally or on a numberline, as shown. To begin with we do not give children sums that will have remainders.

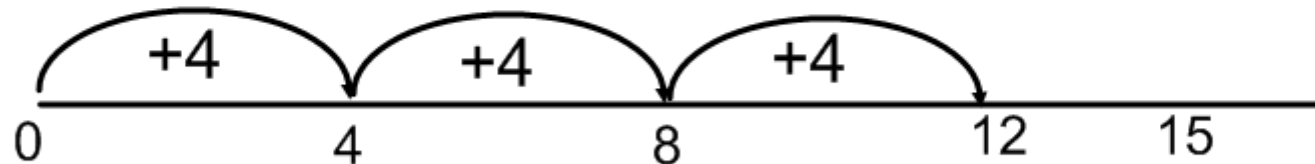
12 divided by 4 means; how many 4s go into 12?



We can see that we did 3 jumps of 4, so 12 divided by 4 = 3

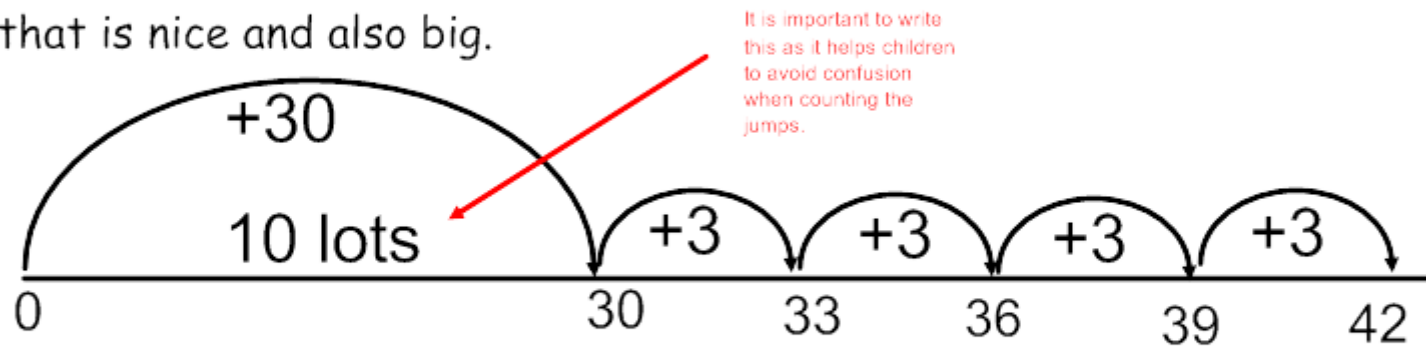
Remainders. When children have mastered the basics, we move on to division with remainders. Often this is done in practical situations first - children getting into groups, sharing out objects etc. It will then be modelled on a numberline

15 divided by 4 means; how many 4s go into 15?



We can see that we did 3 jumps of 4. We couldn't do a fourth jump because that would take us over 15. We are 3 away from 15. $15 \text{ divided by } 4 = 3 \text{ r } 3$

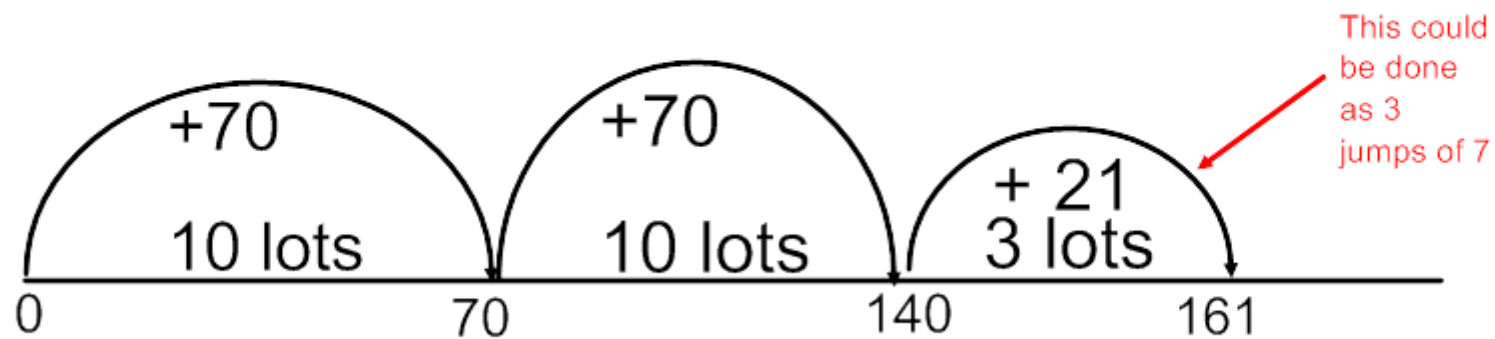
Bigger numbers. For sums such as 42 divided by 3, simply adding 3s will take a long time! I need to find a number in the 3 x table that is nice and also big.



$$42 \text{ divided by } 3 = 14$$

The more confident children are with their tables, the more efficient they will be with this method.

This method can also be used when there are remainders, in the same way as shown before. It continues to be efficient for larger numbers; 161 divided by $7 = 23$



Children will be shown the bus stop method for division too. Secure tables knowledge is required for children to use this method efficiently.

$$\begin{array}{r} 32 \\ 3 \overline{) 96} \end{array}$$

$$\begin{array}{r} 14 \\ 6 \overline{) 84} \end{array}$$

