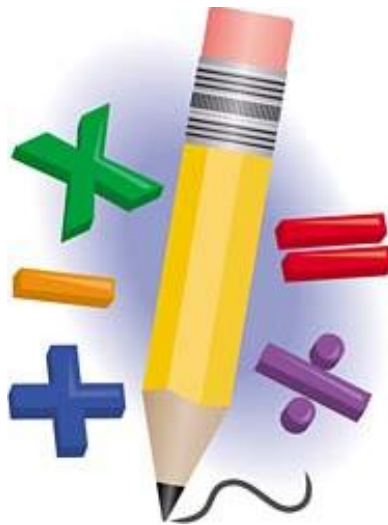




WESTHOLME INFANT SCHOOL

Progression in Calculations

Booklet for Parents



0 1 2 3 4 5 6 7 8 9

Looking at addition & subtraction

Children's addition and subtraction starts with lots of counting, talking about numbers and using numbers in real life activities. Children will be doing a daily mixture of practical, mental and oral work and they will learn how to record this. The ways in which they record will support their understanding and help them to visualise what they have done. This is a very important step and will aid them when they progress onto more formal recorded methods.

They will begin to record what they have done with pictures and numbers. These recordings will help them to understand what is happening and to show how they've worked something out. Here are two examples of early recording.

Jane had 3 bears. She was given 2 more. How many does she have now?

3 3 + 2 = 5 2.

There were 8 balloons. Two popped. How many are left?

8 - 2 = 6

This next example shows how different children have worked out and recorded the answer to the same problem about the children in the class.

There are 20 children in our class. Three are away today. How many are here?

17 here

2 away would be 18
so 3 away must be 17.

10 - 7 = 3
20 - 3 = 17

20 - 3 = 17

These diagrams and jottings help the children to see what is happening to the numbers and to use some facts they already know to help them work out others.

This progresses to using horizontal recording of addition and subtraction to support their mental calculations. The examples below show two ways of adding 43 and 26. The first example splits the numbers into tens and ones (units) then adds the tens followed by the ones to give 69. The second example shows using a blank number line; starting with the largest number and then adding the tens and ones from the second number.

In a school there are 43 boys and 26 girls. How many children are there altogether?

Example 1

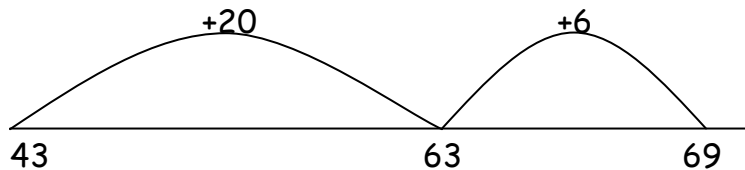
$$43 + 26 =$$

$$40 + 20 = 60$$

$$3 + 6 = 9$$

$$60 + 9 = 69$$

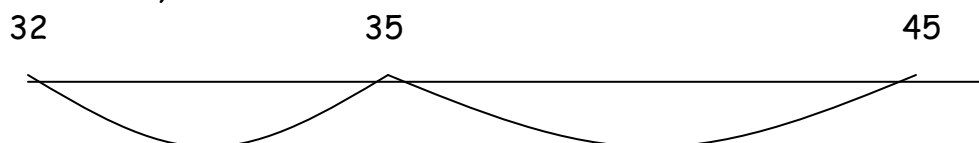
Example 2



For subtraction there are two ways of attempting a question which are often determined by the size of the numbers or the wording of a problem. In both examples you can see that children use a number line to support their thinking. The first example below shows using a blank number line to take away one number from the other, starting on the right with the larger number and counting back. The second example shows starting with the lower number and counting on to the larger number to find the difference between the two.

Example 1

There are 45 sweets in a jar and 13 are eaten by the children. How many sweets are left?

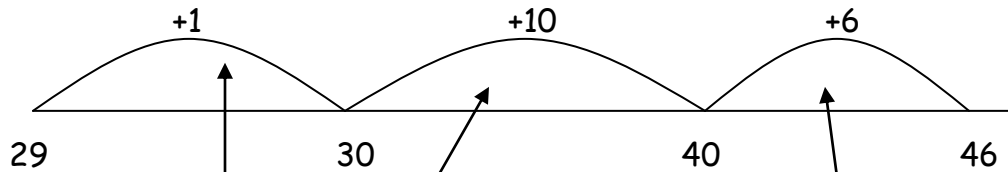


-3

-10

Example 2

One piece of rope is 46 metres long and the other is 29 metres long. How much longer is the first piece of rope?



In this method the children start on the left of the number line with the smallest number. They then jump to the next multiple of ten (referred to as the next 10) and record above the number line what the jump is. They jump in multiples of 10 until they reach the last tens number before the final number and record above the jump. They then jump to the final number and record the ones/units of the jump. The answer to the question is then found by adding up the jumps to find the total difference between the two numbers. So the answer is 17.

Once these foundations are established, children in Year Two will work towards being introduced to more formal methods of addition and subtraction including column (also known as vertical) addition and subtraction, without carrying.

Looking at multiplication & division

Did anyone ever tell you that you only needed to learn about half of the multiplication tables in order to know them all? If they didn't it was a bit mean because if you know $3 \times 4 = 12$ you also know $4 \times 3 = 12$, so why learn it twice?

In year 2 the children begin to learn times tables and the end of year expectation is that they know from memory the multiplication facts in the 10, 2 and 5 times tables.

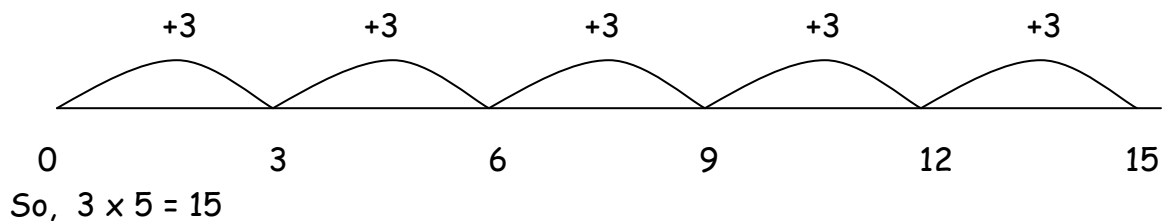
The early work children do in this area will introduce them to the ideas of multiplication and division. They will be counting in different patterns, helped to see how multiplication is repeated addition and shown how division is the opposite of multiplication.

In years 1 and 2 the children will be recording to demonstrate how they have done something and to show that they've understood what is happening, as below.

<p>2×3 cats = 6 cats or 3×2 cats = 6 cats</p>	<p>2 lots of 3 apples makes 6 apples.</p>	<p>$12 = 2 \times 6$ $9 = 3 \times 3$ $80 = 4 \times 20$</p> <p>$80 \div 4 = 20$ $80 \div 20 = 4$</p>

This then progresses to recording the repeated addition on a number line.

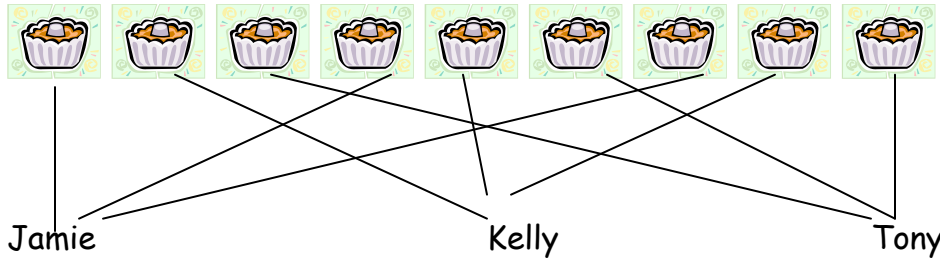
$$3 \times 5 = 3 + 3 + 3 + 3 + 3$$



In year two the children are introduced to the division sign \div and that it can mean sharing or grouping. The word problems below demonstrate a sharing and a grouping problem.

Sharing

The tray had 9 cakes in and they were shared out between Jamie, Kelly and Tony. Each child had the same number of cakes. How many did they have each?



So, $9 \div 3 = 3$

Grouping

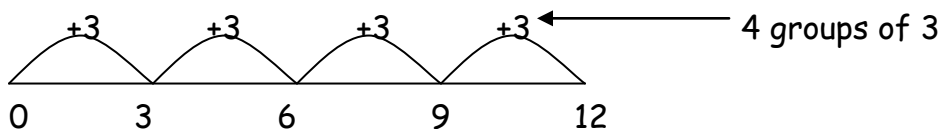
The apples need putting into bags with 5 apples in each bag. Julie has 15 apples. How many bags will she need?



So, $15 \div 5 = 3$

There is more of a focus on the grouping concept as this leads into the methods for working out division calculations later in the school and it shows how division is the inverse of multiplication. Once the children have had practical experience of grouping they will begin to work out how many groups of a number there are using a number line.

$12 \div 3$



So, $12 \div 3 = 4$