

Addition Mission

As methodology changes over time in terms of how we teach certain concepts in Maths, I thought it would be helpful to explain how we teach for understanding using concrete (physical resources) and visual representations (pictures) as per our calculation policy. I will focus on each of the number operations in turn, starting this week with **addition** in Key Stage 1. Next week we will explore how this progresses into Key Stage 2

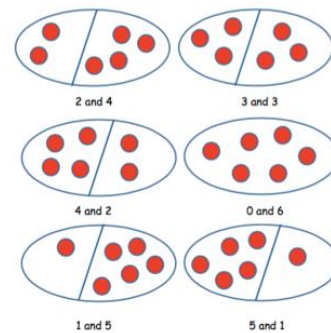
Reception Class

In Year R we tend to use the following vocabulary when teaching children to add: Part, whole, add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on.

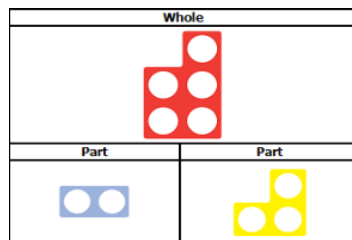
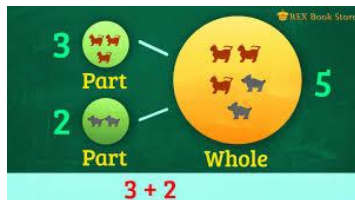
Children use Numicon to help them develop a mental representation of number and to compare numbers, saying what is one more or less



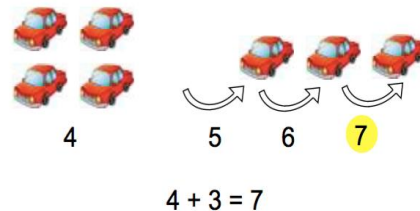
They use visuals to record calculations e.g. make 6...



They use part whole models to add e.g. 3 parts add 2 parts = 5 parts



- Use objects to add two single-digit numbers by counting on to find the answer.



They use 10 frames to represent numbers and to find totals to 10

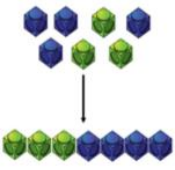
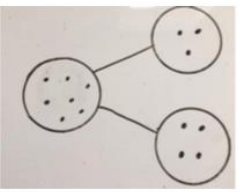
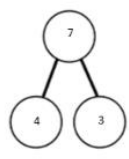
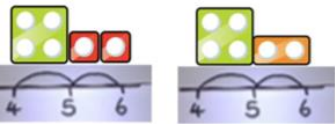
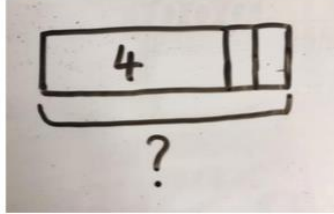
	$6 + 4 = 10$
	$4 + 4 = 8$
	$5 + 2 = 7$
	$2 + 4 = 6$

One of the best things you can do to prepare children for the mathematical world is to get them to subitise – to immediately recognise a number. We do this, for example, using dice. We immediately know that the number rolled is a 5, as we have experience of the arrangement of dots. Children in Year R need to recognise the value of numbers at speed.

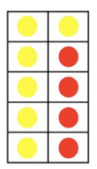
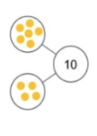
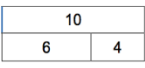
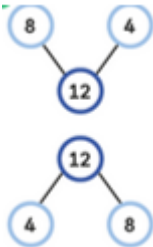
Year 1

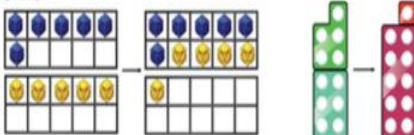
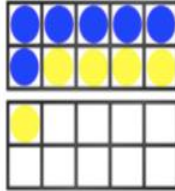
In Year 1 we tend to use the following vocabulary when teaching children to add: part, whole, addition, add, forwards, put together, more than, total, altogether, distance between, difference between, equals = same as, most, pattern, odd, even, digit, counting on.

The children are still taught how to use resources to aid their understanding, but move on to using visual representations that they or their teachers draw using working drawings e.g.

Combining two parts to make a whole (use other resources too e.g. eggs, shells, teddy bears, cars). 	Children to represent the cubes using dots or crosses. They could put each part on a part whole model too. 	$4 + 3 = 7$ Four is a part, 3 is a part and the whole is seven. 
Counting on using number lines using cubes or Numicon.  	A bar model which encourages the children to count on, rather than count all. 	The abstract number line: What is 2 more than 4? What is the sum of 2 and 4? What is the total of 4 and 2? $4 + 2$ 

Year 1 children learn the number bonds to 20 and their related number facts. To do this they use bar models, part whole models and 10 frames,,,

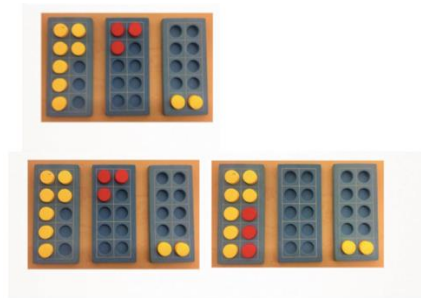
 $6 + 4 = 10$ $4 + 6 = 10$ $10 - 4 = 6$ $10 - 6 = 4$ Tens Frame	 $6 + 4 = 10$ $4 + 6 = 10$ $10 - 4 = 6$ $10 - 6 = 4$ Part Whole Model	 $6 + 4 = 10$ $4 + 6 = 10$ $10 - 4 = 6$ $10 - 6 = 4$ Bar Model	 Part whole models (like the ones immediately left) help children to create number sentences e.g. $8 + 4 = 12$ $4 + 8 = 12$ $12 - 8 = 4$ $12 - 4 = 8$
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Regrouping to make 10; using ten frames and counters/cubes or using Numicon. $6 + 5$ 	Children to draw the ten frame and counters/cubes. 	Children to develop an understanding of equality e.g. $6 + \square = 11$ $6 + 5 = 5 + \square$ $6 + 5 = \square + 4$
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Year 2

In Year 2 we tend to use the following vocabulary when teaching children to add: part, whole, +, add, addition, more, plus, make, sum, total, altogether, how many more to make...? how many more is... than...? how much more is...? =, equals, sign, is the same as, tens, ones, partition, near multiple of 10, tens boundary, more than, one more, two more... ten more...

Year 2 children use 10 frames and pictures to add three 3-digit numbers e.g. $7+3+2$

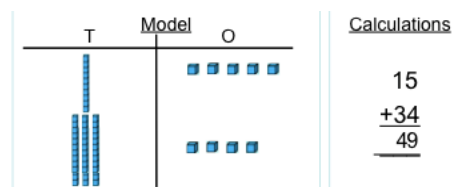


$$7+3+2 = \text{ leads to } 10 + 2 =$$

They use dienes apparatus (bars and ones) to add 1-digit and 2-digit numbers e.g.



This leads them to being able to add pairs of 2-digit numbers e.g.



Year 2 children can then use the same method to add pairs of numbers where an exchange is necessary e.g.

TO + TO using base 10. Continue to develop understanding of partitioning and place value. $36 + 25$	Children to represent the base 10 in a place value chart.	Looking for ways to make 10. $36 + 25 =$ 30 + 20 = 50 5 + 5 = 10 50 + 10 = 61 1 5 36 Formal method: $\begin{array}{r} 36 \\ +25 \\ \hline 61 \\ 1 \end{array}$
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You can see that when they are ready, they move from using the resources to drawing visual representations and then to abstract numbers (see pictures directly above (left to right)). If children move too quickly to the abstract or don't have experience of the resources they may not understand the maths behind the concept. This is where, as adults we can go wrong sometimes, as we forget the journey we made to get to our own understanding or were taught a procedure rather than actually understanding what is going on mathematically.

Anyway, I hope that you have found this insight into how we teach maths useful. Next week we will explore how we teach addition in Key Stage 2.

Mr Wheat