

# Chad Vale Primary School Calculation Policy

Addition





Children are encouraged to develop their understanding of mathematics using the CPA approach (Concrete - Pictorial - Abstract).

At Chad Vale, we feel that it is important that the abstract method is used alongside any concrete and pictorial representations whenever possible. This is to show children the relationship between both methods. As children progress through the calculation policy, it might be more appropriate for children to start on *pictorial* representations with concrete examples used for those who are struggling or need further support.

This document identifies the progression in calculation strategies rather than specifying which method should be taught in a particular year group. Therefore, children should only progress to the next stage when they are ready. The purpose of this policy is to develop understanding. For this reason, in the latter stages where more complex methods are adopted and where children are expected to be competent in certain skills (e.g. number bonds / times-tables), children are encouraged to move straight onto abstract methods as concrete and pictorial representations (e.g. long division) are not appropriate and likely to lead to confusion.

Examples of varied fluency are also included in this document which enable children to demonstrate a sound understanding. Teachers should always exercise discretion in their use as adopting new methods, with children who are not secure might again lead to confusion.

	Stage 1	CHAD. VALE SCHOOV	
	Concrete	Pictorial	Abstract
Counting in ones	Children explore counting using concrete materials.	Children count the number of printed items presented on a page which can't be moved.	Concrete materials are used alongside the correct numeral which might be printed or written.
Adding two amounts			
	Children add two amounts together which are then combined at the end.	Pictures are used and children add two groups together.	Children add using either objects and pictures alongside the correct numeral. This which might be written or printed.

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	Concrete	Pictorial	Abstract
Combining two parts to make a whole	5 + 2 = 7	4 + 2 = 6	What is? 8 + 3 = 11 7 + = 9
	Manipulatives are used to support the learning of addition alongside the correct notation. This supports the understanding of the abstract concept.	Pictorial representations are used alongside the number sentence.	Manipulatives / pictorial representations should still be used to support children with a calculation.
Re-grouping to make 10	Manipulatives are used to support the learning of numberbonds to ten alongside the correct notation.	7 + 2 = 9 Pictorial representations are used alongside the number sentence.	Numberbonds in orderNumberbonds out of order $1 + 9 = 10$ $2 + 8 = 10$ $3 + 7 = 10$ etc $4 + \_ = 10$ $7 + \_ = 10$ $5 + \_ = 10$ Children should learn and recite their numberbonds to 10 by rote.
unting in ones using a numberline	5+2=7	4 + 3 = 7 $13 + 3 = 1$ $13 + 3 = 1$	<ul> <li>Questioning might include</li> <li>What is the sum of 4 and 2?</li> <li>What is 2 more than 4?</li> <li>What is the total of 4 and 2?</li> </ul>
Col	Children <b>count on</b> from the first number and count in ones.	Children move onto number lines - counting in ones.	Children may still need to use a numberline in order to answer questions.

## Varied Fluency: Examples to support the understanding of addition (O+O)



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#### Varied Fluency: Examples to support the understanding of TO+ TO







	Concrete	Pictorial	Abstract
TO+ TO (building towers of ten)	The ones are added together and a 'tower of ten' is created. It is then carried into the tens column. Any remaining ones are left behind. Finally each column is then added together.	TOAs they are added together, ten ones are crossed off and a 'tower of ten' is then drawn in the tens column.TOZ7II<	+ $\begin{array}{ccc} 2 & 7 \\ 1 & 4 \\ \hline 4 & 1 \\ 1 \end{array}$ hildren use column addition, carrying the ew 'tower of ten' into the <b>tens</b> column.
TO+ TO (carrying towers of ten)	$ \begin{bmatrix} T & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0$	H       T       O         Image: Constraint of the state of	$ \begin{array}{c} 0 \\ 5 \\ 3 \\ 8 \\ \hline ne 'towers of ten' \\ sed off as they are ogether and one \\ I is then drawn in the drawn in the$









# Developing Mental Strategies for Addition



Whilst developing an understanding of addition, children should develop strategies to solve calculations mentally. The numberline and hundred square can be used in order to develop this further so that children become fluent at mental addition.



## Developing Mental Strategies for Addition



