Gossops Green Primary School

Overview of Strategies and Methods - Subtraction

At Gossops Green, we use the Concrete, Pictorial, Abstract method in our maths teaching. Children are simultaneously introduced to a maths concept using a range of concrete materials and equipment that they can physically manipulate, pictorial representations of a concept and more abstract ways of working. This allows for a deeper understanding of the skills and knowledge required to apply subtraction in different contexts. An overview of these for subtraction can be found below:

Subtraction

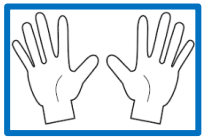
Concrete

Children are taught to use the following concrete resources (the list is not exhaustive):

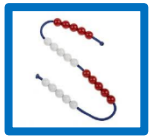
Multilink

Numicon

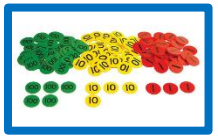
Everyday items



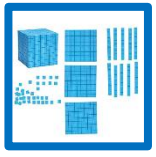
Fingers



Bead strings



Place Value counters

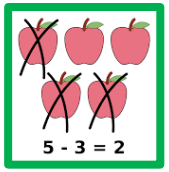


Dienes Base Ten

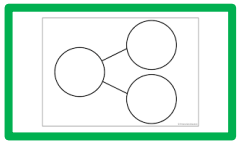
Tens Frames

Pictorial

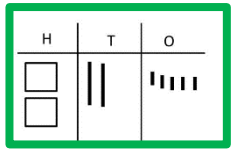
Children are taught to use the following pictorial representations to support their subtraction:



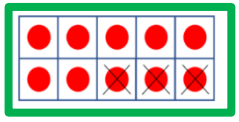
Drawings



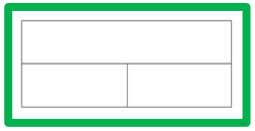
Part-Part-Whole



Drawing dienes

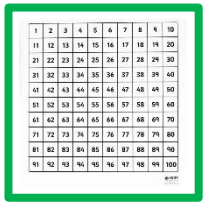


Drawing tens frames

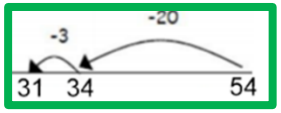


Bar Model

Drawing place value counters



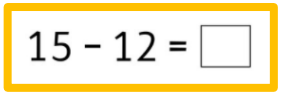
Hundred square



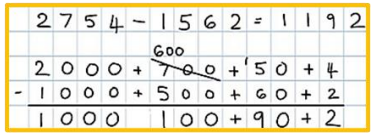
Number lines

Abstract

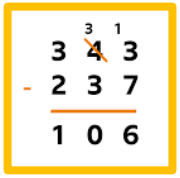
Children are taught to use the following abstract methods to record / solve subtraction calculations:



Use of – and = symbols

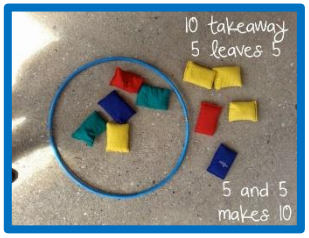
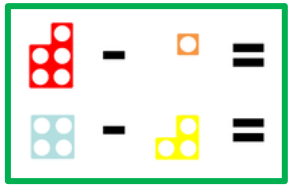
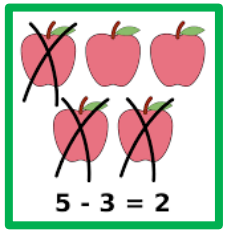
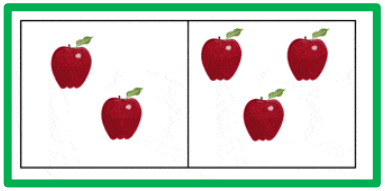


Expanded written method



Compact written method

Overview of Strategies and Methods - Reception – Subtraction

	Concrete	Pictorial	Abstract
	Children at the expected level of development will automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts)		
Subtraction	**Take Away** Children use a range of concrete apparatus to manually take away small numbers and then count up how many are left e.g.  **Finding the Difference** Children start to recognise whether one quantity is greater than, less than or the same as the other quantity. 	**Take Away** Children subtract using pictorial representations of numicon:  Children are taught to cross out pictures when they are taking away  **Finding the Difference** Children recognize which picture represents a bigger / smaller amount 	**Take Away** Using rote learning and repetition, children are taught to count back in 1s Children are taught to automatically recall subtraction facts to 5. They are introduced to the – and = symbols, although do not need to use these. **Finding the Difference** Children are taught to identify which of two numerals represents a bigger / smaller amount *children do not need to recognize the > sign

Overview of Strategies and Methods - Year 1 – Subtraction

Pupils should be taught to:

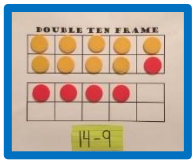
- read, write and interpret mathematical statements involving subtraction (−) and equals (=) signs
- represent and use number bonds and related subtraction facts within 20
- subtract one-digit and two-digit numbers to 20, including zero
- solve one-step problems that involve subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ? − 9

Subtraction

Concrete

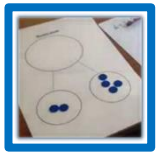
Take Away

Children use a wider range of concrete apparatus to physically take away a smaller amount from a larger starting amount including:



using tens frames and physically removing the counters

using bead strings, moving one bead at a time

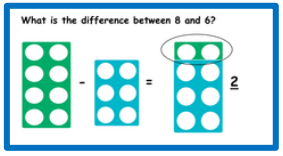


using the part-part-whole model, starting with concrete apparatus in the 'whole' and physically moving them to see what is left

Finding the Difference

Children use Numicon and multilink to compare two numbers and work out the difference

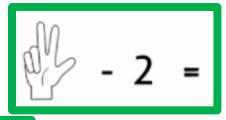
[Finding the difference by counting on - YouTube]

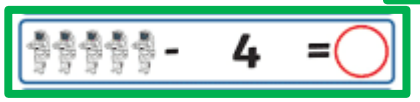


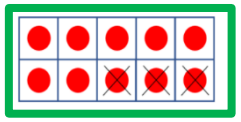
Pictorial

Take Away

Children use and draw pictures to show 'taking away' in a range of real-life concepts e.g.

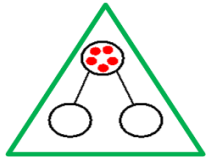


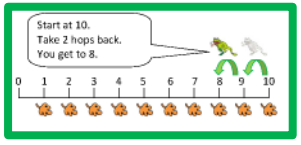




Children draw their own ten frames, or use pictorial representations and cross out the dots

Children use part-part-whole, representing the numbers as dots.

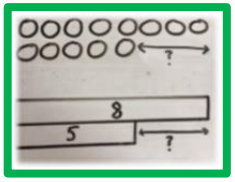




Children count back on a number line, starting from the largest number and taking away the smaller number, counting back in ones

Finding the Difference

Children start to draw representations in order to find the difference



Abstract

Children are taught to understand the meaning of the - and = signs. Calculations are written either side of the equal sign so that the sign is not just interpreted as 'the answer'.

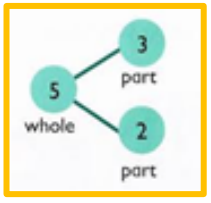
$$1 = 2 - 1$$
$$10 - 3 = 20 - 13$$

Children start to solve simple missing number calculations, where the missing numbers are placed in all possible places.

$7 - 4 = \square$ $\quad\quad$ $\square = 7 - 4$

$7 - \square = 3$ $\quad\quad$ $4 = 7 - \square$

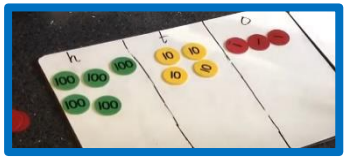
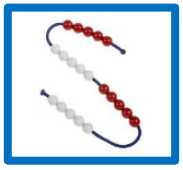
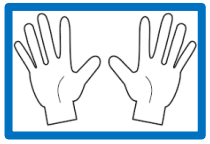
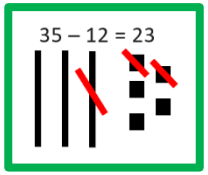
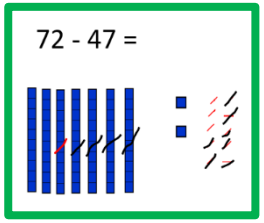
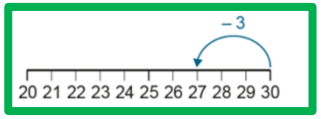
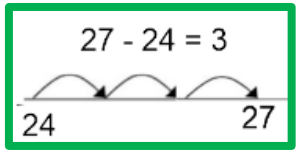
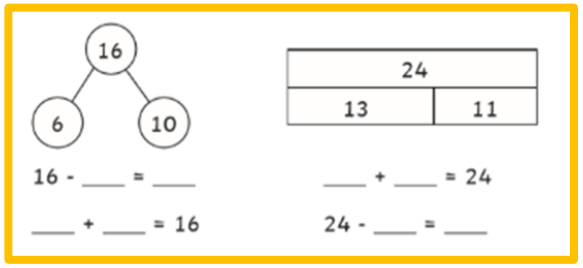
Children consolidate their understanding of the part, part, whole model by writing abstract numbers and finding the two possible subtraction calculations



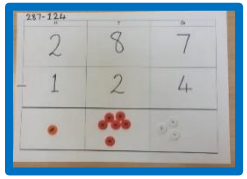
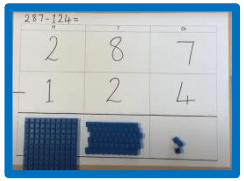
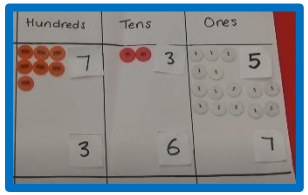
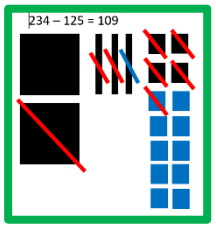
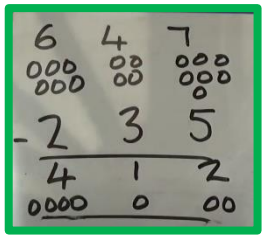
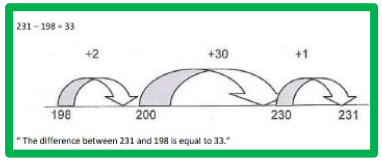
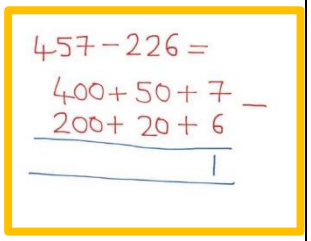
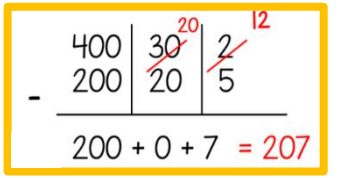
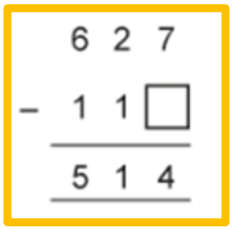
$5 - 3 = 2$

$5 - 2 = 3$

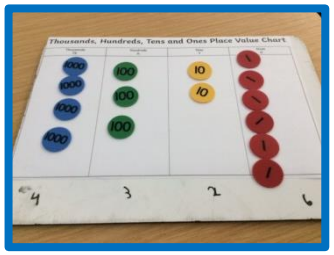
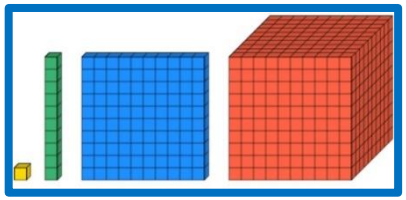
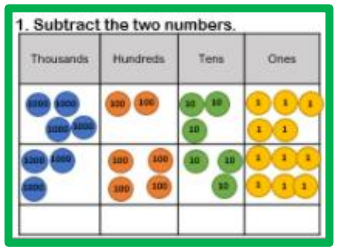
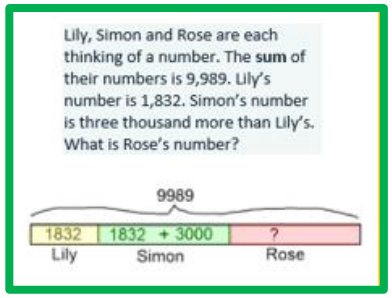
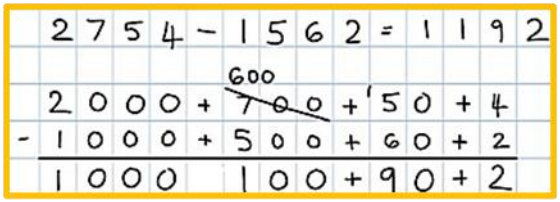
Overview of Strategies and Methods – Year 2 – Subtraction

	Concrete	Pictorial	Abstract
	Pupils should be taught to: • recall and use subtraction facts to 20 fluently, and derive and use related facts up to 100 • subtract numbers using concrete objects, pictorial representations, and mentally, including: two-digit numbers and 1s / two-digit number and 10s / 2 two-digit numbers		
Subtraction	**Take Away** Children start by subtracting numbers which do not cross ten. Children use dienes or place value counters to make 2-digit numbers and subtract and are taught how to substitute 1 ten for 10 ones. Subtraction using Dienes - YouTube  Children use 100 bead strings, subtracting one bead at a time or in groups of 10  **Finding the Difference** Children start to find small differences, less than 10, between two numbers, using their fingers 	**Take Away** Children draw dienes to represent a 2-digit number and then strike through the number they are subtracting, discovering what is left,  starting with numbers that do not cross 10  and moving onto those that do Children are taught to count back on number lines and on 100 squares, moving up a row when subtracting 10  **Finding the Difference** Children are taught to find a small difference (within 10) by counting on, using a number line or a number square 	**Take Away** Children develop their understanding of the Part-Part-Whole and Bar Models by finding all four related calculations (Addiiton and subtraction)  **Finding the Difference** Children start to recognise when 2 numbers are close together e.g. 54 – 49 =

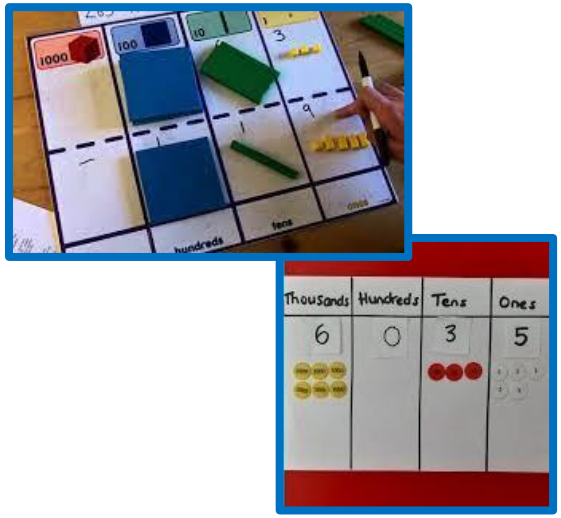
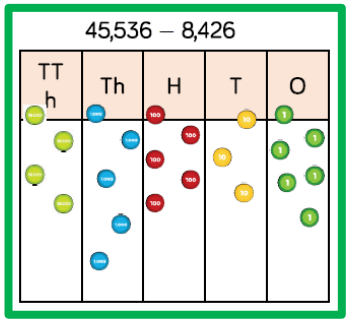
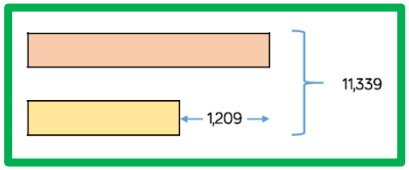
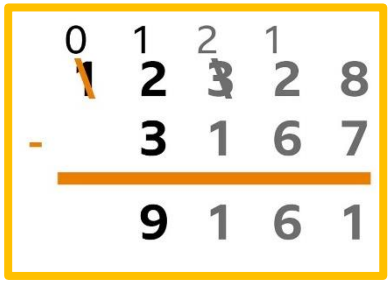
Overview of Strategies and Methods - Year 3 – Subtraction

	Concrete	Pictorial	Abstract
	Pupils should be taught to: • subtract numbers mentally, including a three-digit number and ones, a three-digit number and tens, a three-digit number and hundreds • subtract numbers with up to three digits, using formal written methods of columnar subtraction		
Subtraction	**Take Away** Children use the resources to subtract a 3-digit number from a 3-digit number, starting with no exchanging Using dienes: Column subtraction - Base 10 - 3 digits (no exchanging) - YouTube Or using place value counters: Column subtraction - Place Value Counters - 3 digits (decimal and money context) - YouTube  Children progress to subtracting a 3-digit number from a 3-digit number, including exchanging:  KS2 - how to subtract using Dienes cubes - YouTube Or using place value counters: Column subtraction of 3 digit numbers using place value counters - with and without exchanging - YouTube 	**Take Away** Children draw dienes or place value counters to solve calculations in the same way as they would use the concrete resources:   **Finding the Difference** Children find a small difference by drawing a number line and counting up, particularly when the number being subtracted is close to a hundred e.g.  Children are taught to use appropriate jumps, using their number bonds to help them. Children are taught to interpret bar models to help them solve subtraction problems 	**Take Away** Children start to use the expanded column method, starting with no exchanging   And movin onto exhanging Children are also exposed to missing number calculations, presented in compact form  **Finding the Difference** Children start to recognise when 2 numbers are close together, including bridging a hundred and work out the answer mentally e.g. 605 – 599 =

Overview of Strategies and Methods – Year 4 – Subtraction

	Concrete	Pictorial	Abstract
	Pupils should be taught to: • subtract numbers with up to 4 digits using the formal written method of columnar subtraction where appropriate		
Subtraction	**Take Away** Children extend their understanding of using dienes or place value counters to subtract, including thousand cubes / counters  	**Take Away** Children draw dienes or place value counters to solve calculations in the same way as they would use the concrete resources:  **Finding the Difference**  Children are shown how to use and draw Bar Models to represent subtraction problems	**Take Away** Children extend the expanded column method to 4-digit numbers  Some may start to use compact written method **Finding the Difference** Children recognise when 2 numbers are close together, including bridging a thousand and work out the answer mentally e.g. 6005 – 5999 =

Overview of Strategies and Methods – Year 5 and 6 – Subtraction

	Concrete	Pictorial	Abstract
	Pupils should be taught to: • subtract whole numbers with more than 4 digits, including using formal written methods (columnar subtraction) (Y5) • subtract numbers mentally with increasingly large numbers (Y5) • perform mental calculations, including with mixed operations and large numbers (Y6) • solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why (Y6		
Subtraction	**Take Away** Children consolidate their understanding of column subtraction using dienes or place value counters. 	**Take Away** Children draw dienes or place value counters to solve calculations in the same way as they would use the concrete resources:  **Finding the Difference** Children are presented with subtraction calculations in a variety of different formats. E.g. 	**Take Away** Children consolidte their understanding of column subtraction and extend the method to numbers with more than 4-digit numbers, including exchanging: