Bradley Primary School

Subtraction Calculation Policy

Written October 2022

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This policy has been adapted from the White Rose Calculation Policy with additional material added.

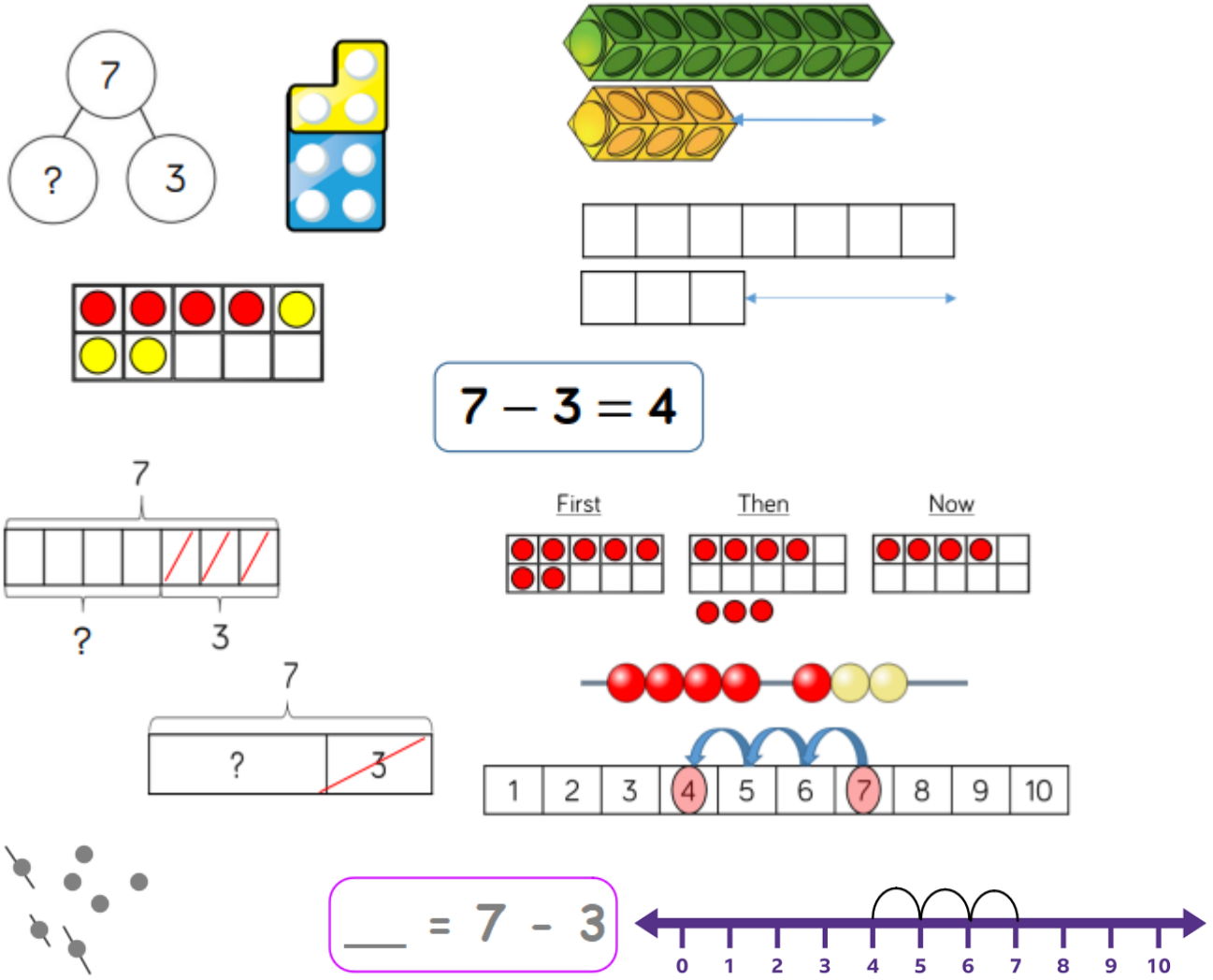
This policy is written in line with the National Curriculum (2014) expectations and it should be used to support children in developing a deep understanding of number and calculation. It works alongside our school vision of mastery for mathematics. We aim for children to become confident and fluent mathematicians. Children should progress through the stages working towards formal written methods (where appropriate). After a method has been taught, children should be able to make their preferred choice for the most appropriate, efficient and accurate method for them. Previous strategies may need to be revisited to consolidate understanding when introducing a new strategy. As each new strategy is introduced, children should have the opportunity to explore them, alongside methods they are secure with, to make connections and identify the similarities and differences.

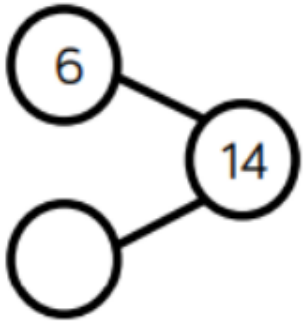
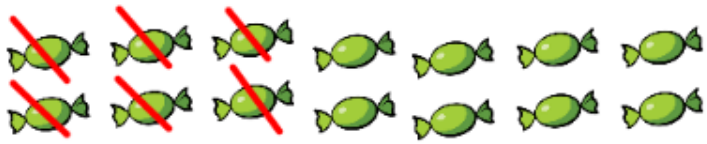
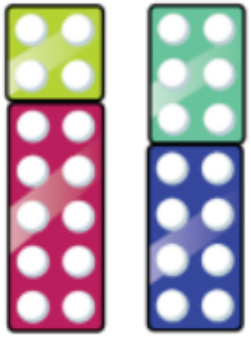
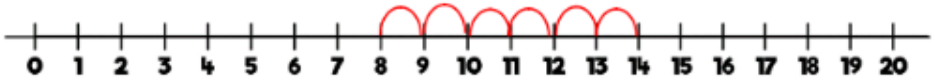
Concrete, Pictorial, Abstract (CPA) Approach

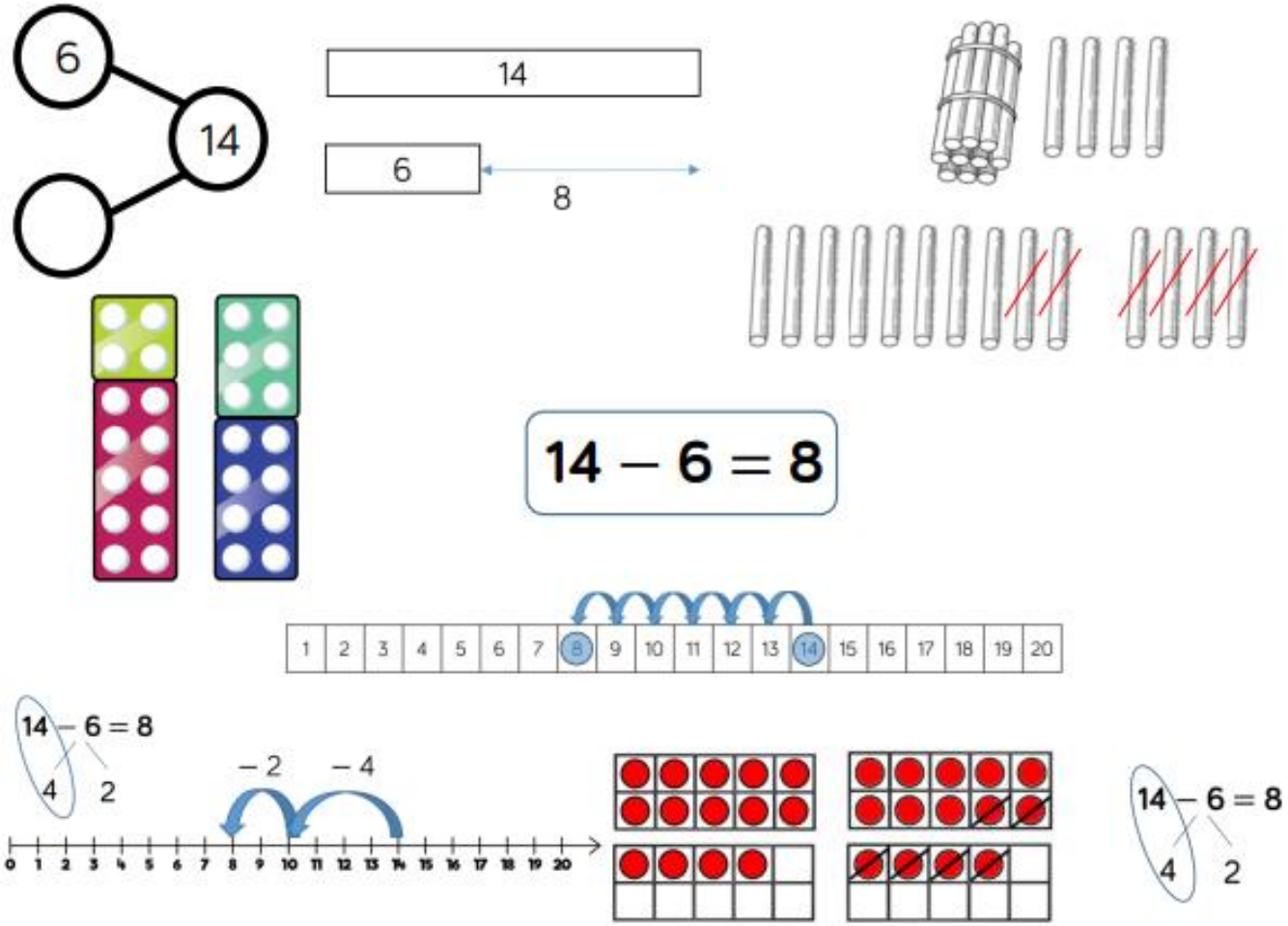
Children of all ages are first introduced to new mathematical learning by using real objects (concrete resources). They are offered a 'hands on' experience with manipulatives to support their fundamental knowledge as a foundation for their conceptual understanding. This is then followed by a pictorial representation which reflects the concrete manipulatives previously used. The children then make connections between the concrete resources and the pictorial representations. After sufficient foundation knowledge is gained, the pupils move onto an abstract representation using mathematical notations. To begin with, this concept is used parallel with the pictorial and concrete representations to secure the children's knowledge of all procedures. These skills are reinforced through all representations being used throughout school, irrespective of the year group.

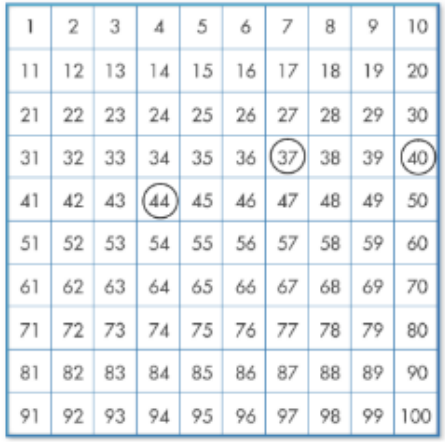
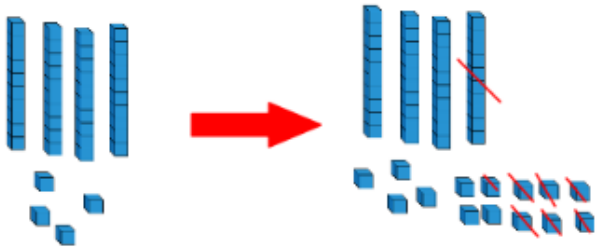
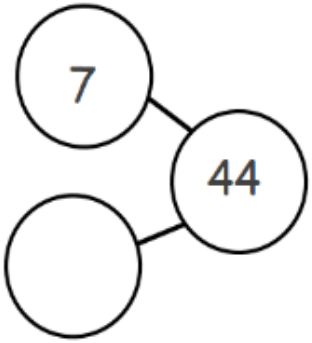
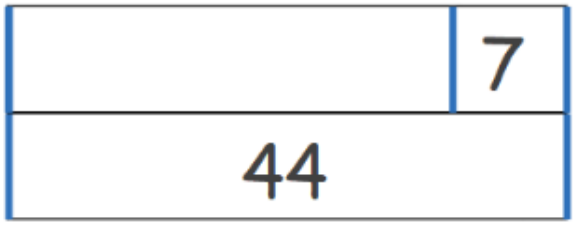
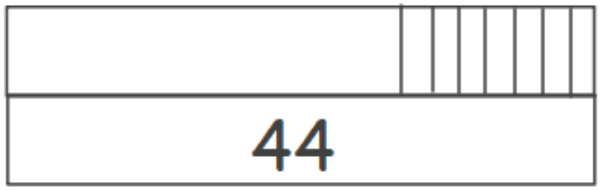
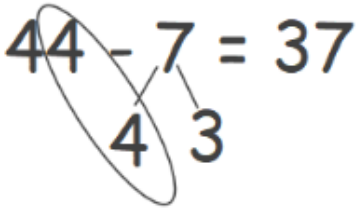
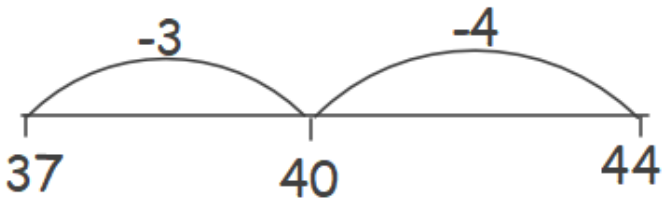
Reasoning and Problem Solving

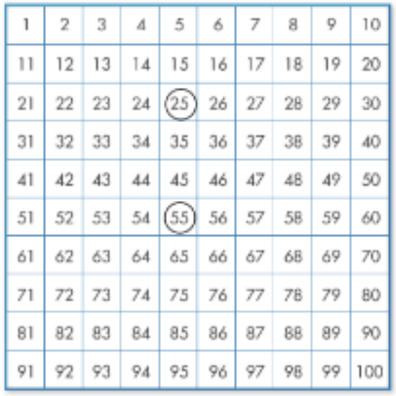
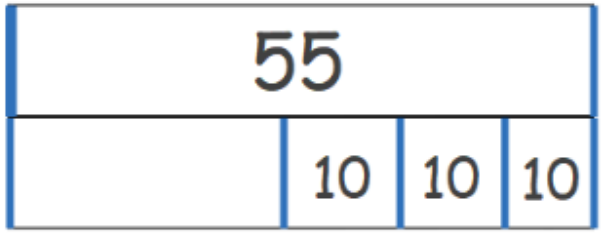
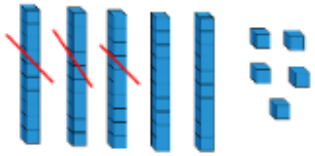
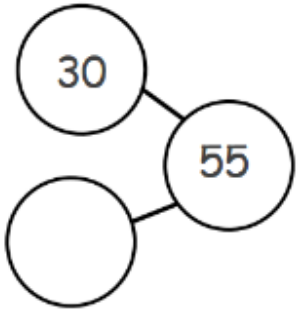
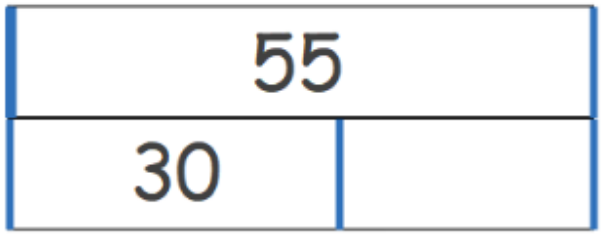
Children are regularly exposed to reasoning and problem solving questions to embed their understanding of the skills gained within a topic. They use their learning in real-life contexts to solve complex and abstract problems, considering skills gained in previous areas of learning.

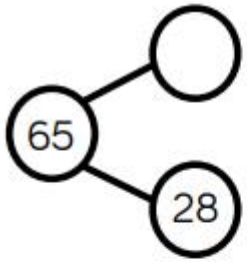
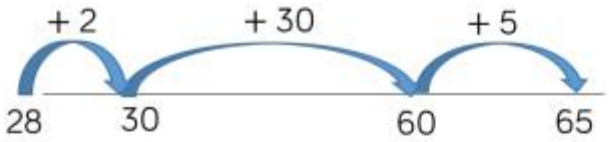
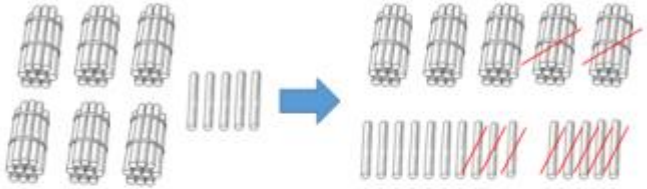
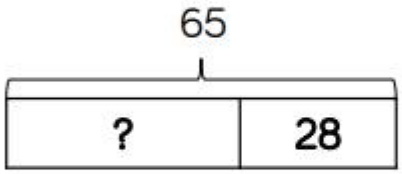
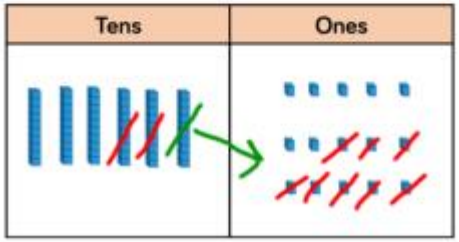
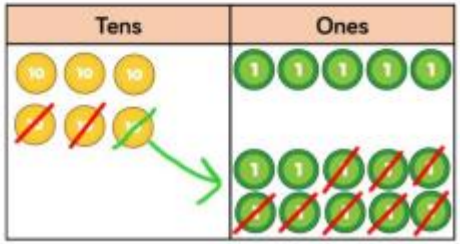
Year 1		
To subtract numbers within 10		Part whole models, ten frames and Numicon support partitioning. Ten frames, number tracks and lines, single bar models and bead strings support reduction. Cubes and bar models with 2 bars can support finding the difference.

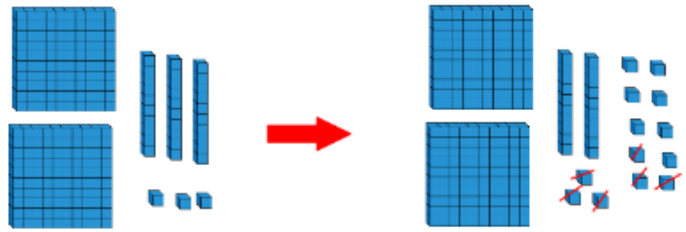
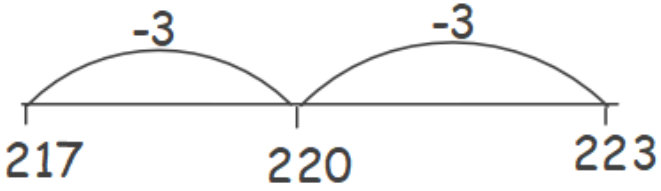
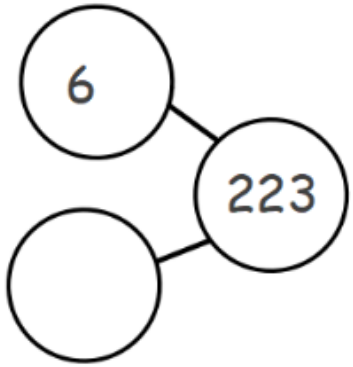
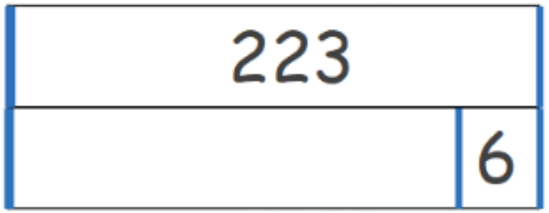
To subtract numbers within 20.	 $14 - 6 = 8$    	In Year 1, subtracting one-digit numbers that cross 10, is done by counting back, using objects, number tracks and number lines.

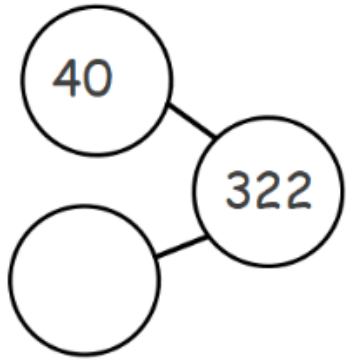
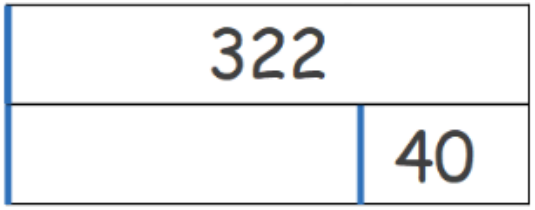
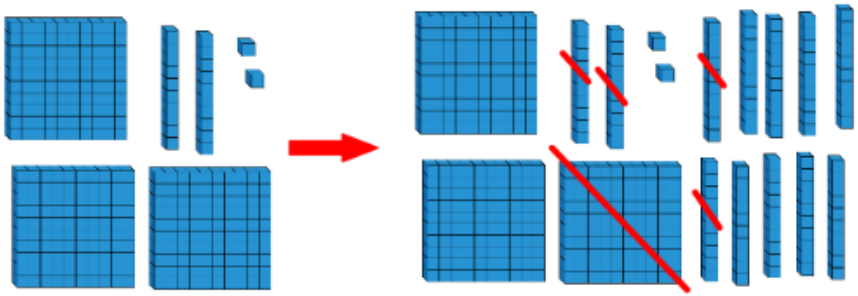
Year 2		
To subtract a 2 digit number and ones (within 20).		Children should now be encouraged to find the number bond to 10 when partitioning the subtracted number. Ten frames, Numicon and number lines are the most useful manipulative for this progression.

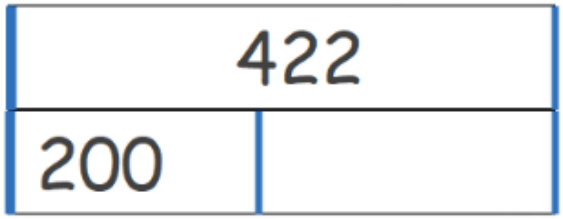
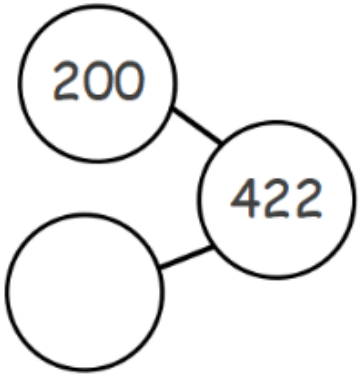
To subtract a 2 digit number and ones (within 100)	  44 - 7 = 37      	Children should continue to look for the number bond to the nearest multiple of ten and count back when subtracting a 1 digit number. Counting back on a blank number line can be used for children when subtracting a ones number.

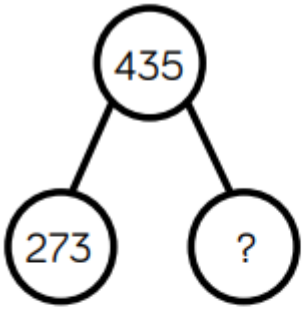
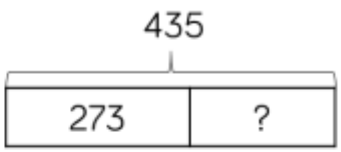
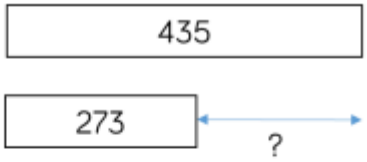
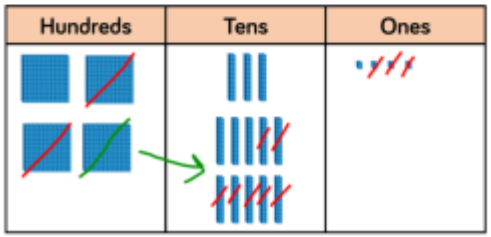
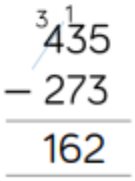
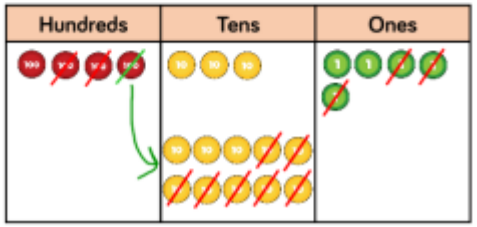
To subtract a 2 digit number and tens.	  55 - 30 = 25    55 - 30 = 25 20	Children should apply their use of partitioning and number bonds. 5 - 3 = 2 so 5 tens - 3 tens = 2 tens so 55 - 30 = 25 Some children may need to count back in tens orally to support their understanding.

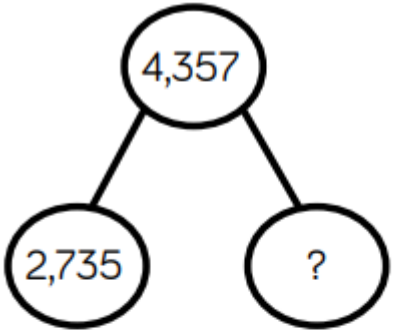
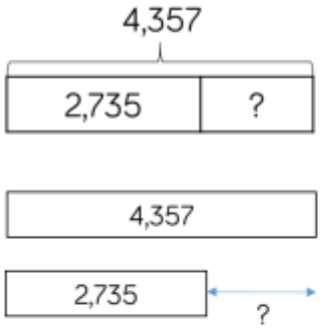
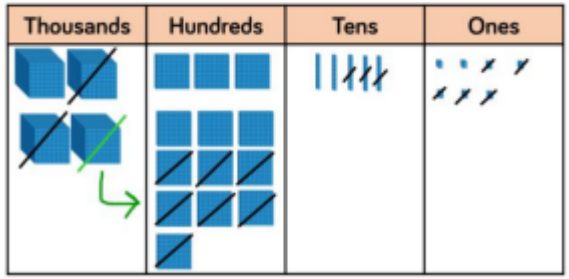
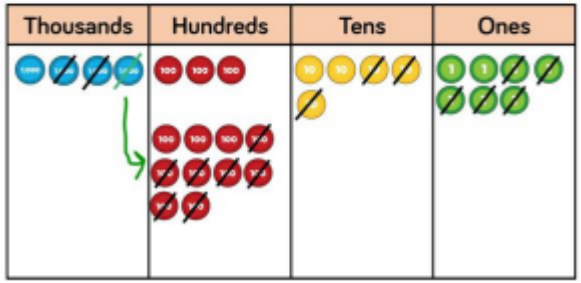
To subtract two 2 digit numbers.	    $65 - 28 = 37$  	Children can also use a blank number line to count back to find the difference. They should be encouraged to jump in multiples of 10 to become more efficient . Children should work towards the pictorial representation of the written method.

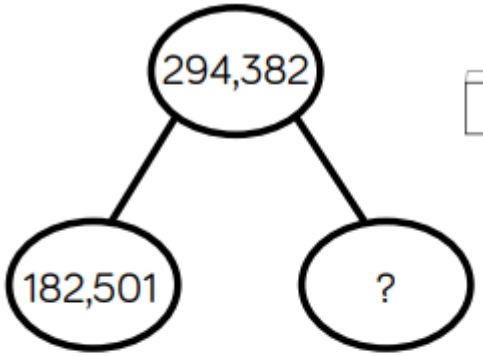
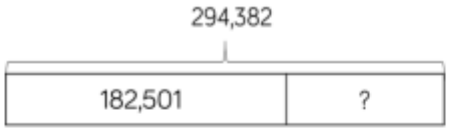
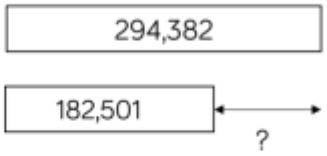
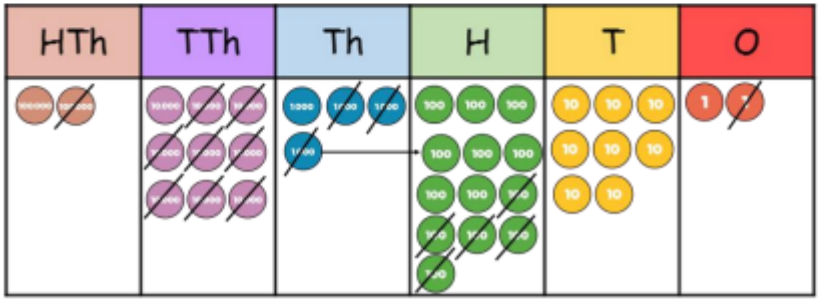
Year 3		
To subtract a 3 digit number and ones.	 223 + 6 = 3 3  223 - 6 = 217   	When subtracting a single digit from a 3 digit number children should identify if it crosses the 10s boundary. A mental method using number bond knowledge should be used if it doesn't cross the boundary. Place value or plain counters on a place value grid can also be used to develop understanding.

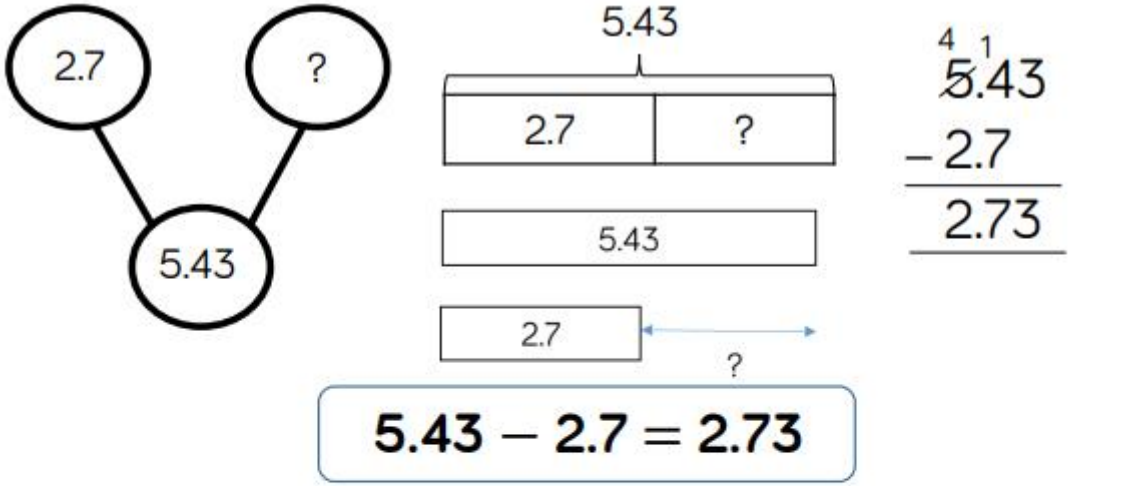
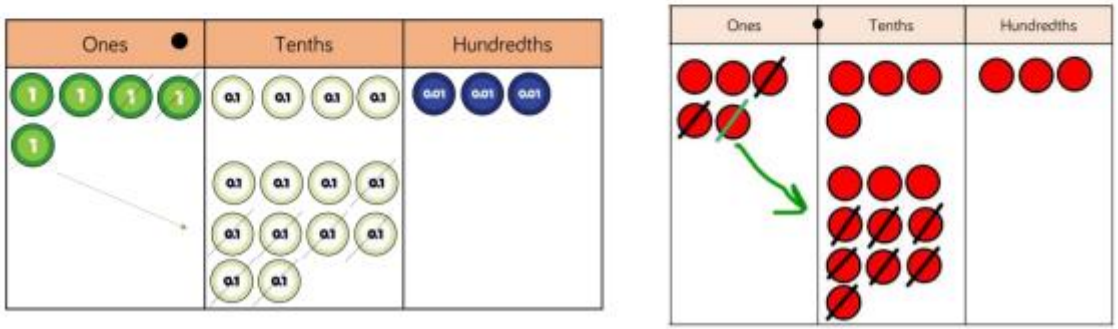
To subtract a 2 digit number and tens.	  322 - 40 = 282 20 20 322 - 40 = 282 	When adding a tens number to a 3 digit number children should identify if it crosses the 100s boundary. A mental method using number bond knowledge should be used if it doesn't cross the boundary, or a simple line jotting using partitioning of the tens number. Place value or plain counters on a place value grid can also be used to develop understanding. Some children may need to count in tens orally to support their understanding.

To subtract a 3 digit number and a hundreds number.	____ = 422 - 200   	When subtracting a hundreds number from a three digit number children should identify which column is changing and apply their number bonds knowledge using a mental method, where appropriate. Some children may need to count in hundreds orally to support their understanding. A blank number line could also be used, where appropriate. This is especially useful when finding the difference.

To subtract numbers with up to 3 digits.	   **435 − 273 = 162**   	Base 10 and place value counters are the most effective manipulatives when subtracting numbers with up to 3 digits. Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method. Plain counters on a place value grid can also be used to support learning. Children should assess the calculation to ensure they are choosing the most efficient method. The default method should not be written column method.

Year 4		
Children should continue to work on the year 2 and 3 calculations (numbers with up to 3 digits). They should be encouraged to apply mental strategies to these calculations, where appropriate.		
To subtract numbers with up to 4 digits.	  3 1 4357 − 2735 1622 **4,357 − 2,735 = 1,622**  	Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method. Children should assess the calculation to ensure they are choosing the most efficient method. The default method should not be written column method. Plain counters on a place value grid can also be used to develop understanding. The same methods used for whole numbers should be applied for decimal numbers with one place.

Year 5/6		
To subtract numbers with more than 4 digits.	   294,382 − 182,501 = 111,881  	Place value counters or plain counters on a place value grid are the most effective concrete resources for subtracting numbers with more than 4 digits. At this stage children should be encouraged to work in the abstract using the column method to subtract larger numbers efficiently. However, children should always assess the question to ensure that the written method is the most efficient method.

To subtract numbers with up to 2 decimal places Year 6 To subtract numbers with up to 3 decimal places	 	Place value counters and plain counters on a place value grid are the most effective manipulative when subtracting decimals with 1, 2 and then 3 decimal places. Ensure children have experience of subtracting decimals with a variety of decimal places. This includes putting this into context when subtracting money and other measures.