

Calculation Journey

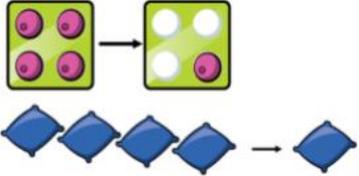
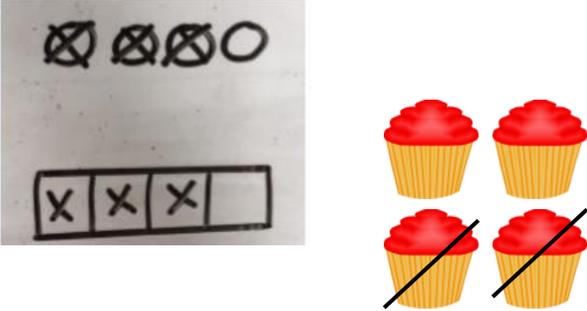
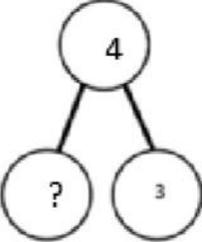
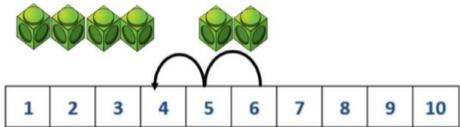
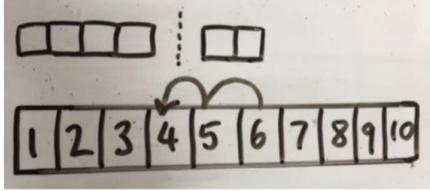
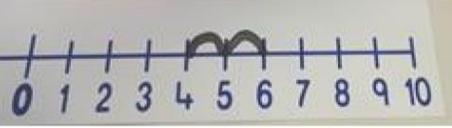
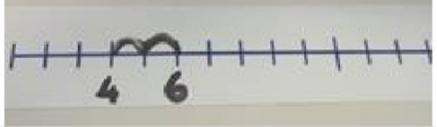
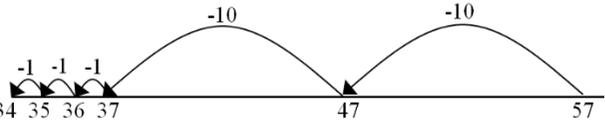
Subtraction

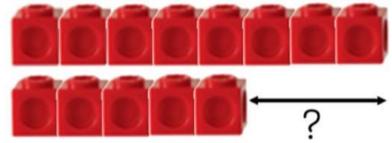
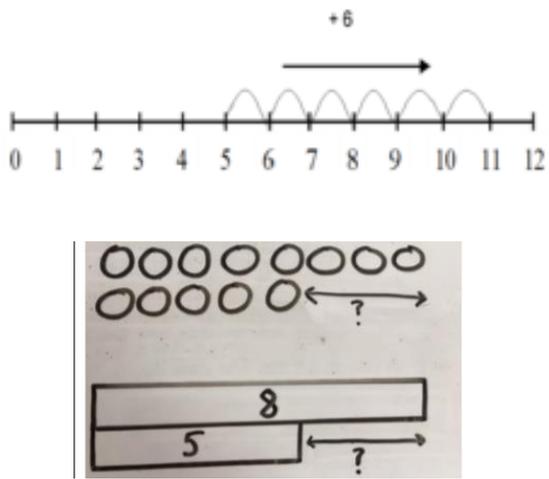
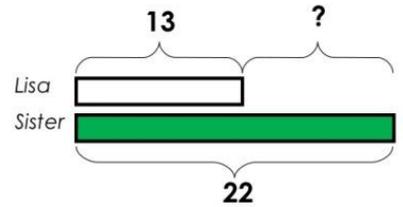
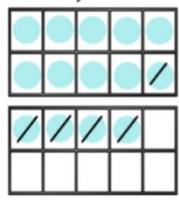
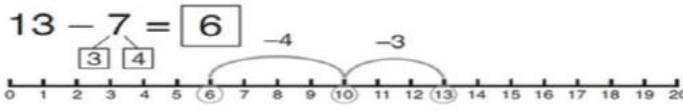
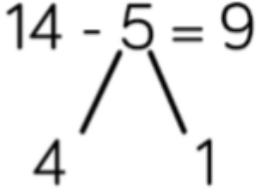
September 2021



Concrete	Pictorial	Abstract
<p>We begin every new skill with the use of concrete apparatus. This can include counter, cubes, beads, Numicon, base 10 etc. This helps children to visualise the numbers and understand the process clearly.</p>	<p>Next, we use drawings and models to show a pictorial version of the concrete apparatus used.</p>	<p>Finally, the children are confident enough to apply their knowledge to an abstract written method including numbers and symbols. They can then apply this to problem solving.</p>
<p>Reasoning at every level</p>		

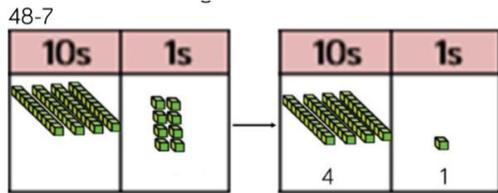
Subtraction key language: take away, less than, the difference, subtract, minus, fewer, decrease

	Concrete	Pictorial	Abstract
Taking away ones	<p>Physically taking away and removing objects from a whole (Numicon, ten frames, cubes, objects).</p> 	<p>Draw the concrete objects or use pictures and cross out the amount that is being taken away. You can also use a bar model.</p> 	<p>$4 - 3 =$</p> <p> $= 4 - 3$</p>  
Counting back	<p>Counting back using cubes on a number line or bead string.</p> <p>$6 - 2 = 4$</p>  	<p>Draw a number line to count back on.</p>  	<p>Use a blank number line and apply to simple word problems.</p>  <p>This can progress up to counting back 2 digit numbers.</p> 

Find the difference	<p>Compare amounts and objects to find the difference (using cubes, Numicon etc.)</p> 	<p>Draw the concrete objects or use a number line to find the difference (by counting forward).</p> 	<p>Apply skills to word problems using the bar model to support.</p> <p>Lisa is 13 years old. Her sister is 22 years old. Find the difference in age between them.</p> 
Making 10	<p>Use ten frames.</p> $14 - 5 =$  <p>Make 14 on the ten frame. Take away the four first to make 10 and then takeaway one more so you have taken away 5. You are left with the answer of 9.</p>	<p>Represent the ten frame in picture form.</p>  <p>Take away on a number line.</p> 	<p>Children show that they can make 10 by partitioning.</p> $14 - 5 = 9$  $14 - 4 = 10$ $10 - 1 = 9$

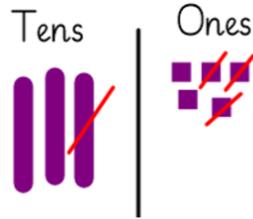
Column method (without regrouping)

Use base 10 or place value counters to begin to take away in columns.

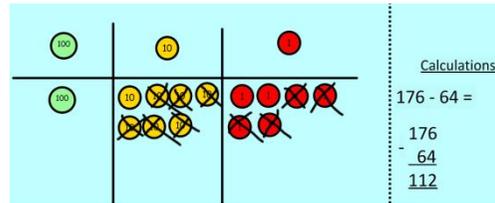


Draw the base 10 pictorially and cross out the number that they are subtracting.

$$35 - 13 = 22$$



Reinforce place value so the children understand that it is 30 - 10 and not 3 - 1.

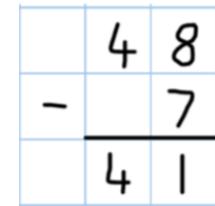


If needed, partition the number to reinforce 40 - 20 instead of 4 - 2.

$$47 - 24 = 23$$

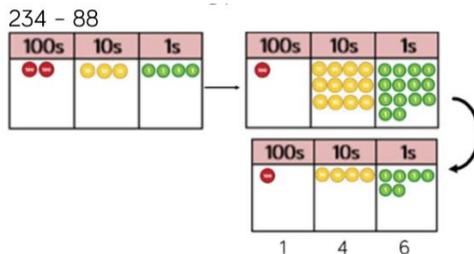
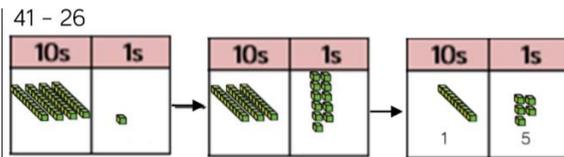
$$\begin{array}{r} 40 + 7 \\ - 20 + 4 \\ \hline 20 + 3 \end{array}$$

Simple written column method.

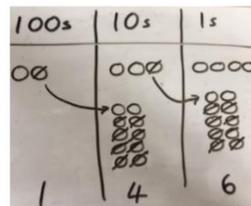
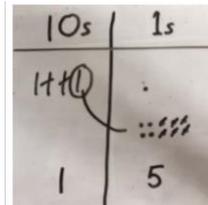


Column method (regrouping)

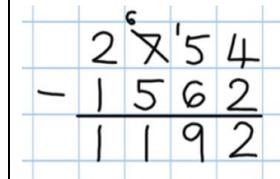
Column method using base 10 or place value counters. Children to learn how to exchange 1 ten for 10 ones.



Represent the base 10 or place value counters pictorially and show the exchange.



Formal column method. Children need to understand what happens when they cross out the digits. Children can still use the partitioned column method if needed (as shown above).



Apply this method to any numbers, including decimals.

$$\begin{array}{r} 5 \quad 12 \quad 1 \\ 2 \quad \cancel{6} \quad \cancel{3} \quad . \quad 0 \\ - \quad 2 \quad 6 \quad . \quad 5 \\ \hline 2 \quad 3 \quad 6 \quad . \quad 5 \end{array}$$