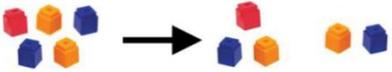
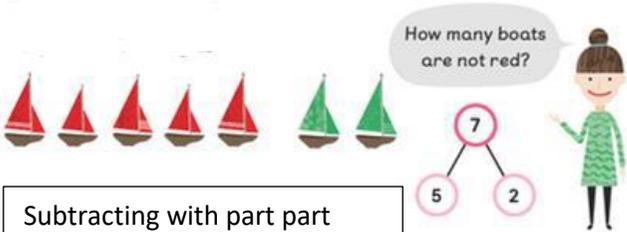
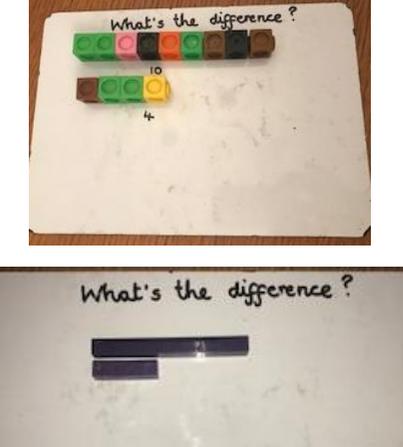
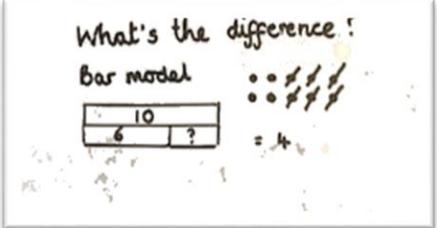


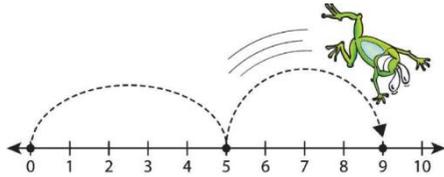
St Michael's Mathematics Progression Document using 'Concrete Pictorial & Abstract'
SUBTRACTION

MATHEMATICAL LANGUAGE strategy	CONCRETE	PICTORIAL	ABSTRACT Use the equals sign both ways
<p>Subtract Taking ones away One less Fewer</p> <p><u>Examples</u> "I have 5 whole ones. I take away 3 parts of the whole or 3 ones. I have 2 ones left." "2 is the difference between 5 and 3"</p>	<p>Taking away should begin with physical objects: objects, beads, cubes, Base 10 etc</p>   	<p>Taking away by crossing out</p>   <p>Subtracting with part part whole.</p>	<p>$15 - 3 = 12$ $12 = 15 - 3$</p> <p>$7 - 5 = 2$ 2 boats are not red.</p>

MATHEMATICAL LANGUAGE strategy	CONCRETE	PICTORIAL	ABSTRACT Use the equals sign both ways
<p>Find the Difference</p> <p>Comparison model</p> <p>= is the same as</p>	<p><u>Build towers</u> to find the difference.</p> <p>What's the difference between in age between a ten year old and a four year old?</p> 	<ul style="list-style-type: none"> Use a comparison model to find the difference  <p>Use a bar model</p> 	<p>Children draw number lines or own bar models to find the difference.</p> <p>As children become more confident they would draw subtraction calculations.</p>

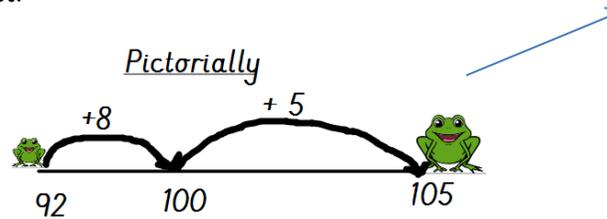
'froggy always jumps!'

Could use a toy frog to demonstrate jumping on a number line



CONCRETE

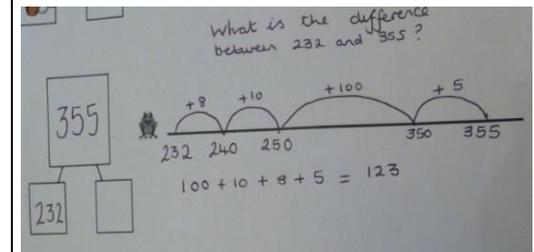
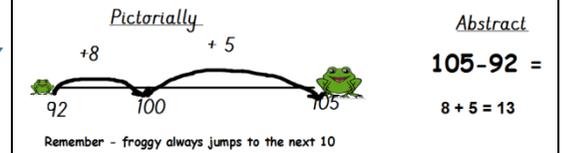
Use a number line using 'froggy'
What is $105 - 92$? Always count up to the next ten first.

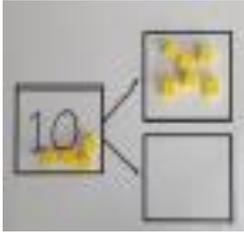
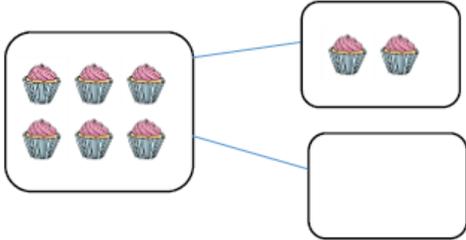
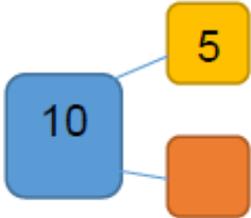
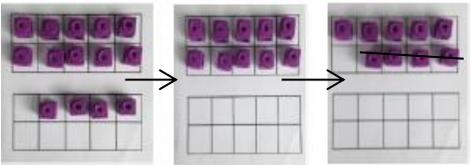
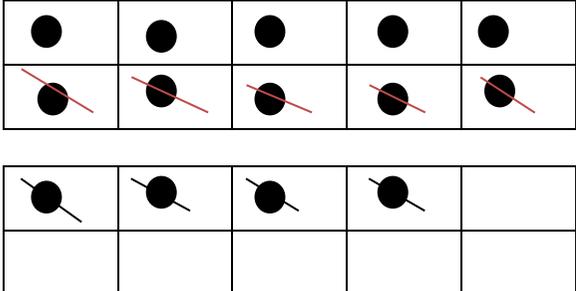


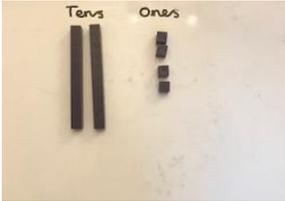
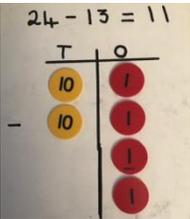
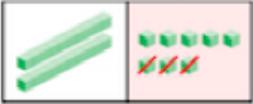
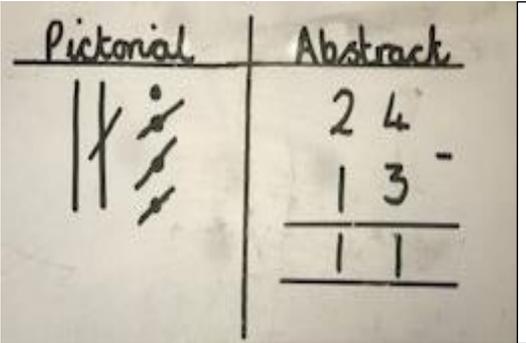
Remember - froggy always jumps to the next 10

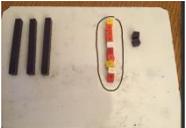
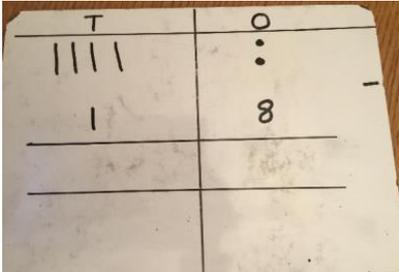
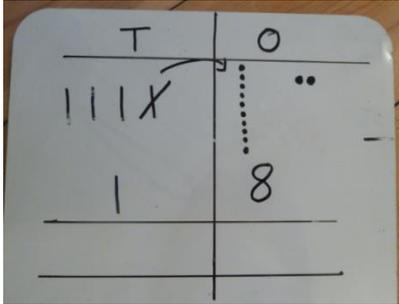
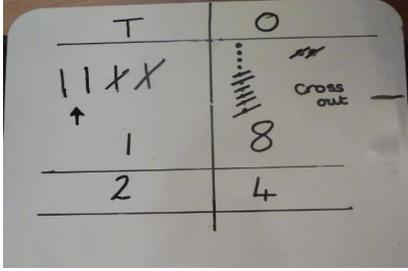
$8 + 5 = 13$. So the difference is 13.

Another examples with 3 digit numbers



MATHEMATICAL LANGUAGE strategy	CONCRETE	PICTORIAL	ABSTRACT
<p>Part Part Whole Model</p> <p>"If 10 is the whole and 5 is one of the parts. What is the other part?"</p>	<p>Link to addition- use the part whole model to help explain the inverse between addition and subtraction.</p> 	<p>Use a pictorial representation of objects to show the part part whole model</p> 	<p>Move to using numbers within the part whole model</p> 
<p>Using a ten's frame... Make 10</p> <p>"the difference between 14 and 9 is 5"</p>	<p>14-9 Make 14 on the ten frame. Take away 4 first to leave 10 and then count 5, 6, 7, 8 9. I have taken away 5 more because $4 + 5 = 9$ I am left with the answer of 5.</p> 	<p>14-9 Draw 14 on the tens frame. Take away 4 by crossing them out. Then cross out 5 more so you have taken away 9 altogether. The answer = 5</p> 	<p>$14 - 9 = 5$</p> <p>(How many do we take away to reach the next 10? If I take away 4 , I know I need to take away another 5 because $4 + 5 = 9$)</p>

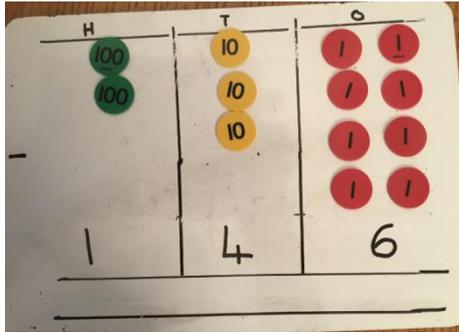
MATHEMATICAL LANGUAGE strategy	CONCRETE	PICTORIAL	ABSTRACT														
<p>Column method without regrouping</p> <p><i>Very important for children to use base ten equipment along with a place value chart to support.</i></p>	<p>Use of base 10/straws/counters to take away</p>   	<p>Draw the Base 10 or place value counters alongside the written calculation to help to show working.</p> <p>Subtract the ones. 8 ones - 3 ones = 5 ones</p>   	<p>1. No exchange first. When teaching the abstract. You could ask the child for a pictorial representation after to prove their understanding. Eg.</p> <table border="1" data-bbox="1563 491 2078 746"> <thead> <tr> <th>Pictorial (prove it)</th> <th>Abstract</th> </tr> </thead> <tbody> <tr> <td></td> <td> <table style="margin-left: auto; margin-right: auto;"> <tr><td>T</td><td>O</td></tr> <tr><td>2</td><td>8</td></tr> <tr><td>-</td><td>3</td></tr> <tr><td colspan="2"><hr/></td></tr> <tr><td colspan="2">5</td></tr> </table> </td> </tr> </tbody> </table> <p>2. Introduce partitioned column subtraction method. Eg.</p> $47 - 24 = 23$ $\begin{array}{r} 40 + 7 \\ - 20 + 4 \\ \hline 20 + 3 \end{array}$	Pictorial (prove it)	Abstract		<table style="margin-left: auto; margin-right: auto;"> <tr><td>T</td><td>O</td></tr> <tr><td>2</td><td>8</td></tr> <tr><td>-</td><td>3</td></tr> <tr><td colspan="2"><hr/></td></tr> <tr><td colspan="2">5</td></tr> </table>	T	O	2	8	-	3	<hr/>		5	
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T	O																
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MATHEMATICAL LANGUAGE strategy	CONCRETE	PICTORIAL	ABSTRACT
<p>Column method with regrouping</p> <p>Language used: Regroup Exchange</p> <p>Remember to teach one exchange before moving onto subtractions with 2 exchanges.</p>	<p>Use base 10 to start with before moving onto place value counters.</p>  <p>$20 - 4 = 16$</p> <p>$42 - 18 =$ Start with one exchange</p>  <p>Start with 42</p>  <p>Exchange base 10 for ten ones</p>  <p>Now take away the eight ones and one ten.</p> <p>What are you left with?</p>	<p>Step 1. $42 - 18 =$</p>  <p>Step 2. Exchange base 10 for ten ones</p>  <p>Step 3. Take away the ones first by crossing out and then the tens to get the final answer</p> 	<p>When confident, children show their own way of recording the exchange/regrouping</p>  <p>Children can start their formal method by partitioning the numbers into clear place value columns... moving towards a more compact method.</p> $ \begin{array}{r} \text{T} \quad \text{O} \\ 42 - 18 \\ \hline 24 \end{array} $ <p>Children can start their formal</p>

With two exchanges

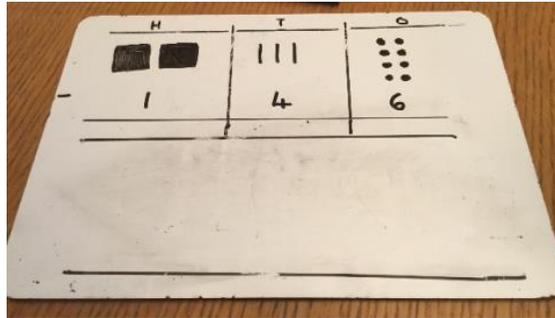
Remember to teach one exchange before moving onto subtractions with 2 exchanges.

$$238 - 146 =$$



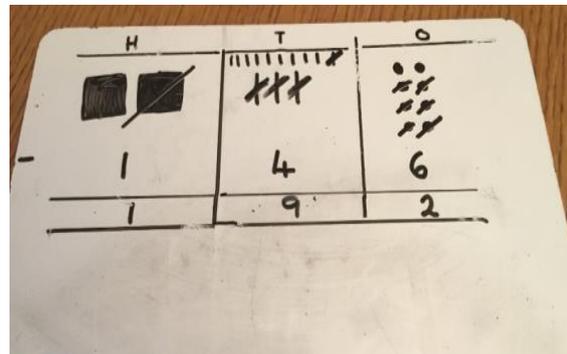
Step 1. $238 - 146 =$

Draw the pictures on the place value grid.



Step 2.

Show what you have taken away by crossing ones and clearly showing the exchanges you make from the hundred.



method by partitioning the numbers into clear place value columns...

$$\begin{array}{r} 238 - 146 = 92 \\ \hline \overset{100}{200} + \overset{30}{30} + 8 \\ - \overset{100}{100} + \overset{40}{40} + 6 \\ \hline 0 + 90 + 2 \end{array}$$

moving towards a more compact method.

$$\begin{array}{r} \text{H T O} \\ 238 - \\ \underline{146} \\ \hline \end{array}$$

Expanded method

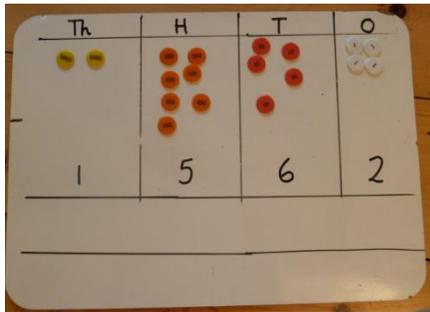
Subtraction
with
thousands

With thousands

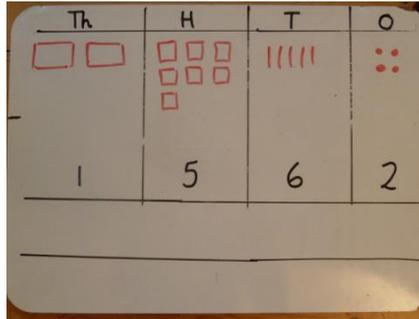
Use base ten before moving onto place value counters.



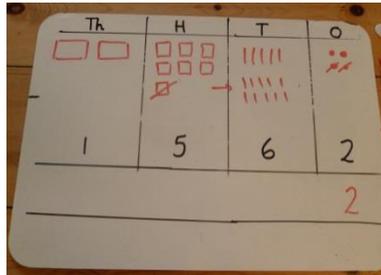
2754 - 1562



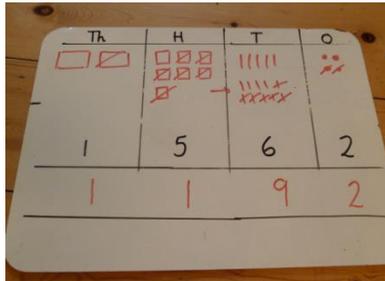
2754 - 1562



Cross out as you subtract the numbers.
Exchange the hundred for 10 tens (see below.)



Continue subtracting by crossing out until you get the answer.



$$2754 - 1562 = 1192$$

$$2000 + \overset{600}{\cancel{700}} + 50 + 4$$

$$- 1000 + 500 + 60 + 2$$

$$1000 + 100 + 90 + 2$$

Moving to compact method...

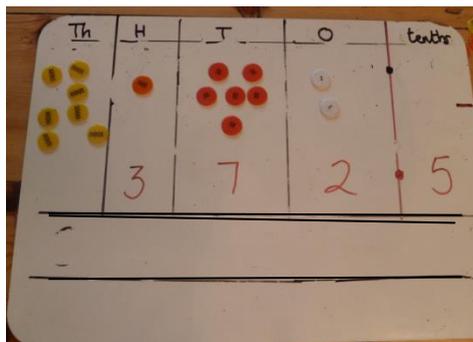
$$\begin{array}{r} 2754 \\ - 1562 \\ \hline 1192 \end{array}$$

7169 - 372.5 =

Subtract with decimal values, including mixtures of integers and decimals, aligning the decimal point.

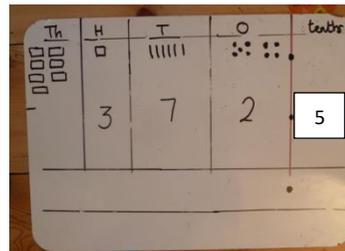
Use place value counters to demonstrate the calculation. Always draw the place value grid with columns so the children can clearly see the exchanges that need to be made.

$$7169 - 372.5 =$$

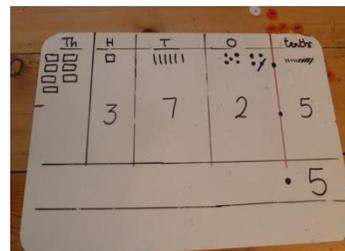


$$7169 - 372.5 =$$

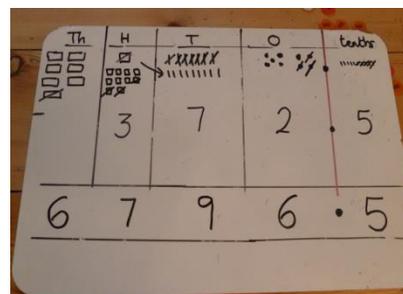
Step one:



Step two: Cross out the one and exchange for ten tenths.



Step three: Continue with the subtraction, exchanging and crossing out as you continue the calculation.



$$\begin{array}{r} \overset{6}{7} \overset{10}{1} \overset{8}{6} \overset{9}{9} \cdot \overset{0}{0} \\ - \quad \quad 372 \cdot 5 \\ \hline 6796 \cdot 5 \end{array}$$

Another example of how to set the abstract calculation out in books.

$$\begin{array}{r} \overset{10}{1} \overset{5}{5} \cdot \overset{3}{3} \overset{1}{1} \overset{9}{9} \text{ kg} \\ - \quad \quad 36 \cdot 08 \text{ kg} \\ \hline 69 \cdot 339 \text{ kg} \end{array}$$

