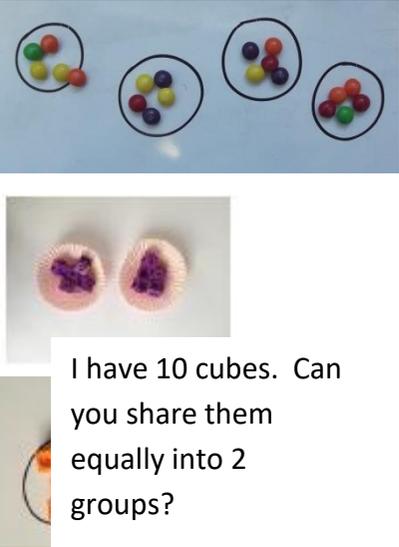
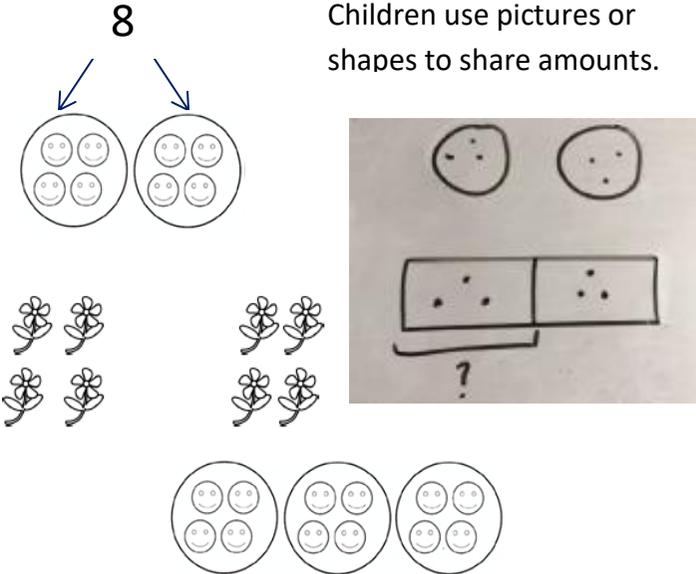
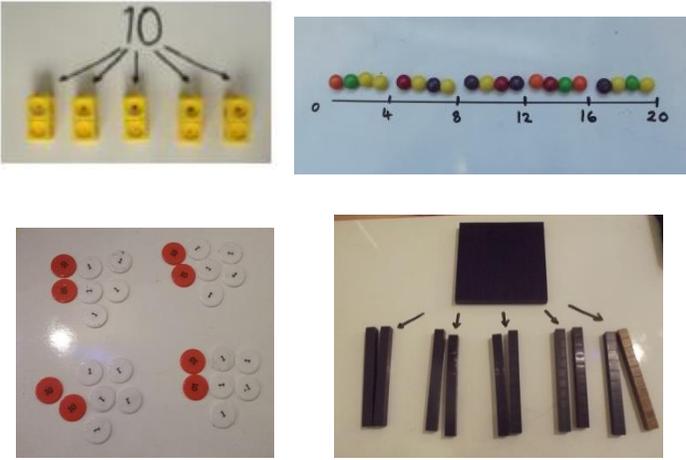
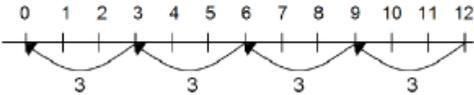
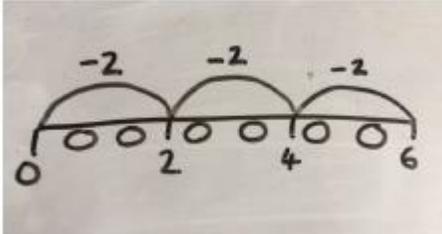
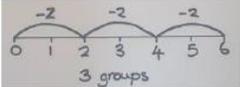
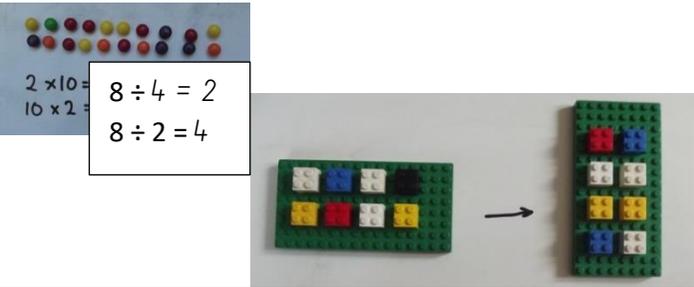
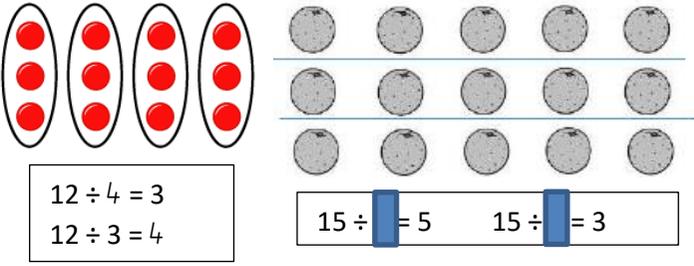
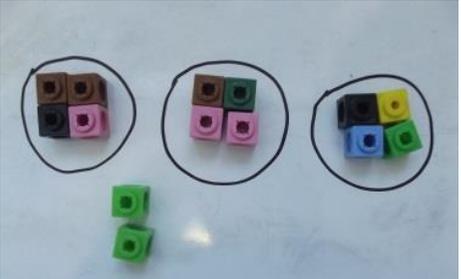


St Michael's Progression document using 'Concrete Pictorial & Abstract'

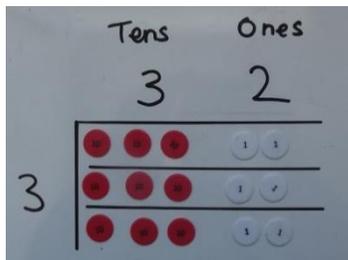
DIVISION (is also known as finding the average) **Quotient dividend divide**

STRATEGY	CONCRETE	PICTORIAL	ABSTRACT Use the equals sign both ways		
<p>Sharing objects into groups <u>Grouping</u></p>	 <p>I have 10 cubes. Can you share them equally into 2 groups?</p>	<p>8</p> <p>Children use pictures or shapes to share amounts.</p> 	<p>Share 9 sweets between 3 people.</p> $9 \div 3 = 3$ $6 \div 2 = 3$ <table border="1" data-bbox="1865 560 2101 600"> <tr> <td>3</td> <td>3</td> </tr> </table> <p>Half of 20 is... 10 is half of ...</p> $20 \div \square = 2$ $20 \div \square = 10$	3	3
3	3				
<p>Division as grouping</p>		<p>Use a number line to show jumps in groups. The number of jumps equals the number of groups.</p>  <p>Think of the bar as a whole. Split it into the number of groups you are dividing by and work out how many would be within each group.</p>  $20 \div 5 = ?$ $5 \times ? = 20$	$20 \div 5 = 4$ $20 \div \square = 4$ $20 \div \square = 5$ <p>Divide 20 by 5. How many in each group?</p>		

<p>Division as repeated subtraction</p>		<p>Children represent repeated subtraction pictorially.</p> 	<p>Abstract number groups to represent the groups which have been subtracted.</p> 
<p>Division as arrays</p>	<p>Link division to multiplication by creating an array and thinking about the number sentences which could be created eg</p> 	<p>Draw an array and use lines to split the array into groups to make multiplication and division sentences.</p> 	<p>Find the inverse of multiplication and division sentences by creating four linked number sentences.</p> <p> $3 \times 5 = 15$ $5 \times 3 = 15$ $15 \div 3 = 5$ $15 \div 5 = 3$ </p>
<p>Division with remainder</p>	<p>Divide groups between groups and see how much is left over eg. $16 \div 3 = 4 \text{ r } 2$</p> 	<p>Jump forward in equal amounts on a number line and then see how much more you need to jump to find a remainder.</p>  <p>Draw dots and group them to divide an amount and clearly leave a remainder.</p> 	<p>Complete written divisions and clearly show the remainder by writing 'r'.</p> <p>$12 \div 4 = 3 \text{ r } 2$</p>

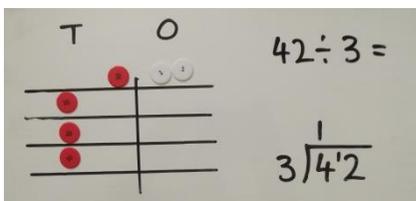
Short division

Use Place Value counters to divide numbers with no exchanging or remainders.
 eg. $96 \div 3 = 32$
 Format parallels bus stop layout.

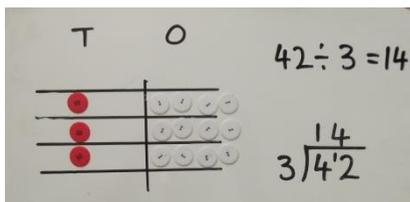


Dividing numbers which involve exchanging.
 eg $42 \div 3$. Use place value counters and model calculation alongside.
 Start with biggest PV counters.

We are sharing 40 into 3 groups. We can put 1 ten into each group and we have 1 ten left over.

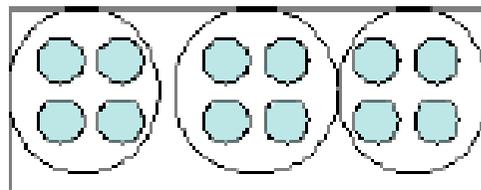


We exchange this ten for ten ones.

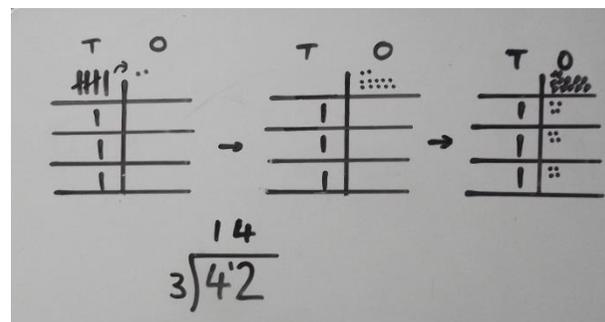


Also model with numbers which give remainders.

Children can continue to draw diagrams to help them divide numbers into equal groups.



Children should start to count in multiples to divide more efficiently.



Begin by using divisions which divide equally with no remainder:

$$\begin{array}{r} 32 \\ 3 \overline{)96} \end{array}$$

Then onto numbers which involve exchanging:

$$\begin{array}{r} 18 \\ 4 \overline{)72} \end{array}$$

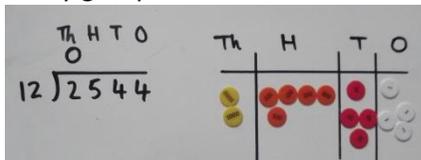
Then divisions with remainder:

$$\begin{array}{r} 86 \text{ r } 2 \\ 5 \overline{)432} \end{array}$$

Finally move onto remainders as decimals to divide the total accurately.

Long division with chunking (as per calculation policy).

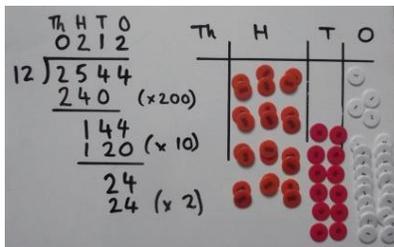
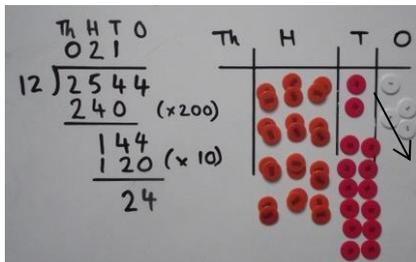
$2544 \div 12$
How many groups of 12 thousands do we have?



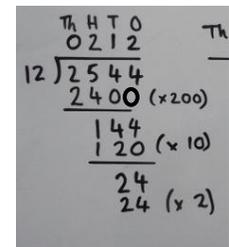
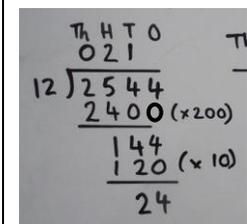
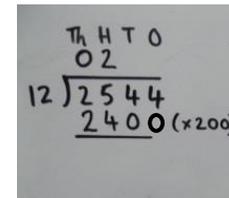
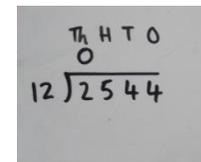
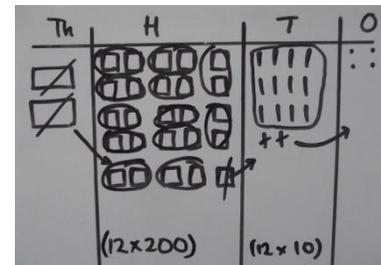
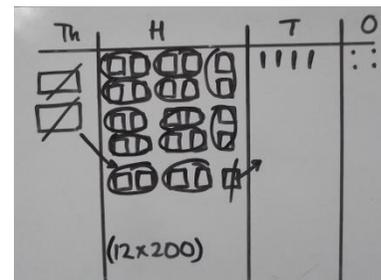
None, so we exchange 2 thousands for 20 hundreds. We can now subtract chunks of 12s and record this as repeated subtraction.



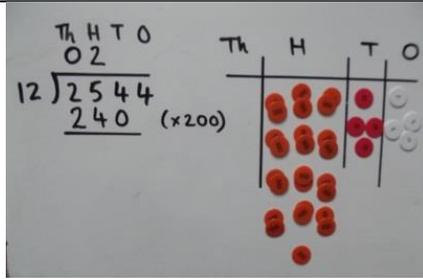
Exchange the Hundreds into Tens.



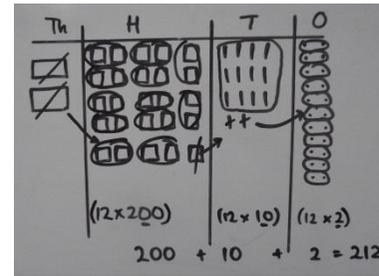
Children can draw base 10 to explain reasoning.



NB –
the
an
use
apparatus before moving onto the abstract representation.



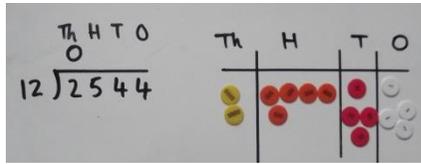
these concrete models show calculation as aid for the teacher. Children would use the concrete apparatus before moving onto the abstract representation.



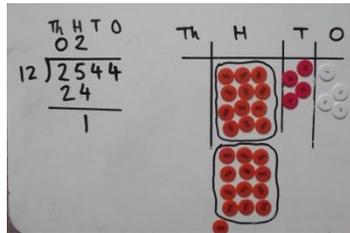
Long division

$$2544 \div 12$$

How many groups of 12 thousands have we got? None, so exchange 2 thousands for 20 hundreds.

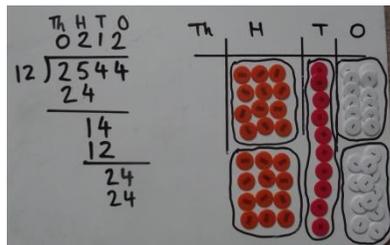
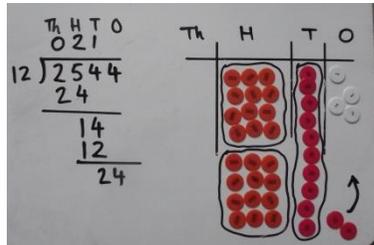


How many groups of 12 are there in 25 hundreds? Circle them. We have grouped 24 hundreds and are left with one.

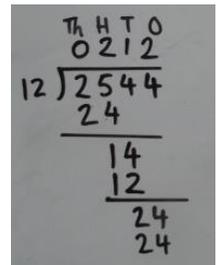
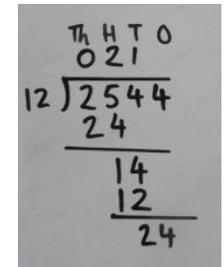
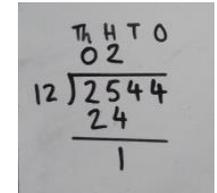
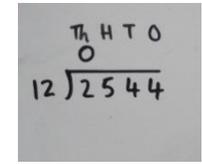
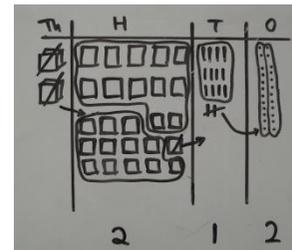
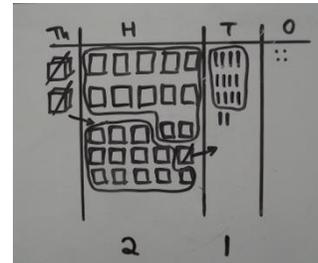
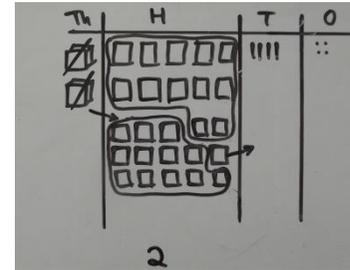
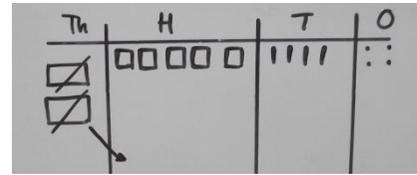


Exchange the H for T so now we have 14 tens. How many groups of 12 are there in 14?

1 remainder 2.



Children can draw base 10 to explain reasoning (it's quicker than drawing counters).



	<p>NB – these concrete models show the calculation as an aid for the teacher. Children would use the concrete apparatus before moving onto the abstract representation.</p>		
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