
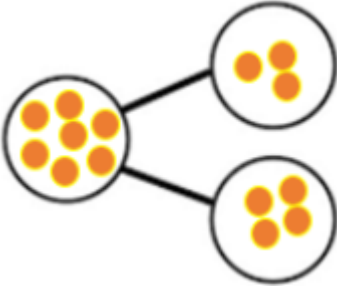
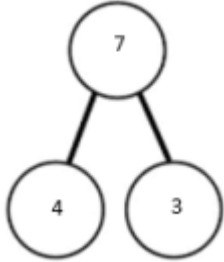
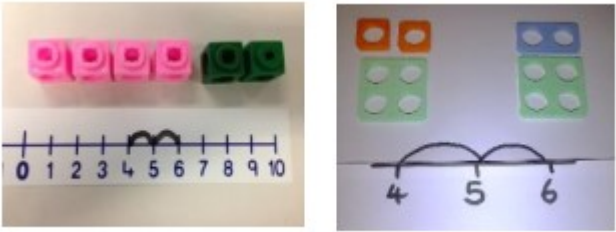
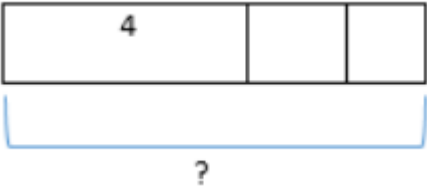
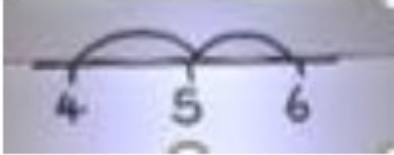
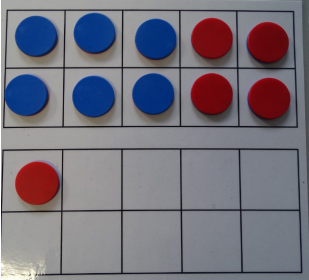
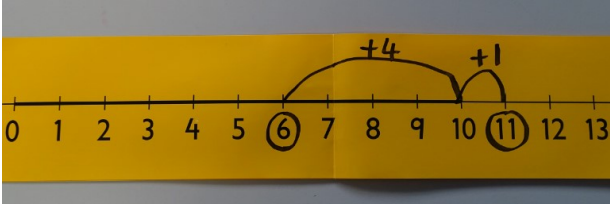
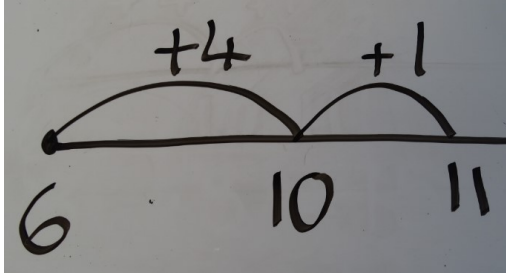


Addition

Key language which should be used: sum, total, parts and wholes, plus, add, altogether, more than, 'is equal to' 'is the same as, increase, makes, addition

Concrete	Pictorial	Abstract
<p>Combining two parts to make a whole (use other resources too e.g. eggs, shells, teddy bears etc)</p> 		<p>$4 + 3 = 7$ (four is a part, 3 is a part and the whole is seven)</p> 
<p>Counting on from the biggest number using number lines by using cubes or numicon</p> 	<p>A bar model which encourages the children to count on</p> 	<p>The abstract number line: What is 2 more than 4? What is the sum of 4 and 4? What's the total of 4 and 2? $4 + 2$</p> 
<p>Regrouping to make 10 by using ten frames and counters/cubes</p> 	<p>Children to use a number line to make 10</p> 	<p>The abstract number line:</p> 

Concrete

TO + O using Dienes. Continue to develop understanding of partitioning and place value
41 + 8



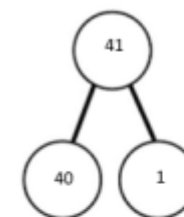
Pictorial

Children to represent the concrete using a particular symbol e.g. lines for tens and dot/crosses for ones.



Abstract

41 + 8



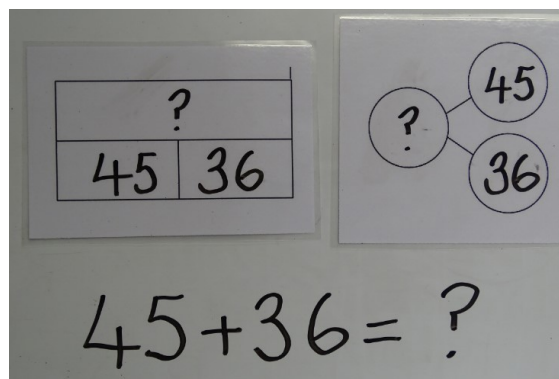
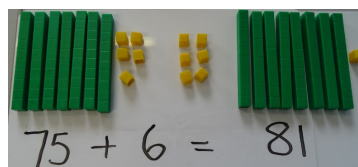
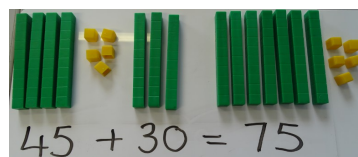
$$1 + 8 = 9$$

$$40 + 9 = 49$$

	4	1
+		8
<hr/>		
	4	9

TO + TO using Dienes. Use partitioning and bridging 10.

45 + 36



Children to start with the largest number and add the tens and then the ones.

$$45 + 36$$

$$45 + 30 = 75$$

$$75 + 6 = 81$$

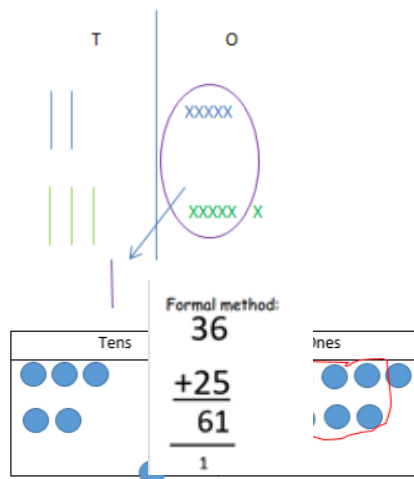
Concrete

TO + TO using Dienes. Continue to develop understanding of partitioning and place value and use this to support addition. Begin with no exchanging. $36 + 25$

	Tens	Ones
+		
+		
=		

Pictorial

This could be done one of two ways:

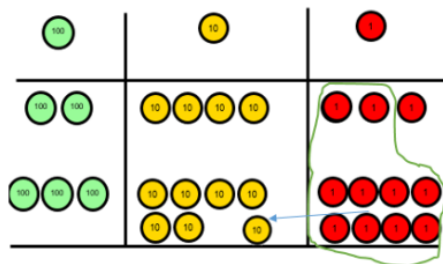


Abstract

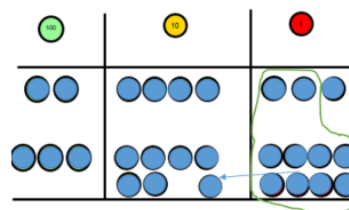
Expanded and formal written methods

$\begin{array}{r} T \quad O \\ 30 \quad 6 \\ + 20 \quad 5 \\ \hline 60 \quad + 1 \\ \hline 10 \end{array}$	<p>Formal method:</p> $\begin{array}{r} 36 \\ +25 \\ \hline 61 \\ \hline 1 \end{array}$
--	---

Use of place value counters to add HTO + TO, HTO + HTO etc. once the children have had practice with this, they should be able to apply it to larger numbers and the abstract



Children to represent the counters e.g. like the image below



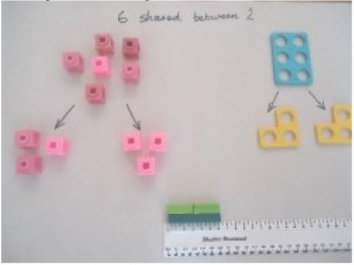

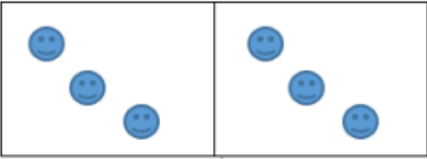
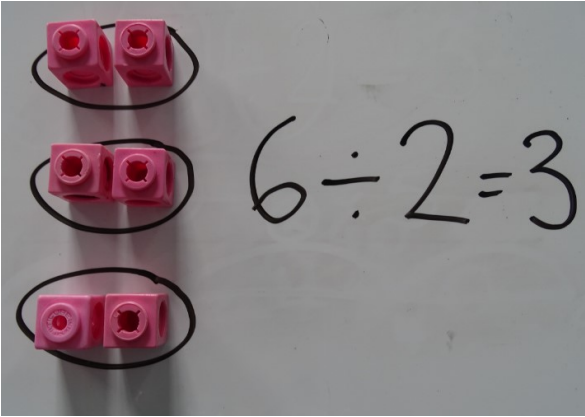
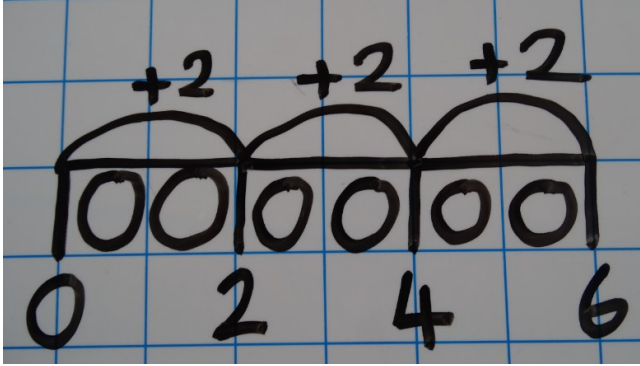
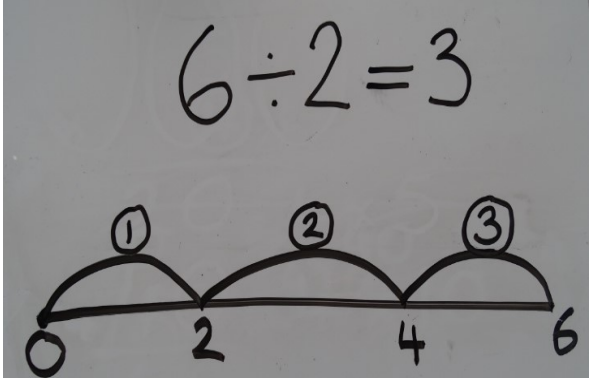
If the children are completing a word problem, draw a bar model to represent what it's asking them to do

?	
243	368

$\begin{array}{r} H \quad T \quad O \\ 200 \quad 40 \quad 3 \\ +300 \quad 60 \quad 8 \\ \hline 600 + 10 \quad + 1 \\ \hline 100 \quad 10 \end{array}$	$\begin{array}{r} 243 \\ +368 \\ \hline 611 \\ \hline 1 \quad 1 \end{array}$
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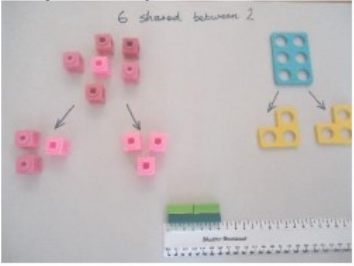


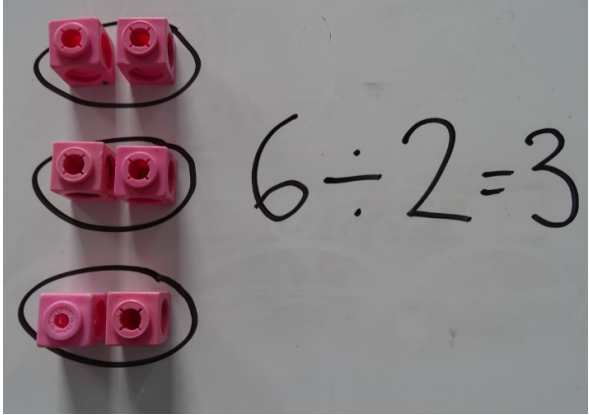
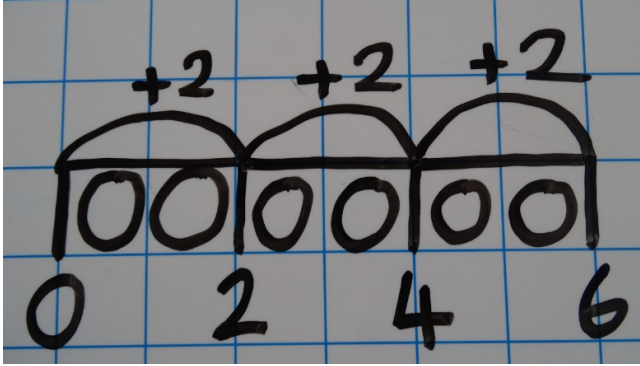
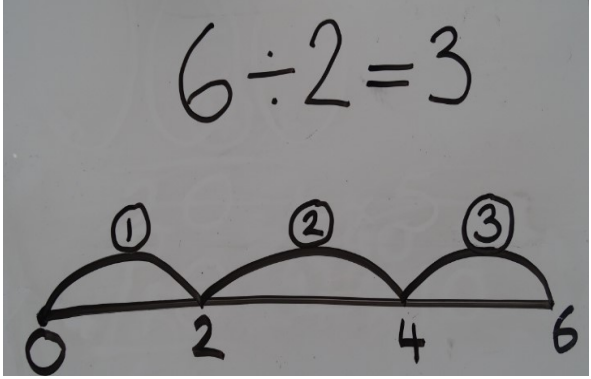
Division

Key language which should be used: share, group, divide, divided by, half, 'is equal to' 'is the same as', remainder, dividend, divisor, quotient.

Concrete	Pictorial	Abstract		
<p>6 shared between 2 (other concrete objects can also be used e.g. children and hoops, teddy bears, cakes and plates)</p>  <p>A photograph showing a whiteboard with the text "6 shared between 2". On the board, there are six pink blocks arranged in two groups of three. To the right, there are yellow blocks arranged in two groups of three. A ruler is visible at the bottom of the board.</p>	<p>Pictorial</p>  <p>Two circles, each containing three small circles. This represents 6 items divided into 2 groups of 3.</p> <p>This can also be done in a bar so all 4 operations have a similar structure:</p>  <p>A bar model divided into two equal sections. Each section contains three blue dots, representing 6 divided into 2 groups of 3.</p>	<p>Abstract</p> $6 \div 2 = 3$ <p>What's the calculation?</p> <table border="1" data-bbox="1491 544 2067 635"><tr><td>3</td><td>3</td></tr></table>	3	3
3	3			
<p>Understand division as repeated grouping</p> $6 \div 2$  <p>A photograph showing six pink blocks arranged in three groups of two. To the right, the equation $6 \div 2 = 3$ is written on a whiteboard.</p>	 <p>A number line on blue grid paper showing repeated addition. The line is marked from 0 to 6. Three arcs are drawn above the line, each labeled "+2". The arcs start at 0, 2, and 4, and end at 2, 4, and 6 respectively. The numbers 0, 2, 4, and 6 are written below the line.</p>	 <p>A number line on a grey background showing repeated subtraction. The line is marked from 0 to 6. Three arcs are drawn above the line, each labeled with a circled number 1, 2, and 3. The arcs start at 0, 2, and 4, and end at 2, 4, and 6 respectively. The numbers 0, 2, 4, and 6 are written below the line. Above the line, the equation $6 \div 2 = 3$ is written.</p>		

Division

Key language which should be used: share, group, divide, divided by, half, 'is equal to' 'is the same as', remainder, dividend, divisor, quotient.

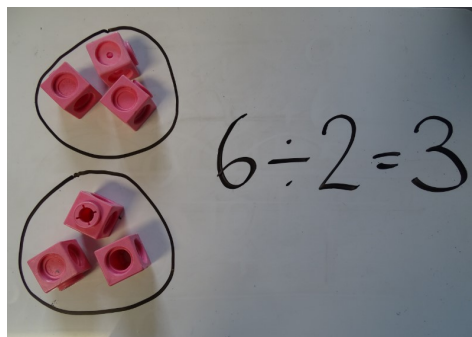
Concrete	Pictorial	Abstract		
<p>6 shared between 2 (other concrete objects can also be used e.g. children and hoops, teddy bears, cakes and plates)</p> 	<p></p> <p>This can also be done in a bar so all 4 operations have a similar structure:</p> 	<p>$6 \div 2 = 3$</p> <p>What's the calculation?</p> <table border="1" data-bbox="1491 544 2067 635"><tr><td>3</td><td>3</td></tr></table>	3	3
3	3			
<p>Understand division as repeated grouping</p> <p>$6 \div 2$</p> 				

Division

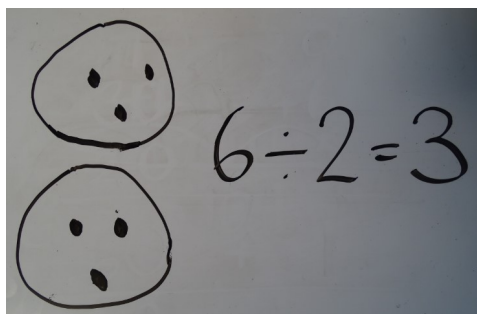
Concrete

Understand division as sharing

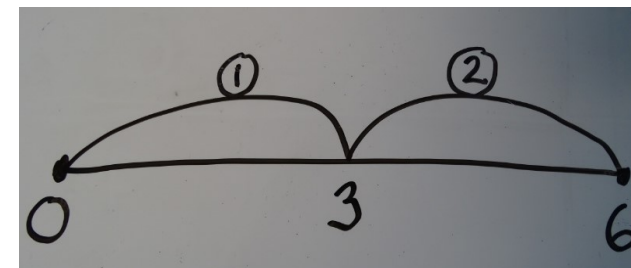
$$6 \div 2$$



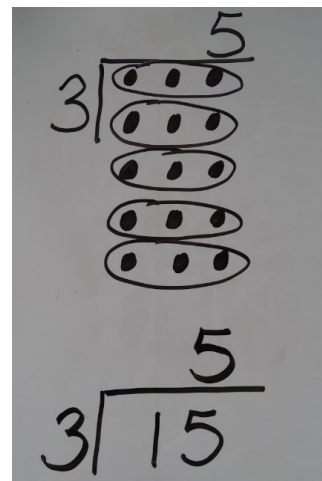
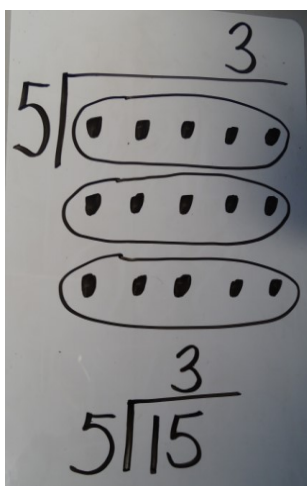
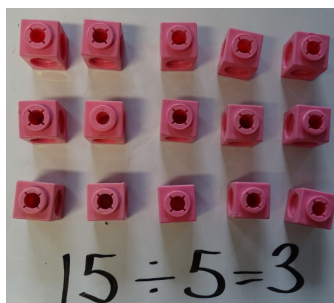
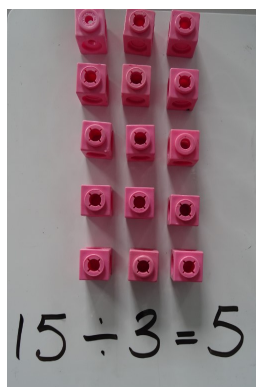
Pictorial



Abstract



Division with arrays.



Show the inverse with division and multiplication facts.

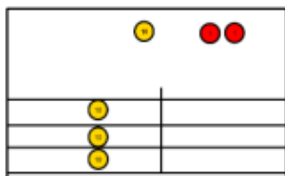
$$\begin{array}{l} 15 \div 3 = 5 \\ 15 \div 5 = 3 \\ 5 \times 3 = 15 \\ 3 \times 5 = 15 \end{array}$$

Division

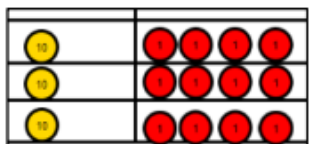
Concrete

Sharing using place value counters.

$$42 \div 3 = 14$$

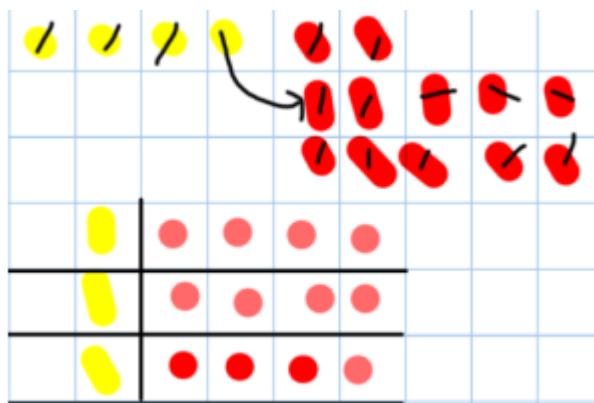


1. Make 42. Share the 4 tens between 3. Can we make an exchange with the extra 10?



Exchange the ten for 10 ones and share out 12 ones

Pictorial



Abstract

$$42 \div 3$$

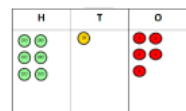
$$42 = 30 + 12$$

$$30 \div 3 = 10$$

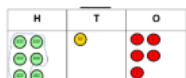
$$12 \div 3 = 4$$

$$10 + 4 = 14$$

Use of the 'bus stop method' using grouping and counters. Key language for grouping - how many groups of X can we make with X hundreds'- this can also be done using sharing!
 $615 \div 5$



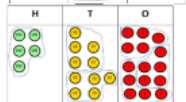
Step 1: make 615



Step 2: Circle your groups of 5

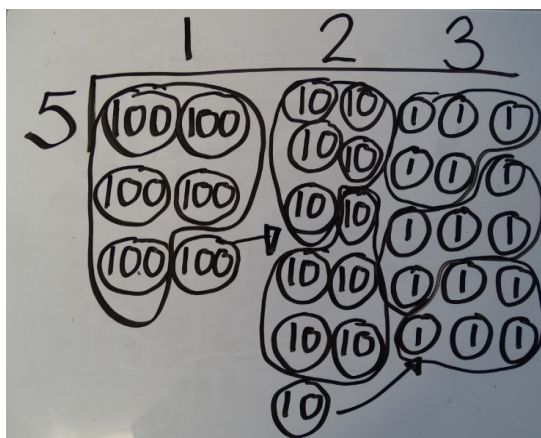


Step 3: Exchange 1H for 10T and circle groups of 5



Step 4: exchange 1T for 10ones and circles groups of 5

This can easily be represented pictorially, till the children no longer do it. It can also be done to decimal places if you have a remainder!



$$\begin{array}{r} 123 \\ 5 \overline{) 615} \end{array}$$

Division

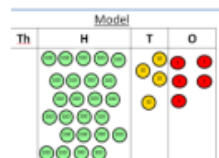
Concrete



$$2544 \div 12$$

$$\begin{array}{r} 0212 \\ 12 \overline{)2544} \\ \underline{24} \\ 14 \\ \underline{12} \\ 24 \\ \underline{24} \\ 0 \end{array}$$

How many groups of 12 thousands do we have? None



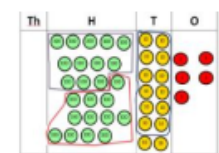
Exchange 2 thousand for 20 hundreds.



$$\begin{array}{r} 02 \\ 12 \overline{)2544} \\ \underline{24} \\ 1 \end{array}$$

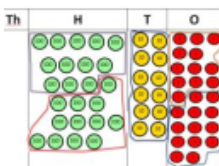
How many groups of 12 are in 25 hundreds? 2 groups. Circle them.

We have grouped 24 hundreds so can take them off and we are left with one.



$$\begin{array}{r} 021 \\ 12 \overline{)2544} \\ \underline{24} \\ 14 \\ \underline{12} \\ 2 \end{array}$$

Exchange the one hundred for ten tens so now we have 14 tens. How many groups of 12 are in 14? 1 remainder 2.



Exchange the two tens for twenty ones so now we have 24 ones. How many groups of 12 are in 24? 2

Pictorial

Children to represent the counters, pictorially and record the subtractions beneath.

Abstract

$$\begin{array}{r} 0 \\ 12 \overline{)2544} \end{array}$$

Step one- exchange 2 thousand for 20 hundreds so we now have 25 hundreds.

$$\begin{array}{r} 02 \\ 12 \overline{)2544} \\ \underline{24} \\ 1 \end{array}$$

Step two- How many groups of 12 can I make with 25 hundreds? The 24 shows the hundreds we have grouped. The one is how many hundreds we have left.

$$\begin{array}{r} 021 \\ 12 \overline{)2544} \\ \underline{24} \\ 14 \\ \underline{12} \\ 2 \end{array}$$

Exchange the one hundred for 10 tens. How many groups of 12 can I make with 14 tens? The 14 shows how many tens I have, the 12 is how many I grouped and the 2 is how many tens I have left.

$$\begin{array}{r} 0212 \\ 12 \overline{)2544} \\ \underline{24} \\ 14 \\ \underline{12} \\ 24 \\ \underline{24} \\ 0 \end{array}$$

Exchange the 2 tens for 20 ones. The 24 is how many ones I have grouped and the 0 is what I have left.