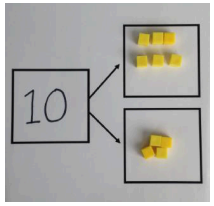
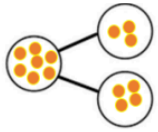
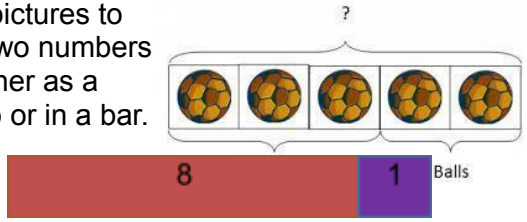
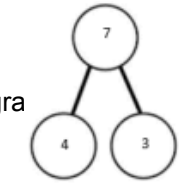
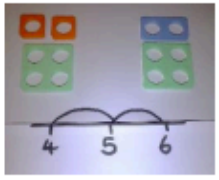
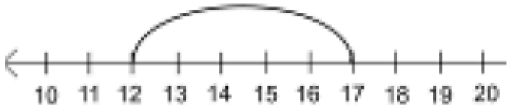
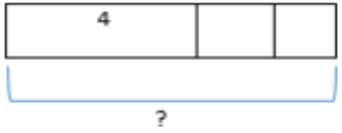
Anton Infant School

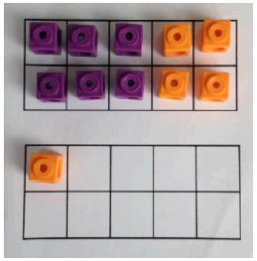
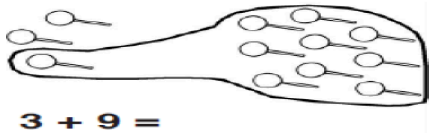
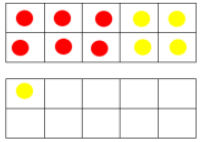
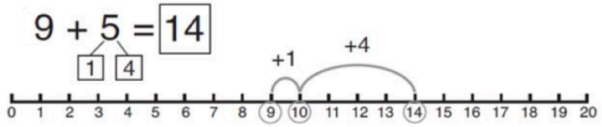
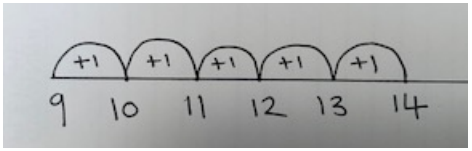
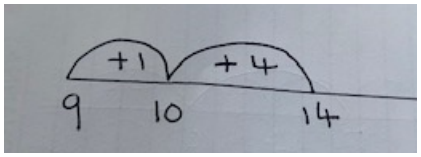
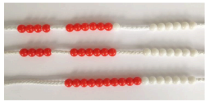
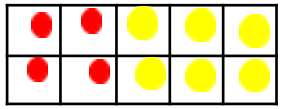
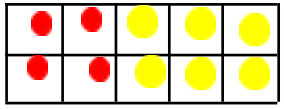
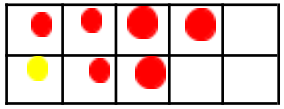
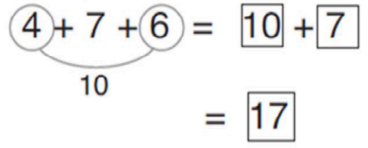
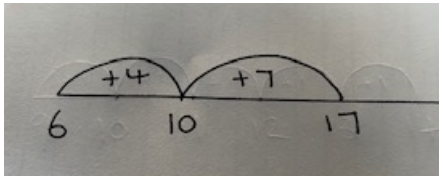
Maths CPA Guidance

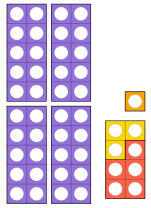
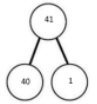
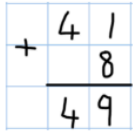
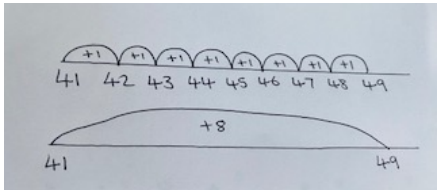
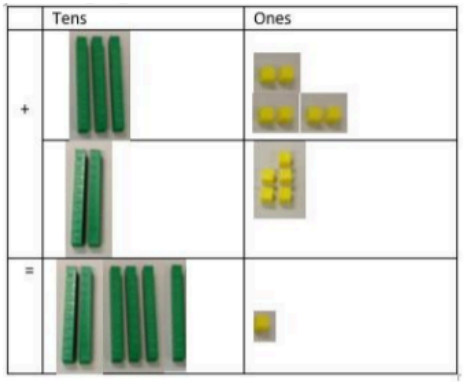
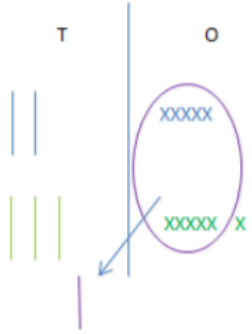
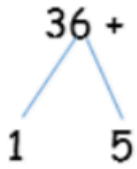
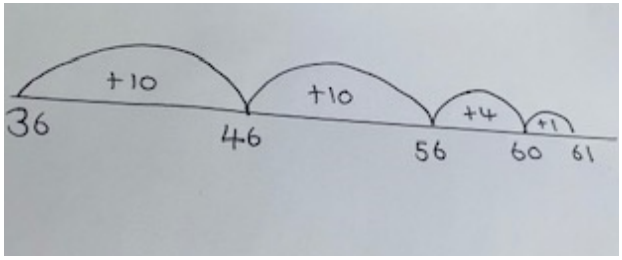
2024

Progression in Calculation

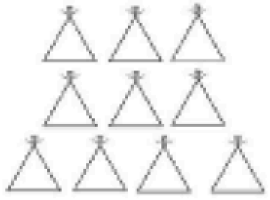
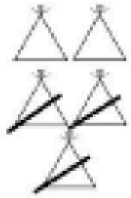
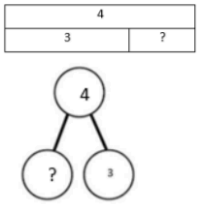
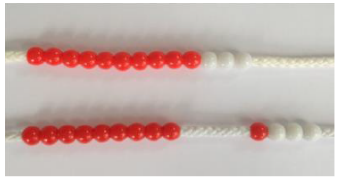
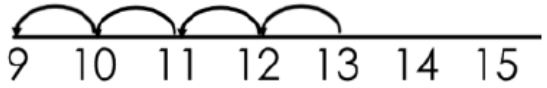
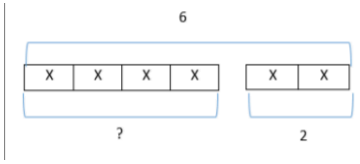
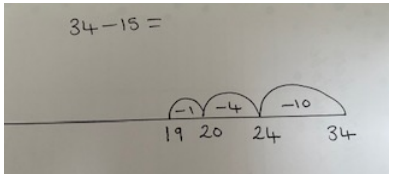
Addition

Objective and Strategies	Concrete	Pictorial	Abstract
Combining two parts to make a whole: part-whole model	    Use cubes to add two numbers together as a group or in a bar.	Use pictures to add two numbers together as a group or in a bar. 	4 + 3 = 7  Use the part-part whole diagra into the abstract.
Counting on leading to use of a numberline	 Start with the larger number on the bead string and then count on to the smaller number 1 by 1 to find the answer.   Concrete resources to support use of the numberline	12 + 5 = 17  Start at the larger number on the number line and count on in ones or in one jump to find the answer. A bar model which encourages children to count on 	Using an unstructured numberline to count on 4+2=6 

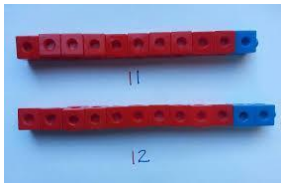
Regrouping to make 10.	6 + 5 = 11 Use of tens frames.  Start with the bigger number and use the smaller number to make 10.  Nunicon 	Use pictures or a number line. Regroup or partition the smaller number to make 10. Children draw the ten frame. Support with counters/cubes  Use of a structured numberline  	9 + 5= 14 Use of an unstructured numberline   Children to develop an understanding of equality e.g 6+?=11 6+5=5+? 6+5=?=4
Adding three single digits	4 + 7 + 6= 17 Put 4 and 6 together to make 10. Add on 7.  Following on from making 10, make 10 with 2 of the digits (if possible) then add on the third digit. Use objects in tens frames- counters, teddies etc 	  Add together three groups of objects. Recombine the groups to make 10 using tens frames	 Combine the two numbers that make 10 and then add on the remainder. Unstructured numberline 

T+O Using base 10	Children continue to develop understanding of partitioning and place value 41+8=   Numicon	Children pictorially represent tens and ones using drawings 	41 + 8  1 + 8 = 9 40 + 9 = 49  
TO+TO using base 10		 12+17=  	36 + 25=  30 + 20 = 50 5 + 5 = 10 50 + 10 + 1 = 61 

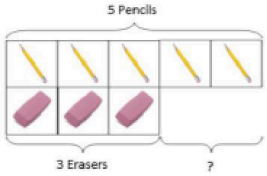
Subtraction

Objective and Strategies	Concrete	Pictorial	Abstract
Taking away ones	Use physical objects, counters, cubes etc to show how objects can be taken away.  6 – 2 = 4  	Cross out drawn objects to show what has been taken away.   15 – 3 = 12	4-3= ? = 4-3 
Counting back	Make the larger number in your subtraction. Move the beads along your bead string as you count backwards in ones. 13 – 4  Use counters and move them away from the group as you take them away counting backwards as you go.  	Count back on a number line  Start at the bigger number and count back the smaller number showing the jumps on the number line. Bar model 	Unstructured numberline 

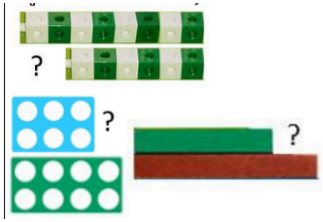
<table>
<tr>
<td>Find the difference</td>
<td>Compare amounts and objects to find the difference.

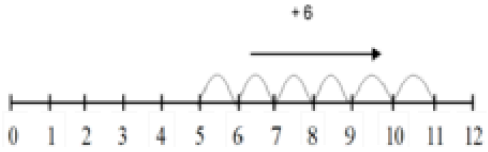
 

Use cubes to build towers or make bars to find the difference

Use basic bar models with items to find the difference

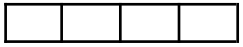
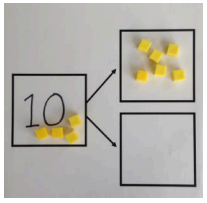
 
</td>
<td>Count on to find the difference.

xxxxxxxx
xxxxxx

Children draw cubes/ other concrete resources they have used

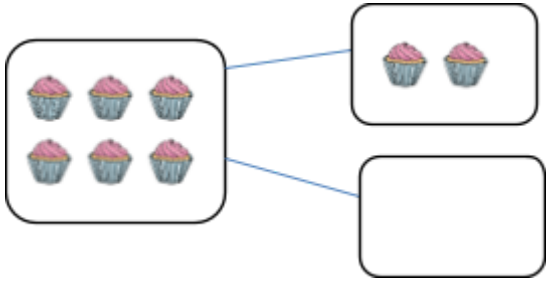
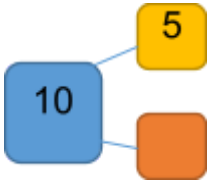
 
Draw bars to find the difference between 2 numbers.

  </td>
<td>Find the difference between 8 and 6.
8-6, the difference is?
Children also explore why 9-7=8-6 (The difference of each digit has changed by 1 so the difference is the same. This will help when solving 10000-9987</td>
</tr>
<tr>
<td>Part whole Model</td>
<td> 

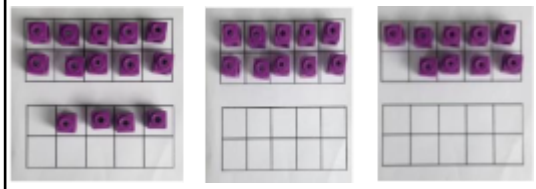
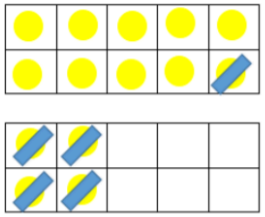
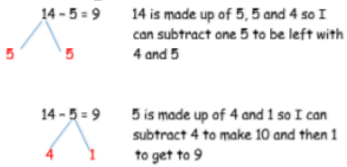
Link to addition- use the part whole model to help explain the inverse between addition and subtraction.

If 10 is the whole and 6 is one of the parts. What is the other part?

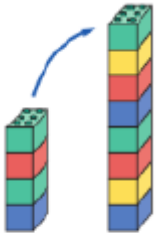
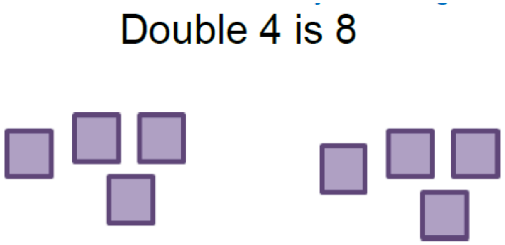
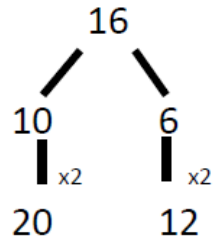
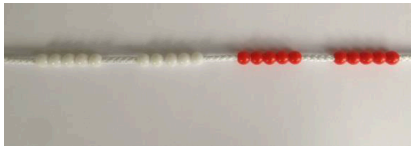
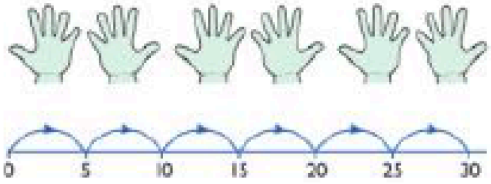
10 - 6 =</td>
<td>Use a pictorial representation of objects to show the part part whole model.

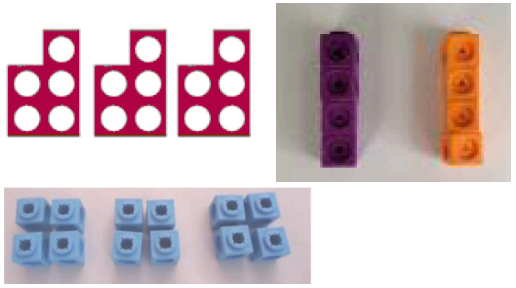
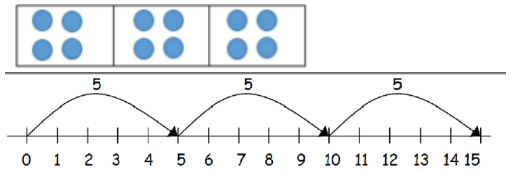
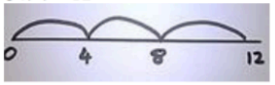
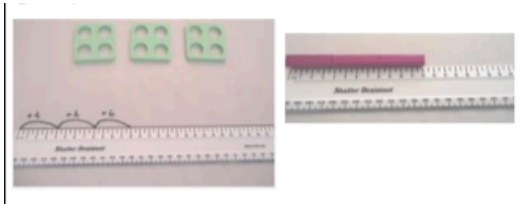
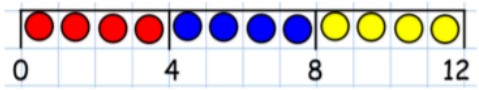
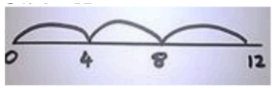
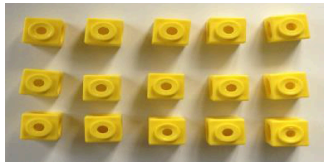
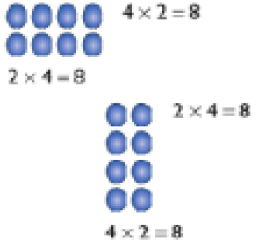
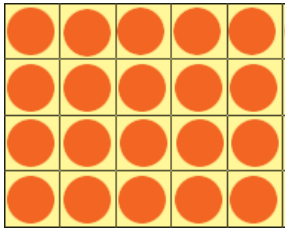
  </td>
<td> 

Move to using numbers within the part whole model.</td>
</tr>
</table>

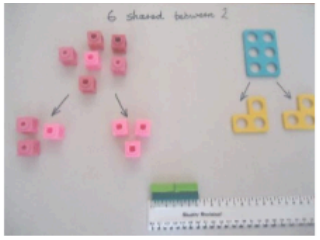
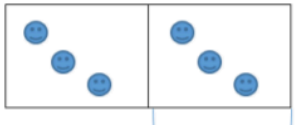
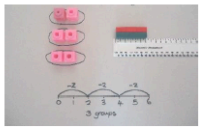
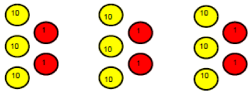
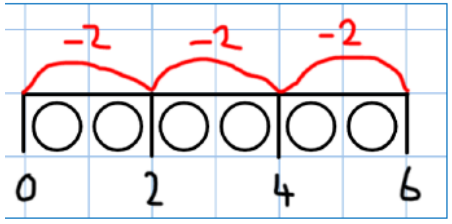
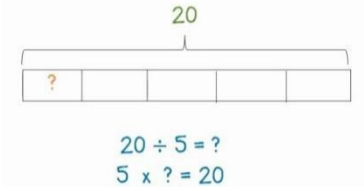
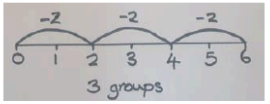
Make 10	14 – 5 =  Make 14 on the ten frame. Take away the four first to make 10 and then takeaway one more so you have taken away 5. You are left with the answer of 9. Using numicon 	 Children to present the ten frame pictorially Start at 14. Take away 4 to reach 10. Then take away the remaining 1 so you have taken away 5 altogether. You have reached your answer. Numberline	14-5= 9 You also want children to see related facts e.g 14-9=5 Children to represent how they have solved it e.g 

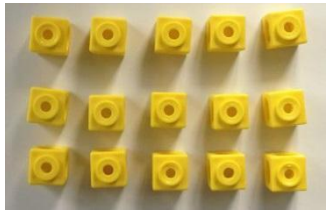
Multiplication

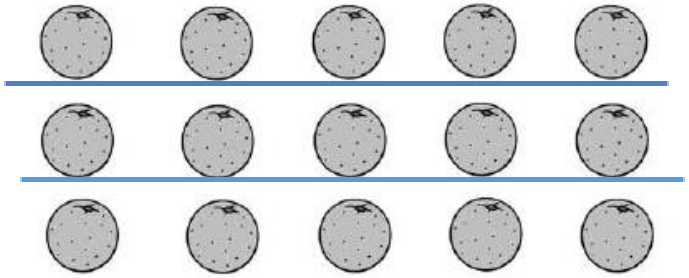
Objective and Strategies	Concrete	Pictorial	Abstract
Doubling	Use practical activities to show how to double a number.  double 4 is 8 4 × 2 = 8	Draw pictures to show how to double a number.  	 Partition a number and then double each part before recombining it back together.
Counting in multiples	  Count in multiples supported by concrete objects in equal groups.	 Use a number line or pictures to continue support in counting in multiples.	Count in multiples of a number aloud. Write sequences with multiples of numbers. 2, 4, 6, 8, 10 5, 10, 15, 20, 25 , 30

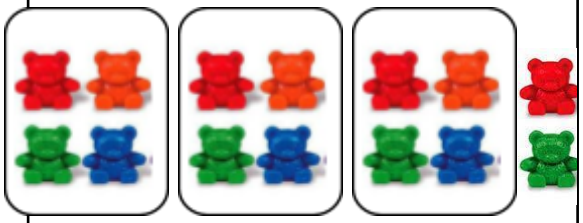
Repeated addition	Use different objects to add equal groups. 	Children represent practical resources in a picture XX XX XX XX XX XX Use of a bar model for a more structured method  5 + 5 + 5 = 15	3x4= 4+4+4= Solve on an unstructured numberline 
Using numberlines to show repeated groups	3x4 	Represent pictorially alongside a number line  	Unstructured numberline 
Arrays- showing commutativity	Create arrays using counters/ cubes to show multiplication sentences.  	Draw arrays in different rotations to find **commutative** multiplication sentences.   Link arrays to area of rectangles.	Use an array to write multiplication sentences and reinforce repeated addition.  5 + 5 + 5 = 15 3 + 3 + 3 + 3 + 3 = 15 3 x 5 = 15 5 x 3 = 15

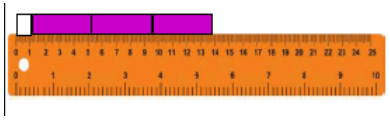
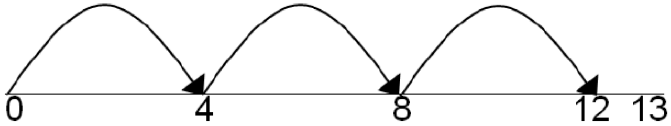
Division

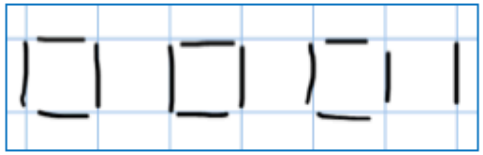
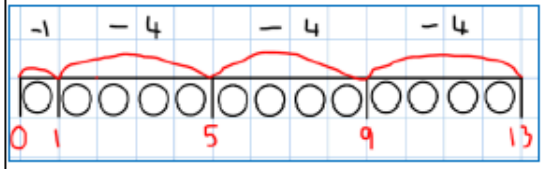
Objective and Strategies	Concrete	Pictorial	Abstract
Sharing objects into groups	6 Shared between 2 (Other concrete resources can be used e.g children and hoops, teddy bears, cakes and plates etc) 	 This can also be done in a bar 	6 ÷ 2= 3 What's the calculation? 
Division as repeated grouping	Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding.    96 ÷ 3 = 32 	Use a number line to show jumps in groups. The number of jumps equals the number of groups.  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. 	Unstructured numberline 

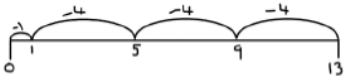
<table>
<tr>
<td>Division within arrays</td>
<td> 
Link division to multiplication by creating an array and thinking about the number sentences that can be created.

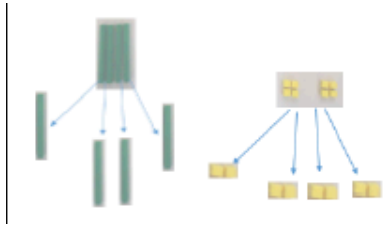
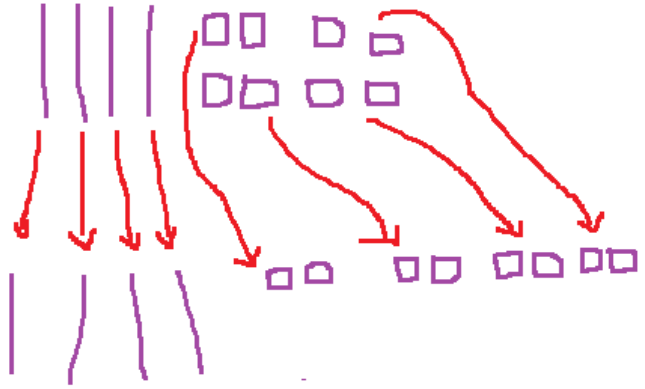
Eg 15 ÷ 3 = 5 5 x 3 = 15
15 ÷ 5 = 3 3 x 5 = 15</td>
<td> 
Draw an array and use lines to split the array into groups to make multiplication and division sentences.</td>
<td>Find the inverse of multiplication and division sentences by creating four linking number sentences.

7 x 4 = 28
4 x 7 = 28
28 ÷ 7 = 4
28 ÷ 4 = 7</td>
</tr>
<tr>
<td>Division with a remainder</td>
<td>14 ÷ 3 =
Divide objects between groups and see how much is left over
 
Use of lollipop sticks to form wholes

14÷3 
Use of cuisenaire rods and rulers (repeated subtraction)
  </td>
<td>Jump forward in equal jumps on a number line then see how many more you need to jump to find a remainder.
 
 

Draw dots and group them to divide an amount and clearly show a remainder.
 
 
Represent concrete method pictorially</td>
<td>Complete written divisions and show the remainder using r.
 

Unstructured numberline
  </td>
</tr>
</table>

2 digit divided by 1 digit using base 10 (no remainders)	48÷4 Start with the tens 	Children to represent the base 10 and sharing pictorially 	48 ÷ 4 4 tens ÷ 4 = 1 ten 8 ones ÷ 4 = 2 ones 10 + 2 = 12