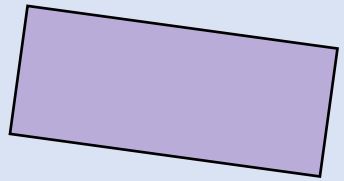
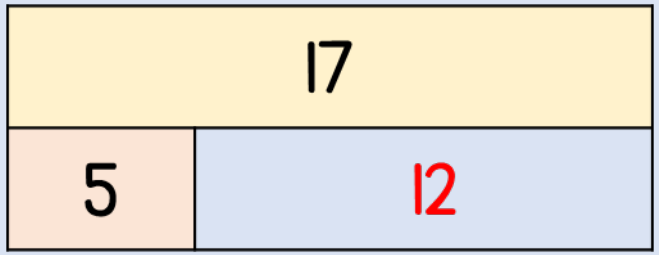
Maths Curriculum Meeting for Parents



1) Use $<$, $>$ or $=$ to compare the number sentences.

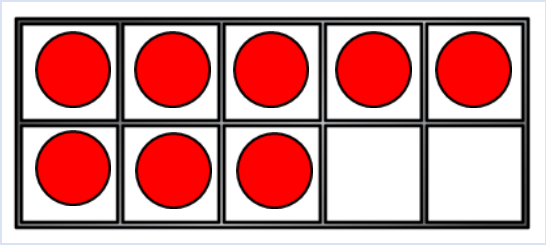
$5 + 6 \quad = \quad 6 + 5$

2) Complete the bar model.



3) Add together 7 and 6 13

4) What number is shown?



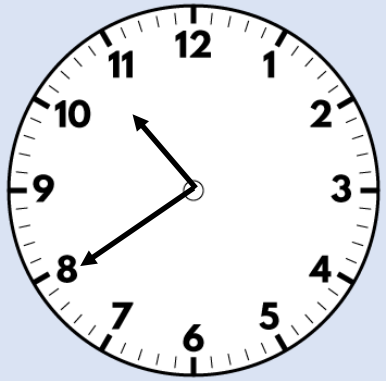
8

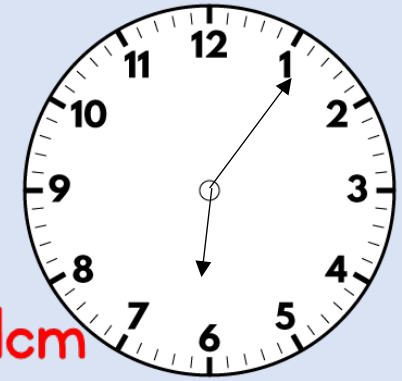
1) Work out 14×4 56

2) If $3 \times 8 = 24$, what is 80×3? 240

3) What is $96 \div 8$? 12

4) Find the difference between 182 and 175 7





1) If a rectangle has area 16 cm^2, what could the side lengths of the rectangle be?

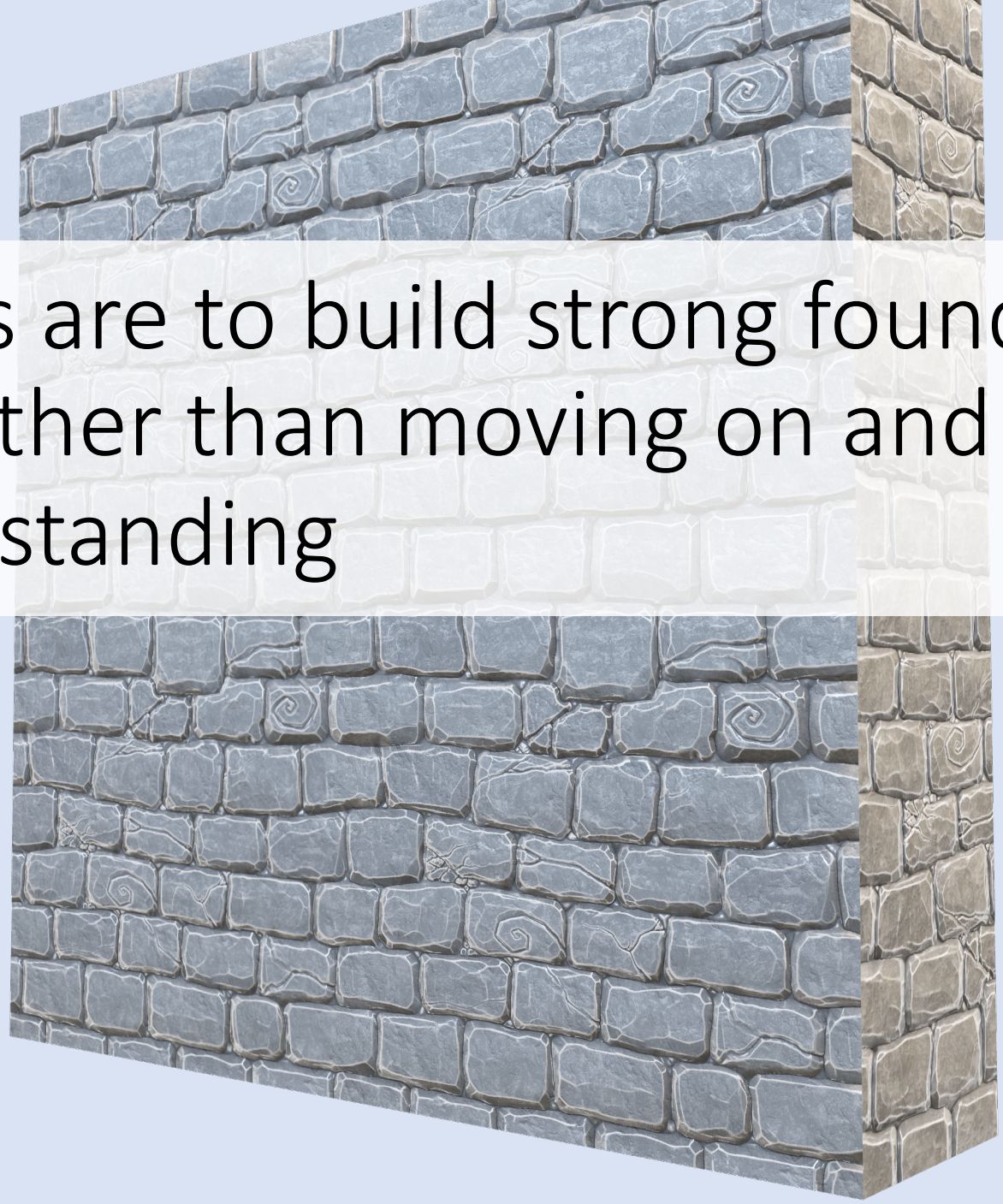
e.g. 8 cm and 2 cm, 16 cm and 1 cm, 4cm and 4cm

2) How many cm are there in 3.7 m? 370

3) Solve the equation $47 = y - 5$ $y = 52$

4) Work out $\frac{7}{8}$ of 64 56

The curriculum implemented in 2014 is based on mastery



The principles are to build strong foundations to build on rather than moving on and leaving gaps in understanding

Mastery

Mastery is based on the idea of children

- Not moving on until they are secure in their understanding of a particular concept.
- The whole class is taught the same thing, at the same time, with children learning at an appropriate level through support and enrichment.

Exercise 1

Take the following calculations and complete:

2345 + 2764 12876 + 23456 30987564 + 234572

1234568321
+2874650534

3000000000
- 1000000001

Does this prove that the children are good at maths?

What are the key components of mastery?

- Fluency
- Reasoning
- Problem Solving

Exercise 2: Questions that a teacher may ask

Calculate 123 + 86

How do you know that you have the correct answer?

What strategy could you use to make the calculation easier?

Now show me at least 2 other ways to calculate this:

Is 123 + 86 the same as 126 + 83?

How do you know? Prove it

The mastery concept underpins our calculation policy as we want children to fully understand number rather than carry out procedure.

Calculation Policy

The video below demonstrates what mastery might look like.

A sense of number: https://vimeo.com/152139735

The development of calculation is based on three main principles:

Concrete, Pictoral, Abstract

In that order, but they are inter-related so that the children build small building blocks within larger building blocks, which all lead to a secure understanding.

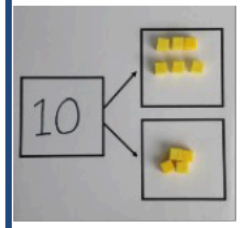
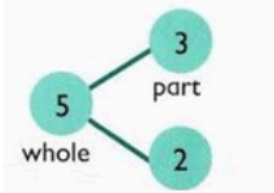
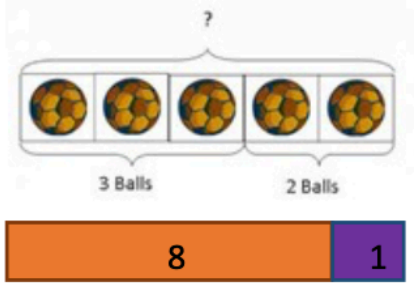
The calculation policy slides show progression in addition, subtraction, multiplication and division. These are some of the steps, <u>not all.</u>

Please note:

The long division examples on the policy show long division using division by 2. This is to show the method.

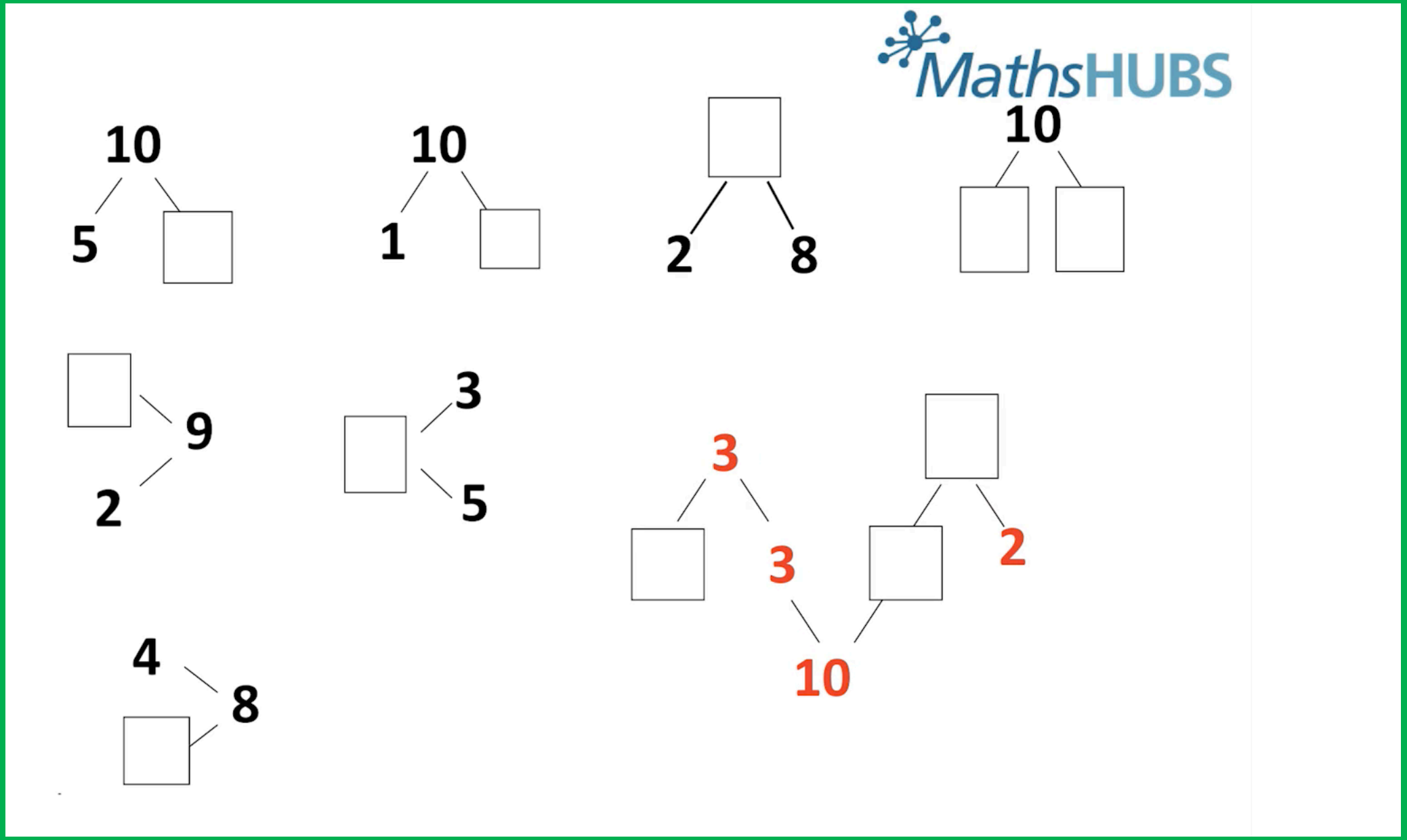
We would not expect our children to use long division when dividing by 2.

Addition

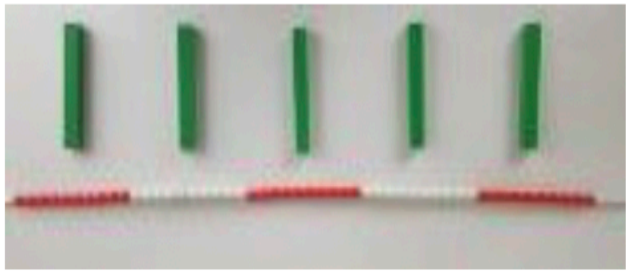
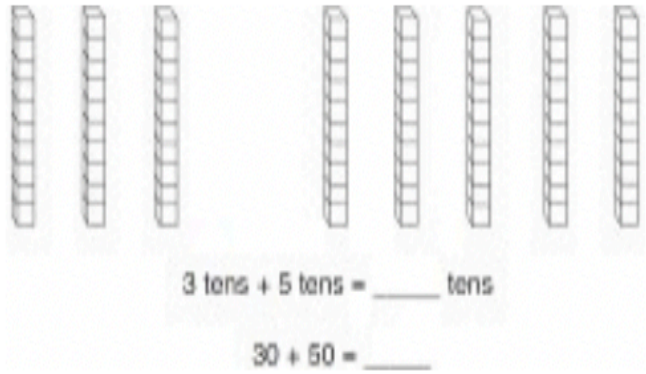
Objective & Strategy	Concrete	Pictorial	Abstract
Combining two parts to make a whole: part- whole model	   Use part part whole model. Use cubes to add two numbers together as a group or in a bar. 	   Use pictures to add two numbers together as a group or in a bar.	4 + 3 = 7  10= 6 + 4 Use the part-part whole diagram as shown above to move into the abstract.

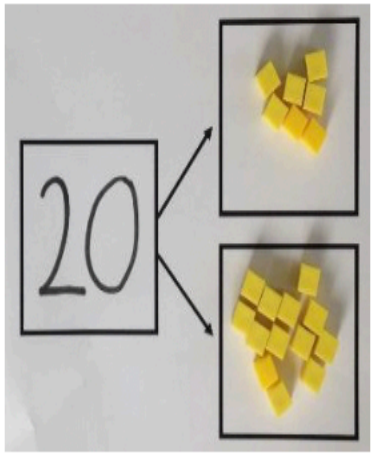
Is 9 + 1 the same as 1 + 9?

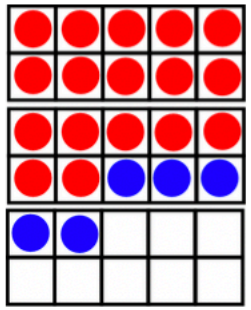
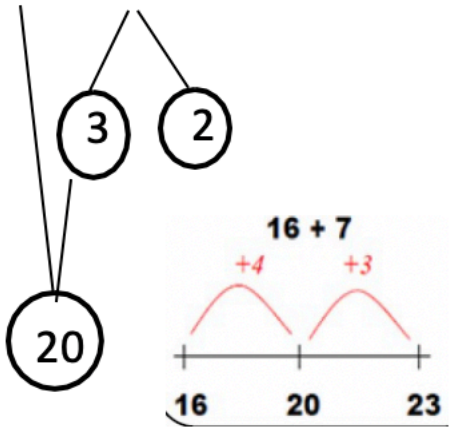
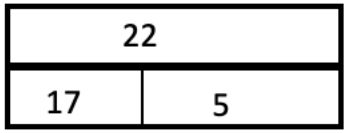
This is what we call variation



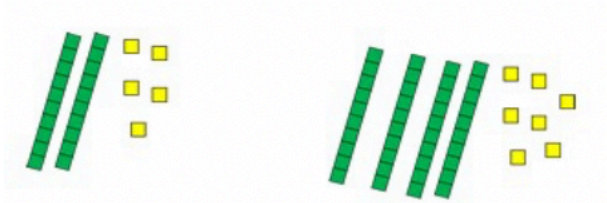
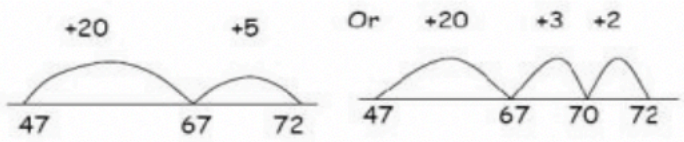
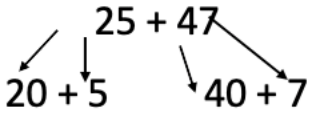
Reinforcement through different representations:

Adding multiples of ten	50= 30 = 20  Model using dienes and bead strings	 Use representations for base ten.	20 + 30 = 50 70 = 50 + 20 40 + □ = 60

Use known number facts Part part whole	 Children explore ways of making numbers within 20	 $\square + \square = 20$ $20 - \square = \square$ $\square + \square = 20$ $20 - \square = \square$	$\square + 1 = 16$ $16 - 1 = \square$ $1 + \square = 16$ $16 - \square = 1$

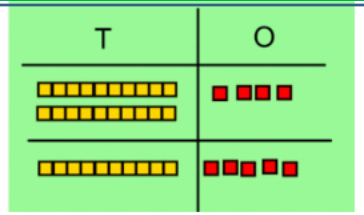
Add a two digit number and ones	 17 + 5 = 22 Use ten frame to make 'magic ten Children explore the pattern. 17 + 5 = 22 27 + 5 = 32	17 + 5 = 22 Use part part whole and number line to model.  	17 + 5 = 22 Explore related facts 17 + 5 = 22 5 + 17 = 22 22—17 = 5 22—5 = 17 

Practise

Add two 2-digit numbers	 Model using dienes , place value counters and numicon	 Use number line and bridge ten using part whole if necessary.	 20 + 40 = 60 5+ 7 =12 60 + 12 = 72

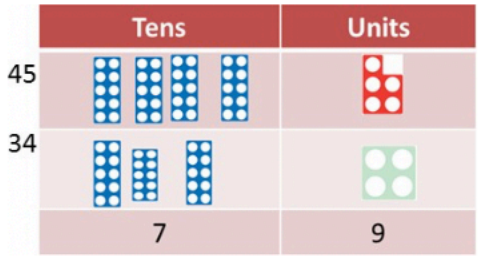
Column Addition—no regrouping (friendly numbers)

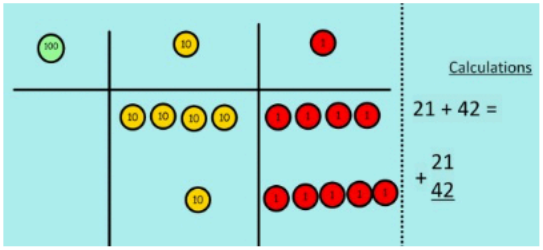
Add two or three 2 or 3-digit numbers.



Model using Dienes or nu-micon

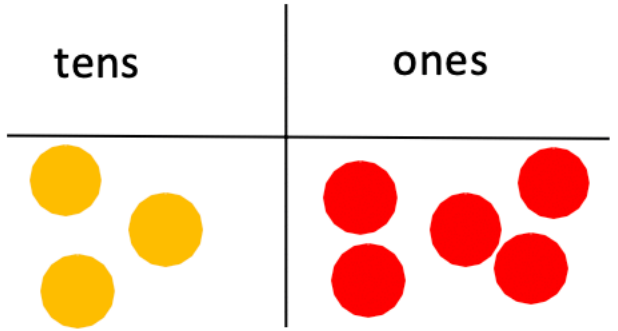
Add together the ones first, then the tens.





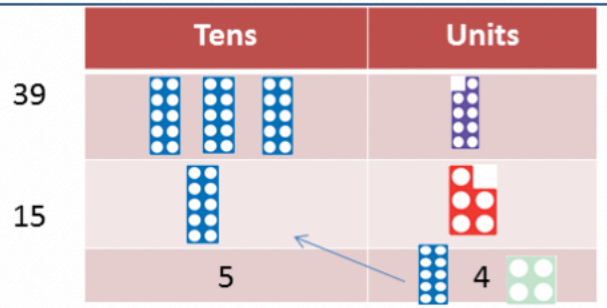
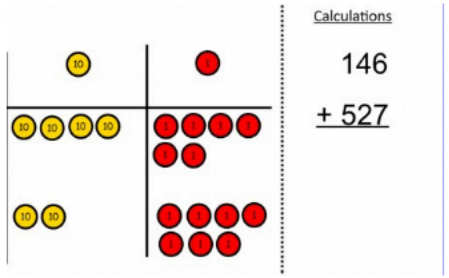
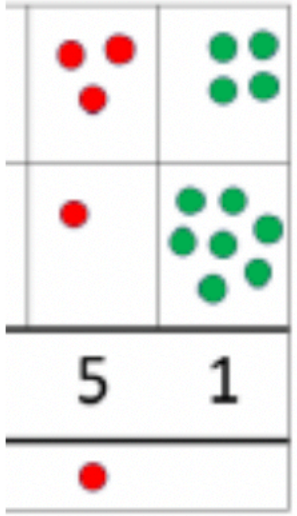
Move to using place value counters

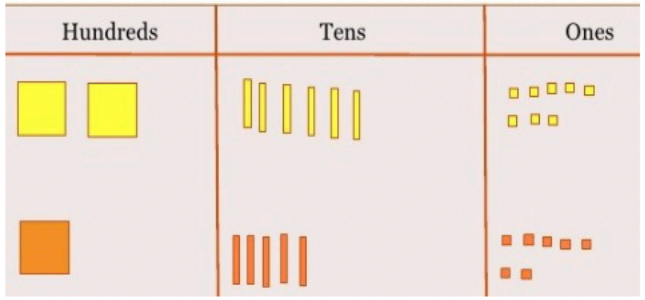
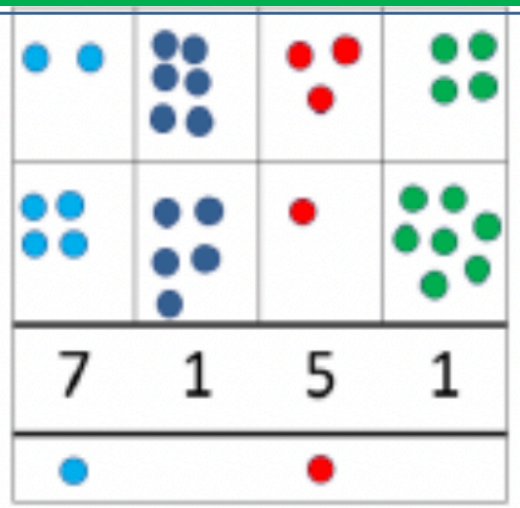
Children move to drawing the counters using a tens and one frame.

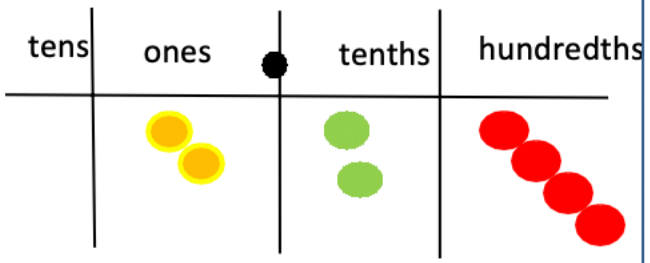
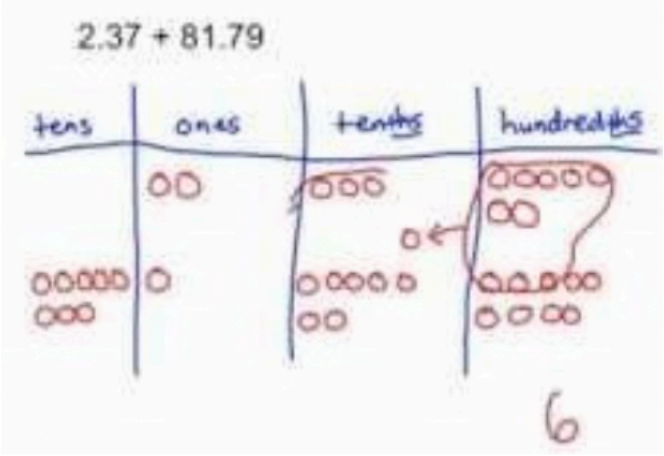


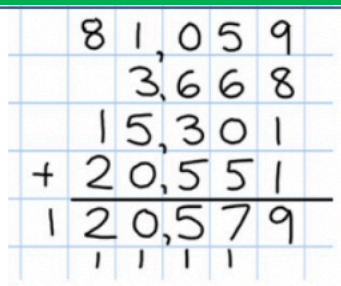
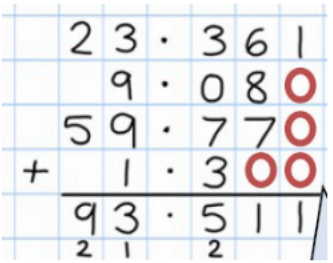
$$\begin{array}{r} 223 \\ +\ 114 \\ \hline 337 \end{array}$$

Add the ones first, then the tens, then the hundreds.

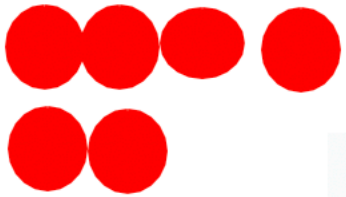
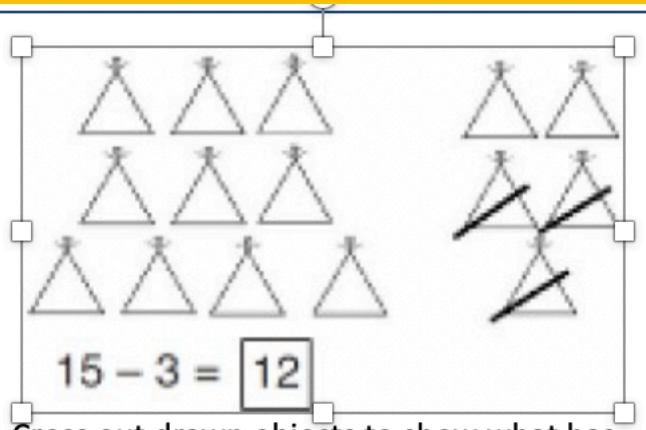
Column Addition with regrouping.	 Exchange ten ones for a ten. Model using numicon and pv counters. 	 Children can draw a representation of the grid to further support their understanding, carrying the ten **underneath** the line	$20 + 5$ $40 + 8$ $60 + 13 = 73$ Start by partitioning the numbers before formal column to show the exchange. $\begin{array}{r} 536 \\ +\ 85 \\ \hline 621 \\ \hline 1\ 1 \end{array}$

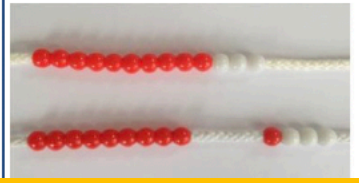
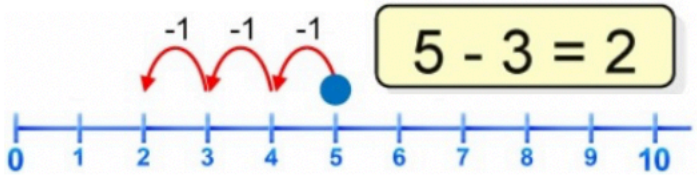
Y4—add numbers with up to 4 digits	~~Children continue to use dienes or pv~~ counters to add, exchanging ten ones for a ten and ten tens for a hundred and ten hundreds for a thousand. 	 Draw representations using pv grid.	Continue from previous work to carry hundreds as well as tens. Relate to money and measures.

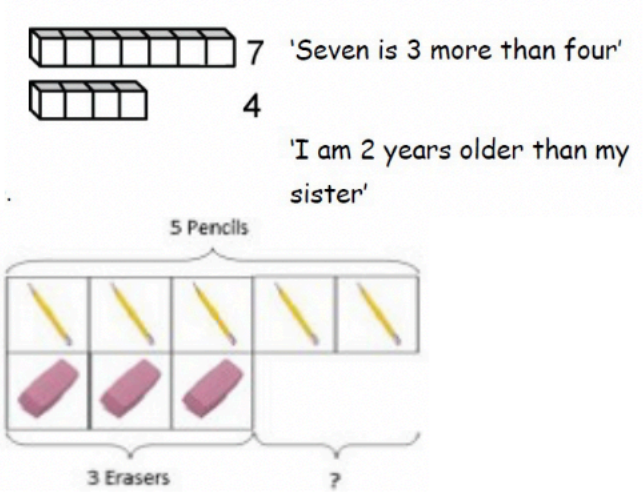
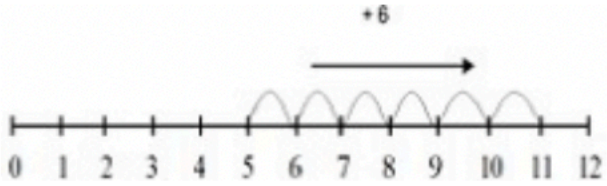
Y5—add numbers with more than 4 digits. Add decimals with 2 decimal places, including money.	As year 4  Introduce decimal place value counters and model exchange for addition.	 	72.8 + 54.6 127.4 1 1 £23.59 + £7.55 £31.14

Y6—add several numbers of increasing complexity Including adding money, measure and decimals with different numbers of decimal points.	As Y5	As Y5	 Insert zeros for place holders. 

Subtraction

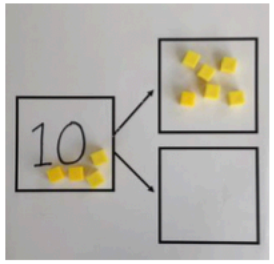
Taking away ones.	Use physical objects, counters , cubes etc to show how objects can be taken away.  6—4 = 2  4—2 = 2	 Cross out drawn objects to show what has been taken away.	7—4 = 3 16—9 = 7

Counting back	 Move objects away from the group, counting backwards.  Move the beads along the bead string as you count backwards.	 Count back in ones using a number line.	Put 13 in your head, count back 4. What number are you at?

Find the Difference	Compare objects and amounts  Lay objects to represent bar model.	Count on using a number line to find the difference.  	Hannah has12 sweets and her sister has 5. How many more does Hannah have than her sister.?

Represent and use number bonds and related subtraction facts within 20

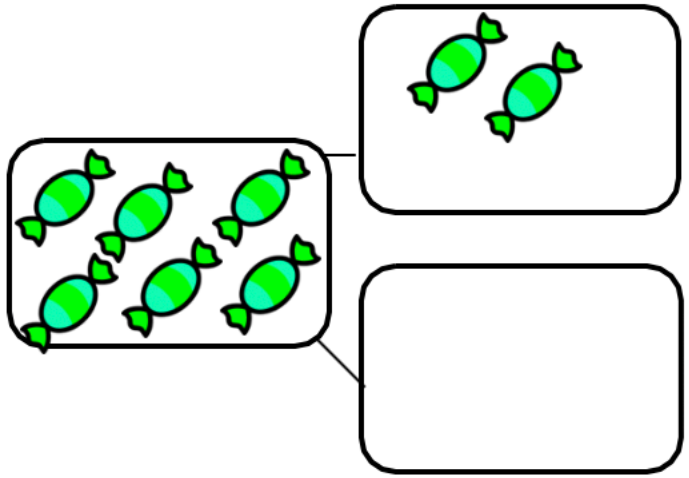
Part Part Whole model



Link to addition. Use PPW model to model the inverse.

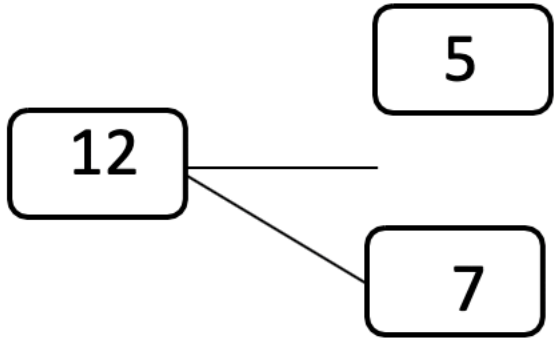
If 10 is the whole and 6 is one of the arts, what s the other part?

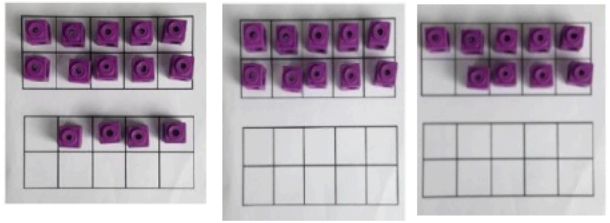
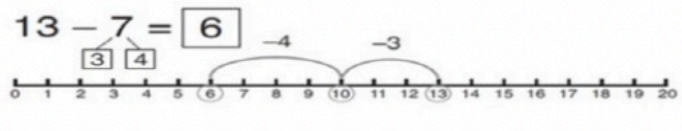
10—6 = 4

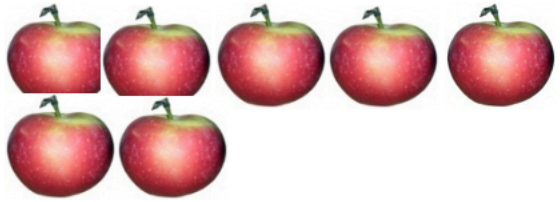


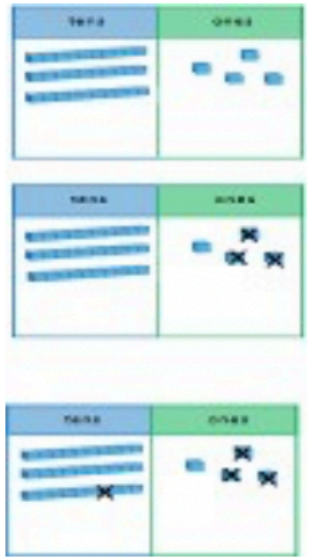
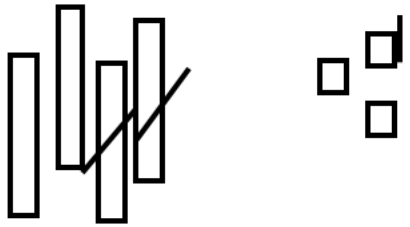
Use pictorial representations to show the part.

Move to using numbers within the part whole model.

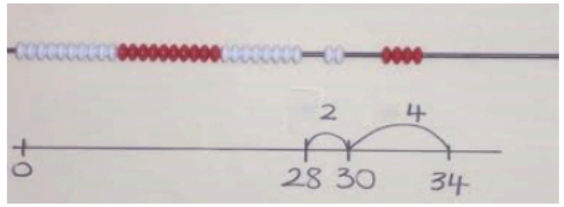
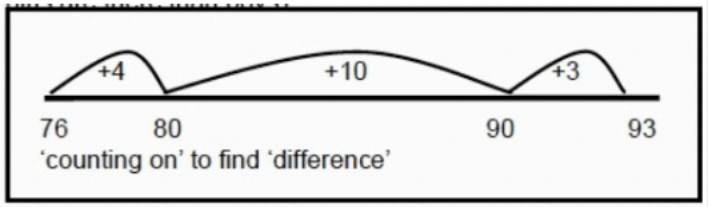


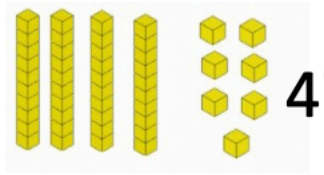
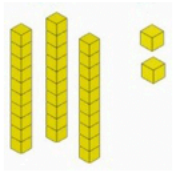
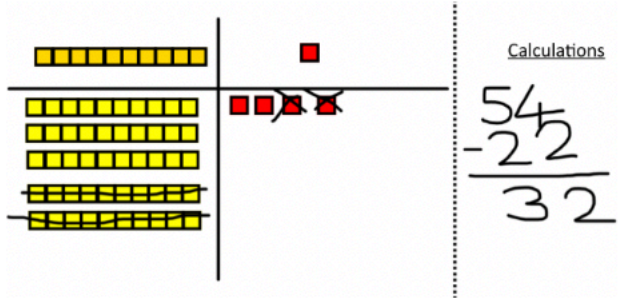
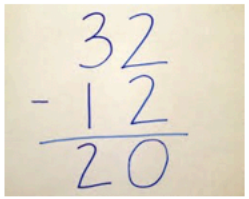
Make 10	14—9	13—7	16—8
	 Make 14 on the ten frame. Take 4 away to make ten, then take one more away so that you have taken 5.	 Jump back 3 first, then another 4. Use ten as the stopping point.	How many do we take off first to get to 10? How many left to take off?

Bar model	 5—2 = 3		 10 = 8 + 2 10 = 2 + 8 10—2 = 8 10—8 = 2

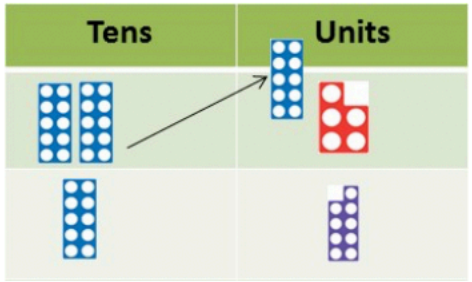
Partitioning to subtract without regrouping. *'Friendly numbers'*	34—13 = 21 Use Dienes to show how to partition the number when subtracting without regrouping.		Children draw representations of Dienes and cross off.  43—21 = 22	43—21 = 22

Practise

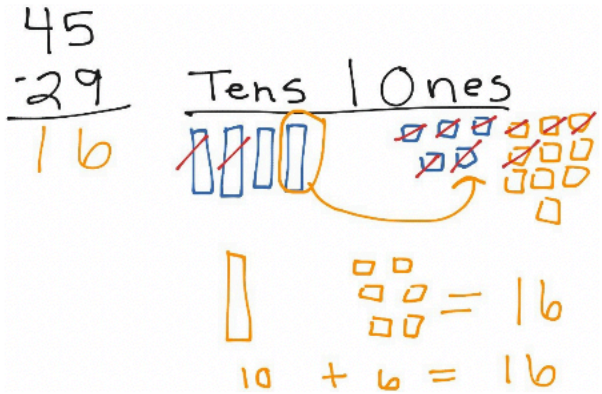
Make ten strategy *Progression should be crossing one ten, crossing more than one ten, crossing the hundreds.*	 34—28 Use a bead bar or bead strings to model counting to next ten and the rest.	 Use a number line to count on to next ten and then the rest.	93—76 = 17

Column subtraction without regrouping (friendly numbers)	 47—32 —  Use base 10 or Numicon to model	 Calculations 54 -22 32 Darw representations to support under-standing	47−24=23 40+7 −20+4 20+3 Intermediate step may be needed to lead to clear subtraction under-standing. 

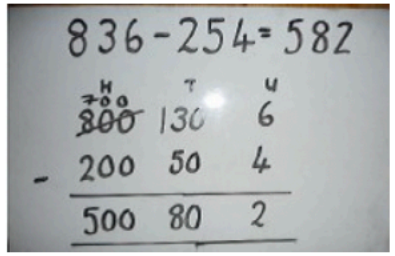
Column subtraction with regrouping



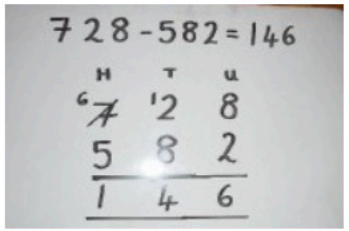
Begin with base 10 or Numicon. Move to pv counters, modelling the exchange of a ten into tten ones. Use the phrase ‘take and make’ for exchange.



Children may draw base ten or PV counters and cross off.

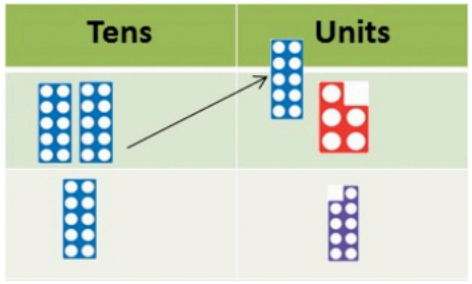


Begin by parti-tioning into pv columns

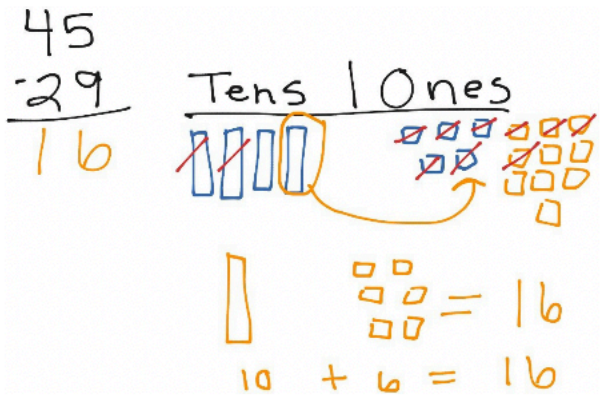


Then move to formal method.

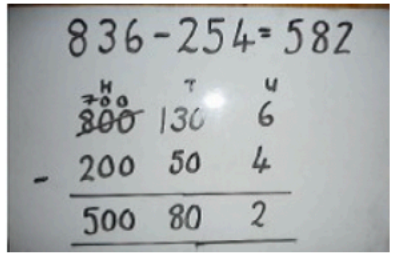
Column subtraction with regrouping



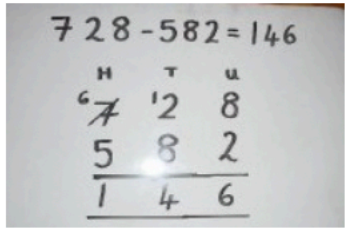
Begin with base 10 or Numicon. Move to pv counters, modelling the exchange of a ten into tten ones. Use the phrase 'take and make' for exchange.



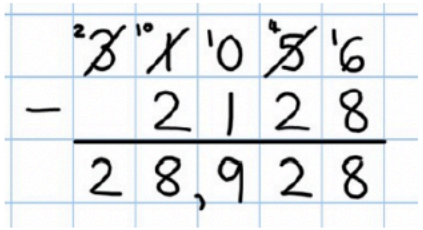
Children may draw base ten or PV counters and cross off.

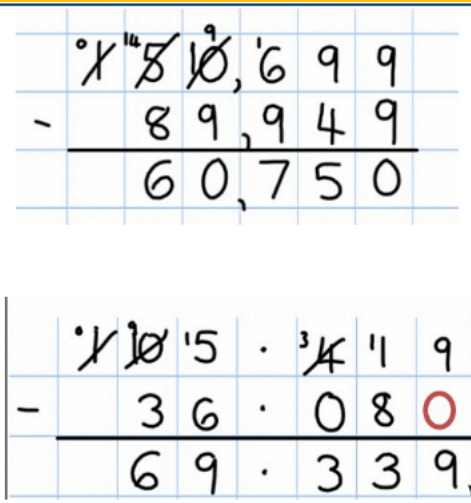


Begin by partitioning into pv columns

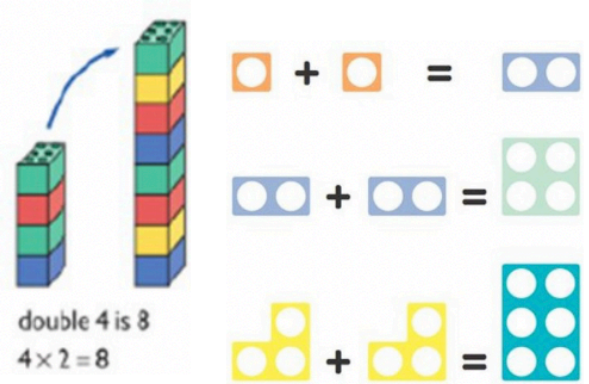
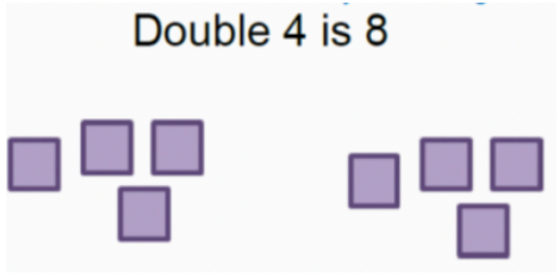
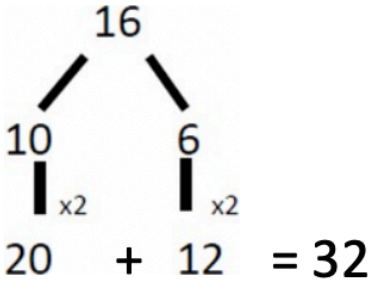


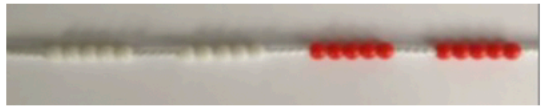
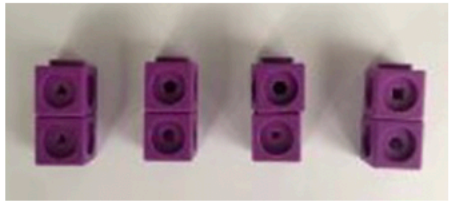
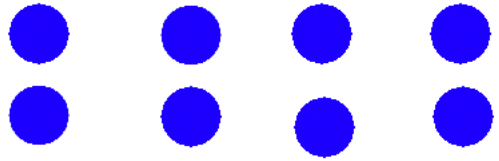
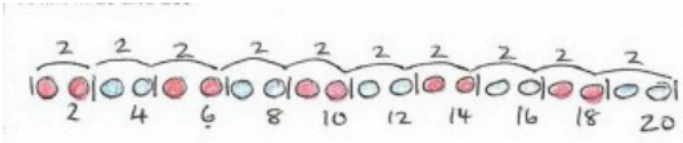
Then move to formal method.

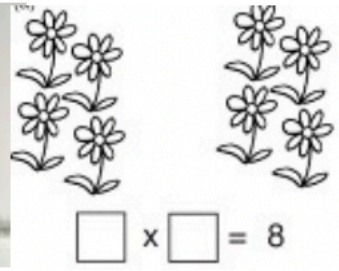
Year 5- Subtract with at least 4 dig-its, including money and measures. *Subtract with decimal values, including mixtures of integers and decimals and aligning the decimal*	As Year 4	Children to draw pv counters and show their exchange—see Y3	 Use zeros for place-holders.

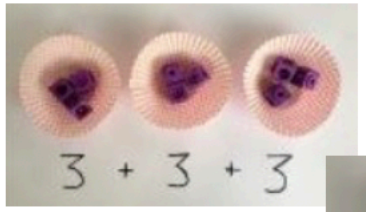
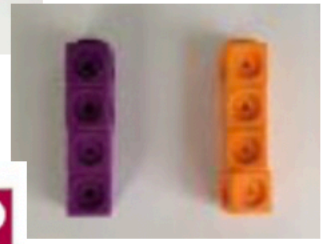
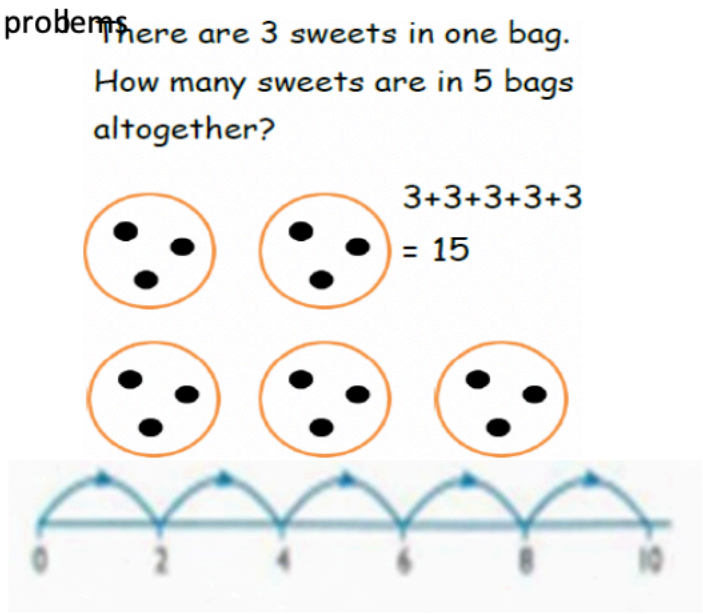
Year 6—Subtract with increasingly large and more complex numbers and decimal values.			

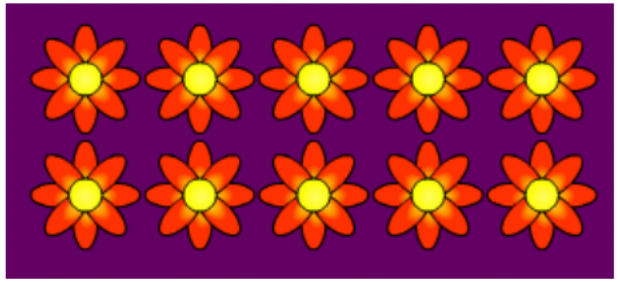
Multiplication

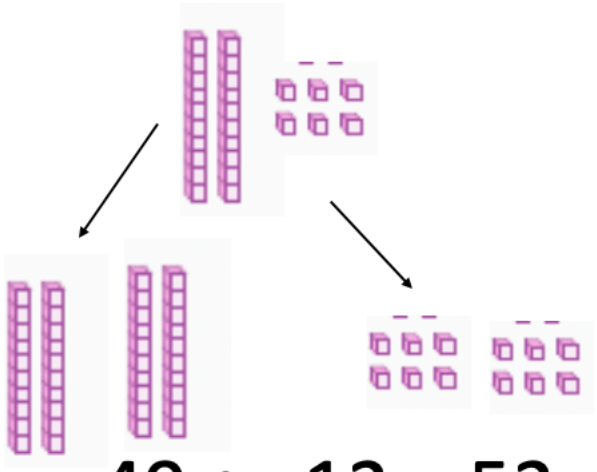
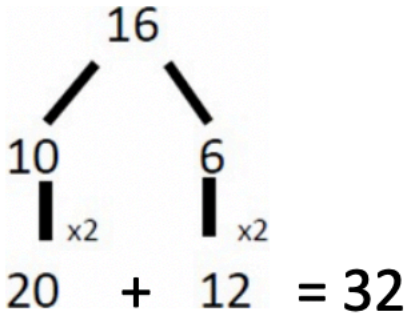
Doubling	Use practical activities using manip-ultives including cubes and Numicon to demonstrate doubling 	Draw pictures to show how to double numbers 	Partition a number and then double each part before recombining it back together. 

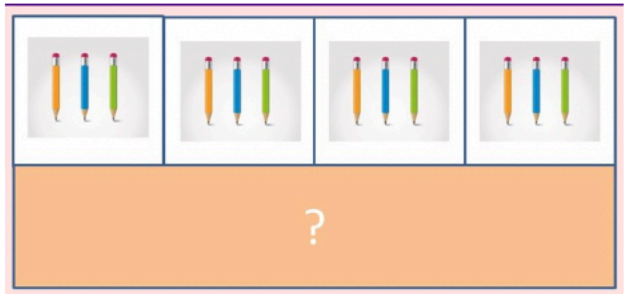
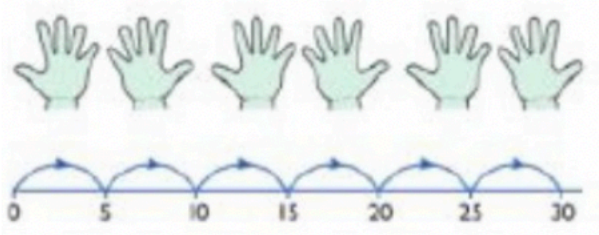
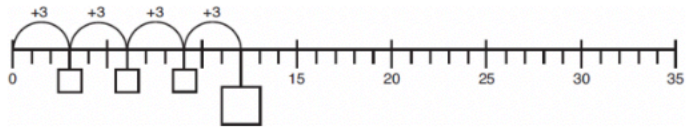
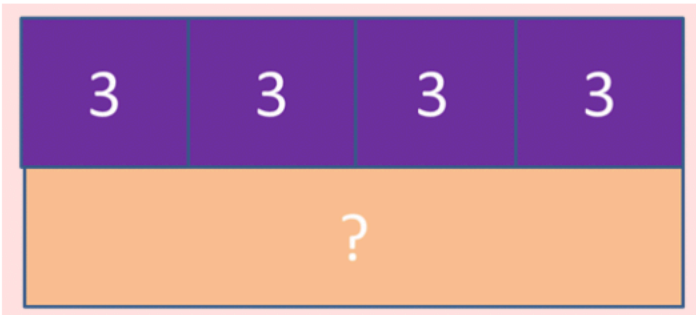
Counting in multiples	Count the groups as children are skip counting, children may use their fingers as they are skip counting.  	 Children make representations to show counting in multiples. 	Count in multiples of a number aloud. Write sequences with multiples of numbers. 2, 4, 6, 8, 10 5, 10, 15, 20, 25 , 30

Making equal groups and counting the total	  Use manipulatives to create equal groups.	Draw  to show 2 x 3 = 6 Draw and make representations	2 x 4 = 8

Repeated addition	   Use different objects to add equal groups	Use pictorial including number lines to solve problems 	Write addition sentences to describe objects and pictures. 

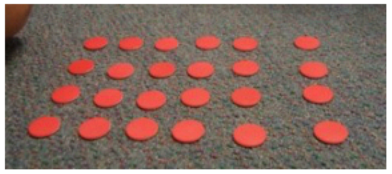
Understanding arrays	Use objects laid out in arrays to find the answers to 2 lots 5, 3 lots of 2 etc. 	Draw representations of arrays to show understanding	3 x 2 = 6 2 x 5 = 10

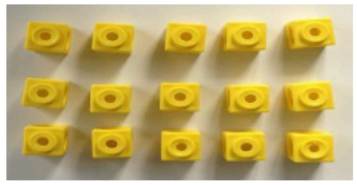
Doubling	Model doubling using dienes and PV counters.  40 + 12 = 52	Draw pictures and representations to show how to double numbers	Partition a number and then double each part before recombining it back together. 

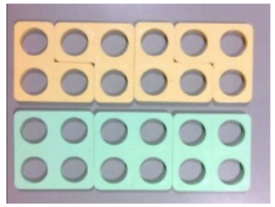
Counting in multiples of 2, 3, 4, 5, 10 from 0 (repeated addition)	Count the groups as children are skip counting, children may use their fingers as they are skip counting. Use bar models.  5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 = 40  	Number lines, counting sticks and bar models should be used to show representation of counting in multiples.   	Count in multiples of a number aloud. Write sequences with multiples of numbers. 0, 2, 4, 6, 8, 10 0, 3, 6, 9, 12, 15 0, 5, 10, 15, 20, 25 , 30 $4 \times 3 = \square$

Multiplication is commutative

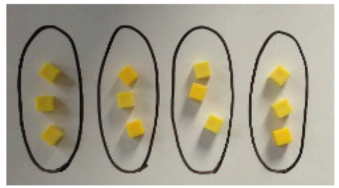
Create arrays using counters and cubes and Numicon.

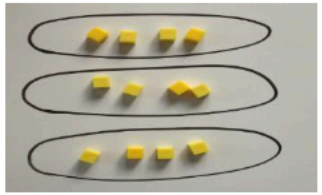




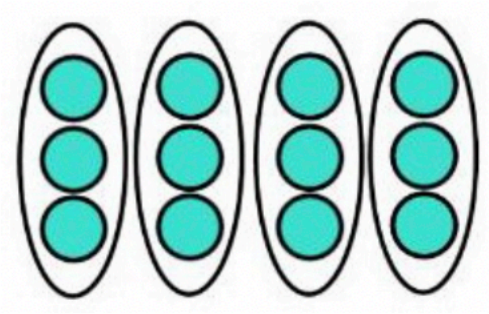


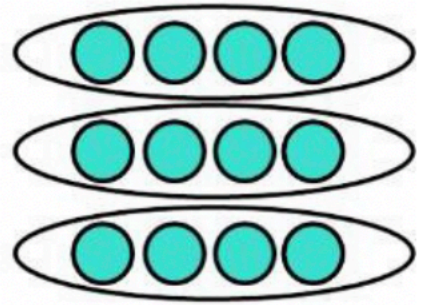
Pupils should understand that an array can represent different equations and that, as multiplication is commutative, the order of the multiplication does not affect the answer.





Use representations of arrays to show different calculations and explore commutativity.





$12 = 3 \times 4$

$12 = 4 \times 3$

Use an array to write multiplication sentences and reinforce repeated addition.

$5 + 5 + 5 = 15$

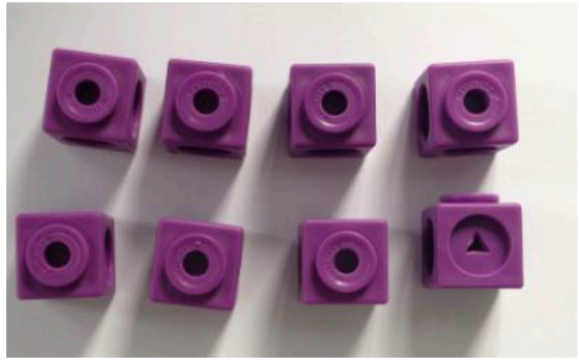
$3 + 3 + 3 + 3 + 3 = 15$

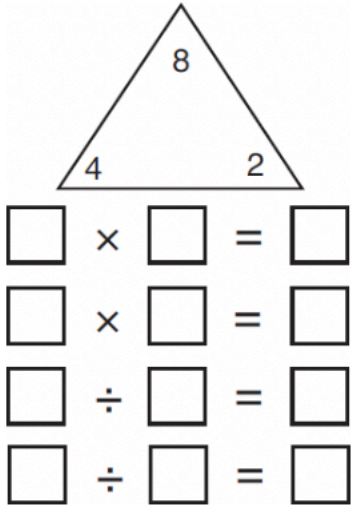
$5 \times 3 = 15$

$3 \times 5 = 15$

Using the Inverse

This should be taught alongside division, so pupils learn how they work alongside each other.





2 x 4 = 8

4 x 2 = 8

8 ÷ 2 = 4

8 ÷ 4 = 2

8 = 2 x 4

8 = 4 x 2

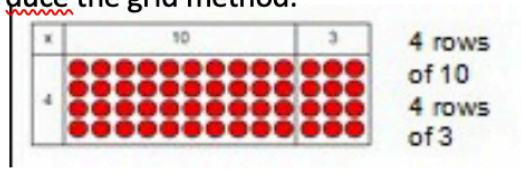
2 = 8 ÷ 4

4 = 8÷ 2

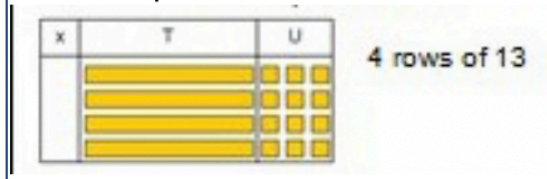
Show all 8 related fact family sentences.

Grid method

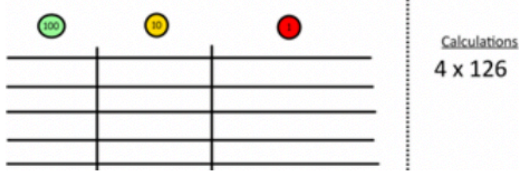
Show the links with arrays to first introduce the grid method.



Move onto base ten to move towards a more compact method.

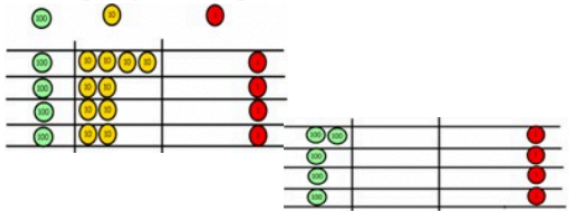


Move on to place value counters to show how we are finding groups of a number. We are multiplying by 4 so we need 4 rows



Fill each row with 126

Add up each column, starting with the ones making any exchanges needed

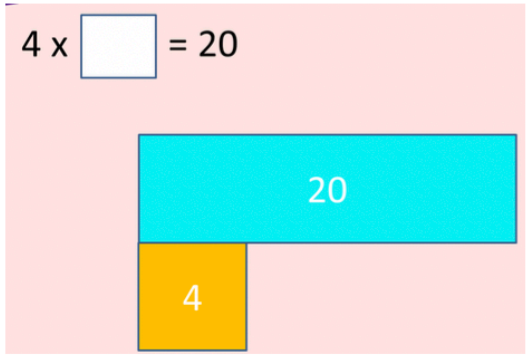


Then you have your answer.

Children can represent their work with place value counters in a way that they understand.

They can draw the counters using colours to show different amounts or just use the circles in the different columns to show their thinking as shown below.

Bar model are used to explore missing numbers



Start with multiplying by one digit numbers and showing the clear addition alongside the grid.

×	30	5
7	210	35

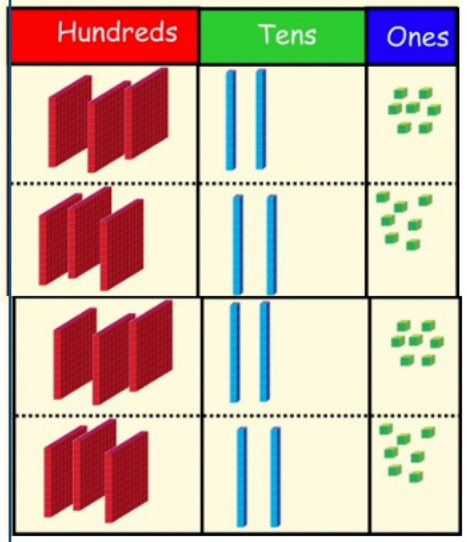
210 + 35 = 245

Moving forward, multiply by a 2 digit number showing the different rows within the grid method.

	10	8
10	100	80
3	30	24

Column multiplication

Children can continue to be supported by place value counters at the stage of multiplication. This initially done where there is no regrouping. 321 x 2 = 642

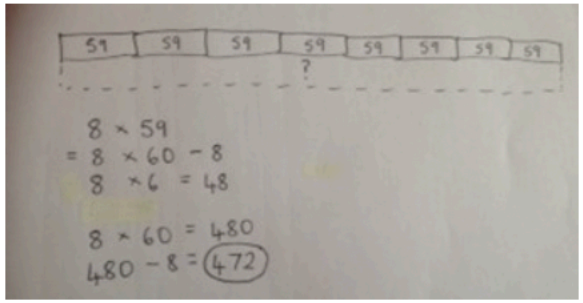


It is important at this stage that they always multiply the ones first.

The corresponding long multiplication is modelled alongside

x	300	20	7
4	1200	80	28

The grid method my be used to show how this relates to a formal written method.

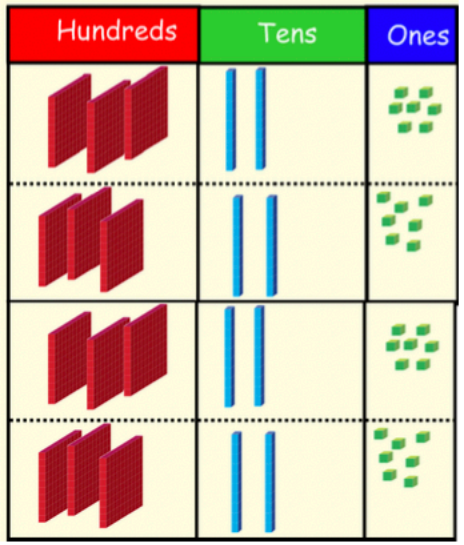


Bar modelling and number lines can support learners when solving problems with multiplication alongside the formal written methods.

```
  327
x   4
-----
  28
  80
1200
-----
1308
```

This may lead to a compact method.

Column Multiplication for 3 and 4 digits x 1 digit.

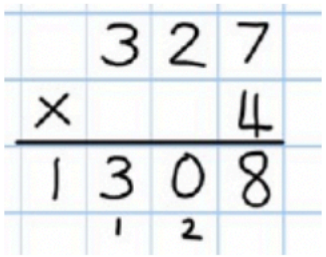


It is important at this stage that they always multiply the ones first.

Children can continue to be supported by place value counters at the stage of multiplication. This initially done where there is no regrouping. 321 x 2 = 642

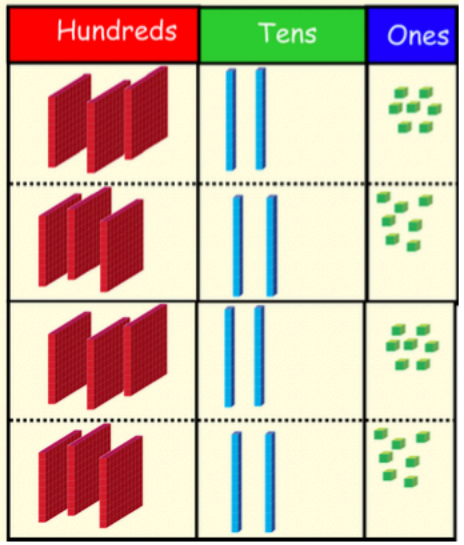
x	300	20	7
4	1200	80	28

$$\begin{array}{r} 327 \\ \times \quad 4 \\ \hline 28 \\ 80 \\ 1200 \\ \hline 1308 \end{array}$$



This will lead to a compact method.

Column Multiplication for 3 and 4 digits x 1 digit.

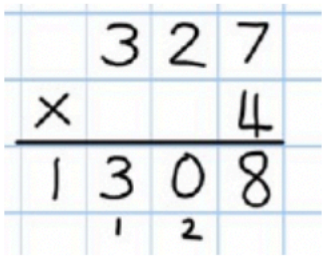


It is important at this stage that they always multiply the ones first.

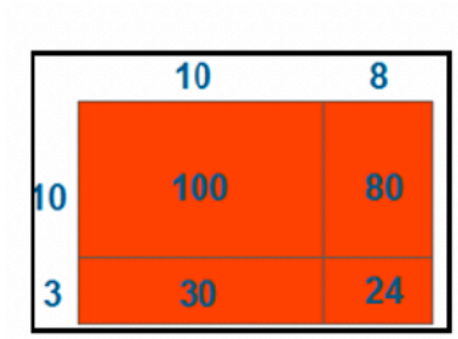
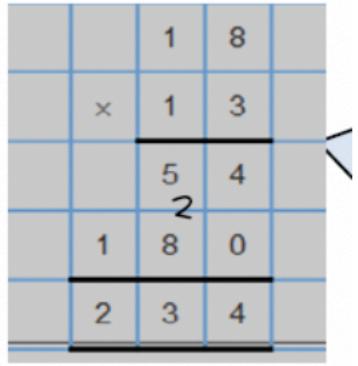
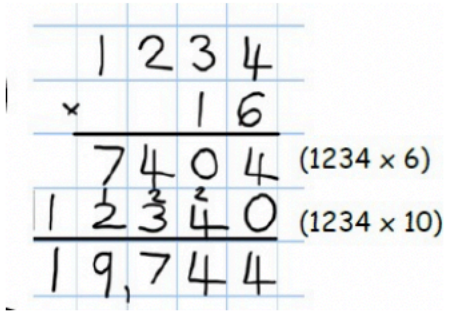
Children can continue to be supported by place value counters at the stage of multiplication. This initially done where there is no regrouping. 321 x 2 = 642

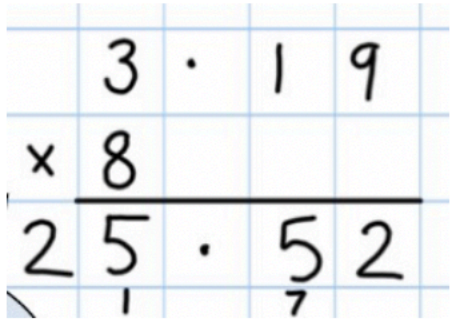
x	300	20	7
4	1200	80	28

$$\begin{array}{r} 327 \\ \times \quad 4 \\ \hline 28 \\ 80 \\ 1200 \\ \hline 1308 \end{array}$$

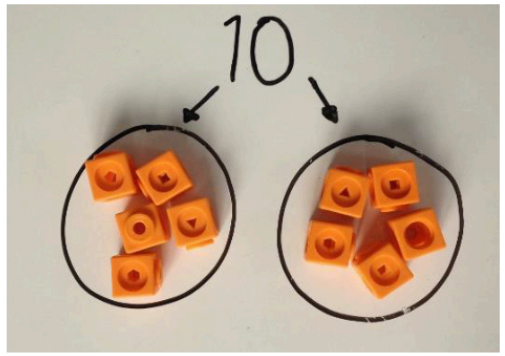
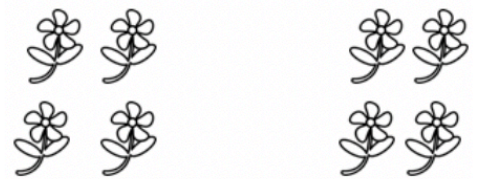
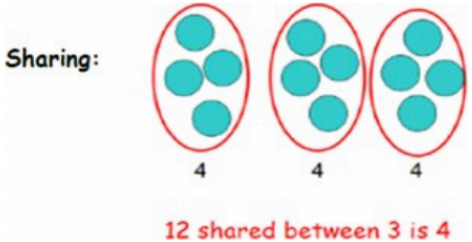


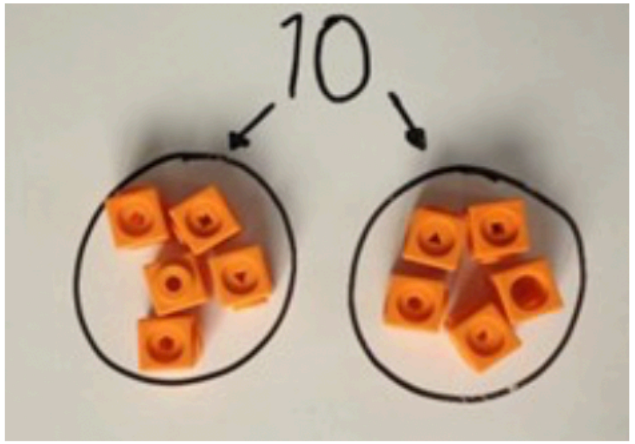
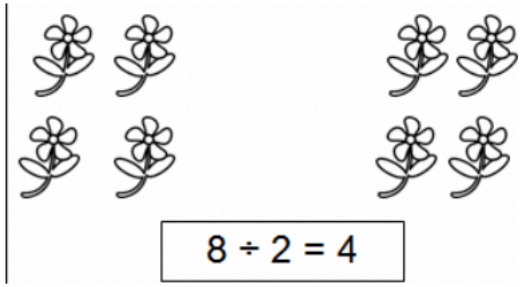
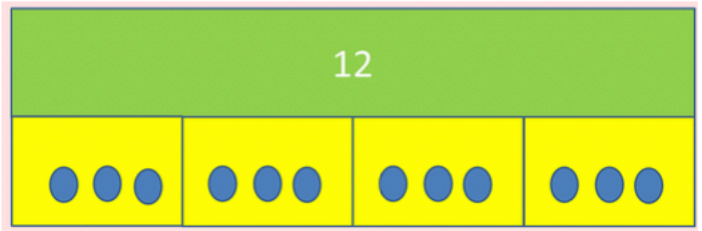
This will lead to a compact method.

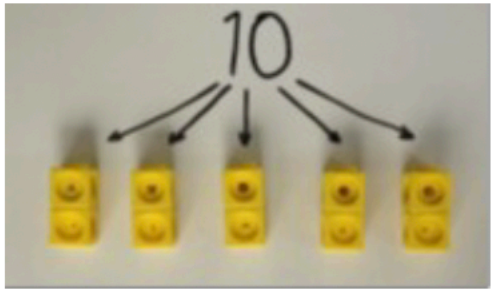
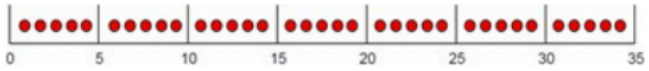
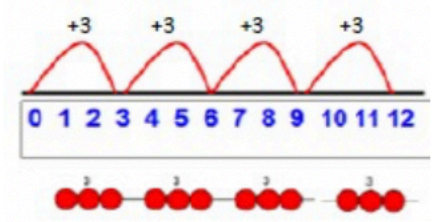
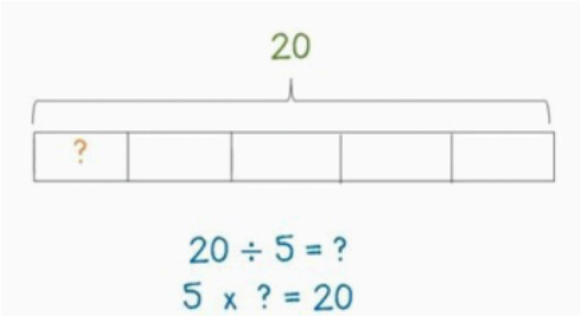
Column multiplication	Manipulatives may still be used with the corresponding long multiplication modelled alongside.	 Continue to use bar modelling to support problem solving	 18 x 3 on the first row (8 x 3 =24, carrying the 2 for 20, then 1 x 3) 18 x 10 on the 2nd row. Show multiplying by 10 by putting zero in units first 

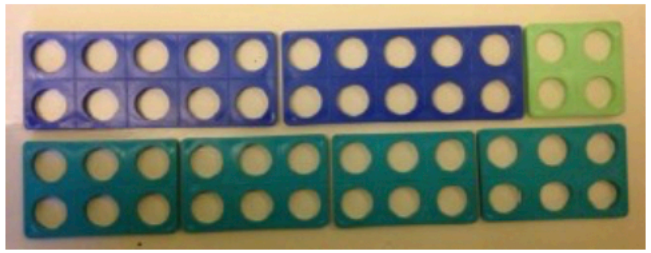
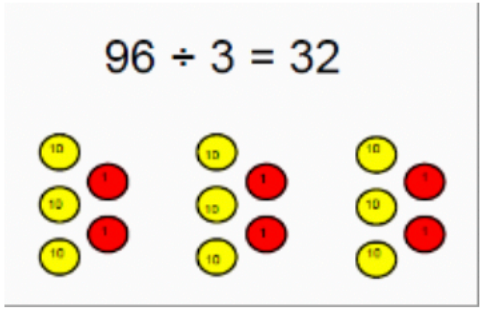
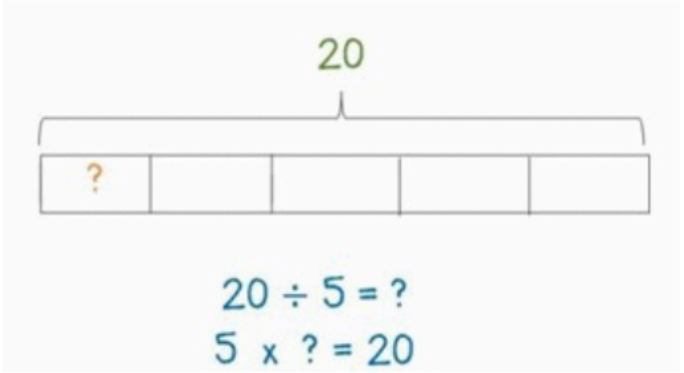
Multiplying decimals up to 2 decimal places by a single digit.			Remind children that the single digit belongs in the units column. Line up the decimal points in the question and the answer. 

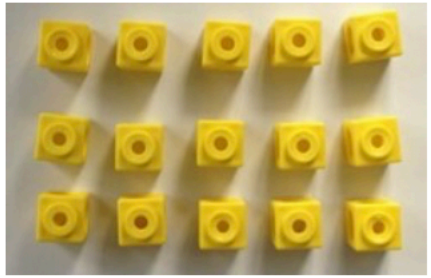
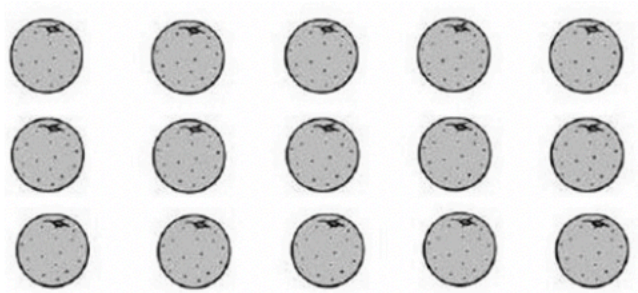
Division

Division as sharing *Use Gordon ITPs for modelling*	   I have 10 cubes, can you share them equally in 2 groups?	Children use pictures or shapes to share quantities.  8 shared between 2 is 4  	12 shared between 3 is 4

Division as sharing	 I have 10 cubes, can you share them equally in 2 groups?	Children use pictures or shapes to share quantities.  Children use bar modelling to show and support understanding.  12 ÷ 4 = 3	12 ÷ 3 = 4

Division as grouping	Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding.   	Use number lines for grouping  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.  	28 ÷ 7 = 4 Divide 28 into 7 groups. How many are in each group?

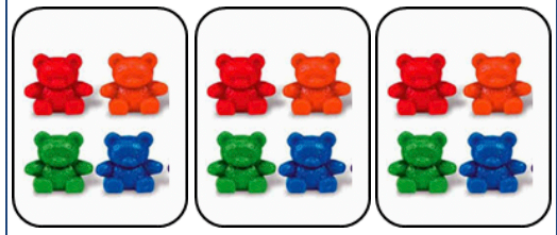
Division as grouping	Use cubes, counters, objects or place value counters to aid understanding.  24 divided into groups of 6 = 4 	Continue to use bar modelling to aid solving division problems. 	How many groups of 6 in 24? 24 ÷ 6 = 4

Division with arrays	 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	Draw an array and use lines to split the array into groups to make multiplication and division sentences 	Find the inverse of multiplication and division sentences by creating eight linking number sentences. 7 x 4 = 28 4 x 7 = 28 28 ÷ 7 = 4 28 ÷ 4 = 7 28 = 7 x 4 28 = 4 x 7 4 = 28 ÷ 7 7 = 28 ÷ 4

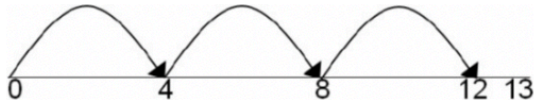
Division with remainders.

14 ÷ 3 =

Divide objects between groups and see how much is left over

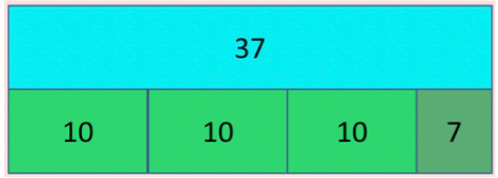


Jump forward in equal jumps on a number line then see how many more you need to jump to find a remainder.

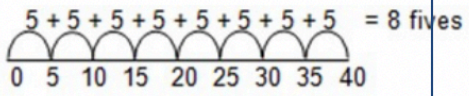


Draw dots and group them to divide an amount and clearly show a remainder.

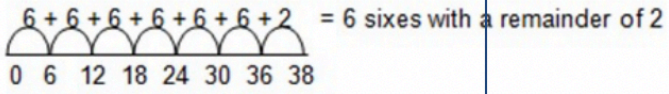
Use bar models to show division with remainders.



Example without remainder:
40 ÷ 5
Ask "How many 5s in 40?"



Example with remainder:
38 ÷ 6



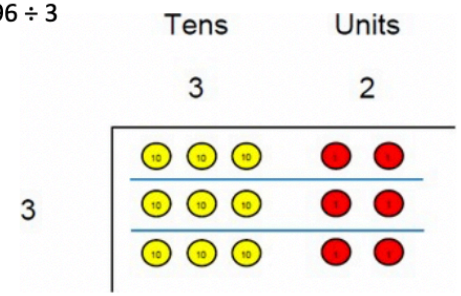
For larger numbers, when it becomes inefficient to count in single multiples, bigger jumps can be recorded using known facts.

Complete written divisions and show the remainder using r.

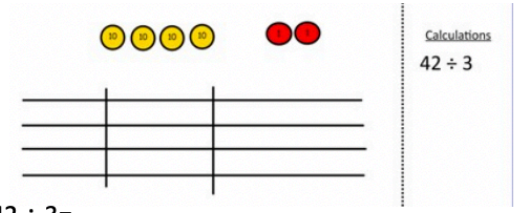
Divide at least 3 digit numbers by 1 digit.

Short Division

96 ÷ 3

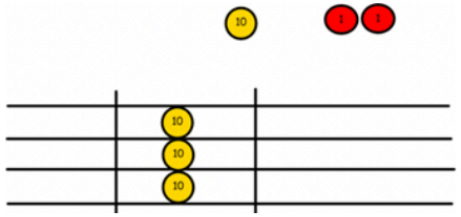


Use place value counters to divide using the bus stop method alongside

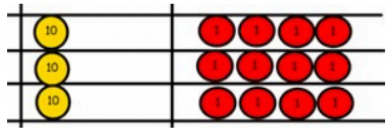


42 ÷ 3=

Start with the biggest place value, we are sharing 40 into three groups. We can put 1 ten in each group and we have 1 ten left over.

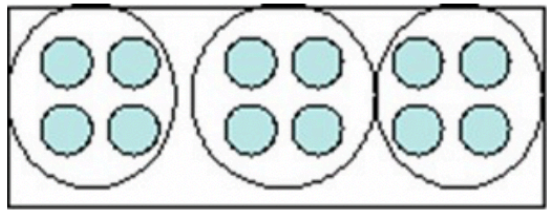


We exchange this ten for ten ones and then share the ones equally among the groups.



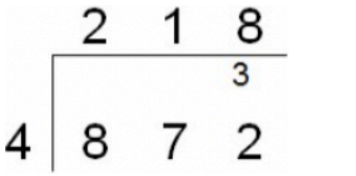
We look how much in 1 group so the answer is 14.

Students can continue to use drawn diagrams with dots or circles to help them divide numbers into equal groups.

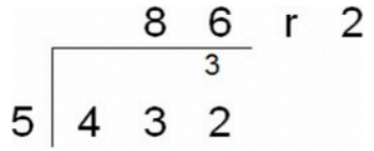


Encourage them to move towards counting in multiples to divide more efficiently.

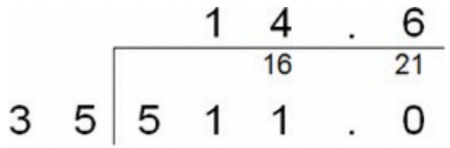
Begin with divisions that divide equally with no remainder.

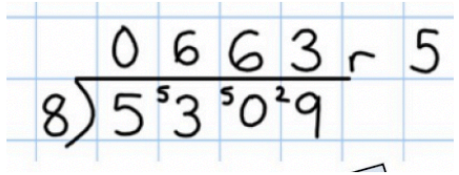


Move onto divisions with a remainder.



Finally move into decimal places to divide the total accurately.





Step 1—a remainder in the ones

```
    h  t  o
      0 4 1 R1
   ---------
4 ) 1 6 5
```

4 does not go into 1 (hundred). So combine the 1 hundred with the 6 tens (160).

4 goes into 16 four times.

4 goes into 5 once, leaving a remainder of 1.

```
     th h  t  o
        0 4 0 0 R7
   -------------
8 ) 3 2 0 7
```

8 does not go into 3 of the thousands. So combine the 3 thousands with the 2 hundreds (3,200).

8 goes into 32 four times (3,200 ÷ 8 = 400)
8 goes into 0 zero times (tens).
8 goes into 7 zero times, and leaves a remainder of 7.

```
    h  t  o
      0 6 1
   ---------
4 ) 2 4 7
    - 4
   -----
      3
```

When dividing the ones, 4 goes into 7 one time. Multiply 1 × 4 = 4, write that four under the 7, and subract. This finds us the remainder of 3.

Check: 4 × 61 + 3 = 247

```
     th h  t  o
        0 4 0 2
   -------------
4 ) 1 6 0 9
    - 8
   -----
      1
```

When dividing the ones, 4 goes into 9 two times. Multiply 2 × 4 = 8, write that eight under the 9, and subract. This finds us the remainder of 1.

Check: 4 × 402 + 1 = 1,609

Long Division

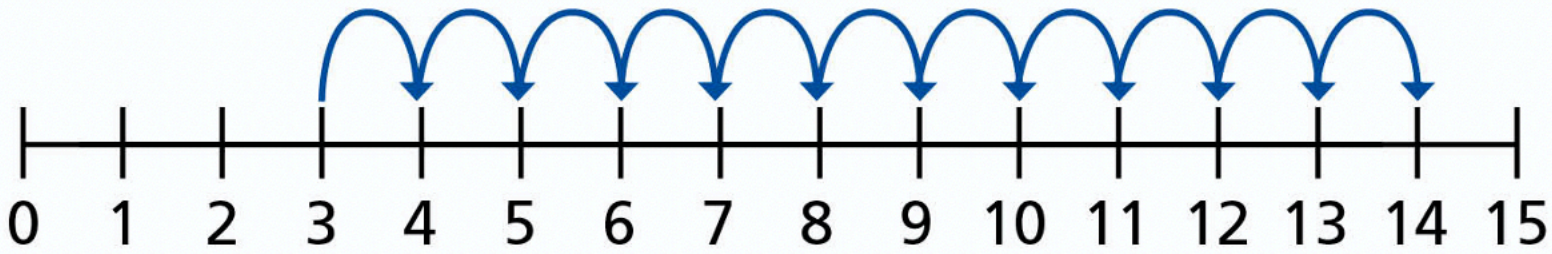
Show

What does this look like in lessons?

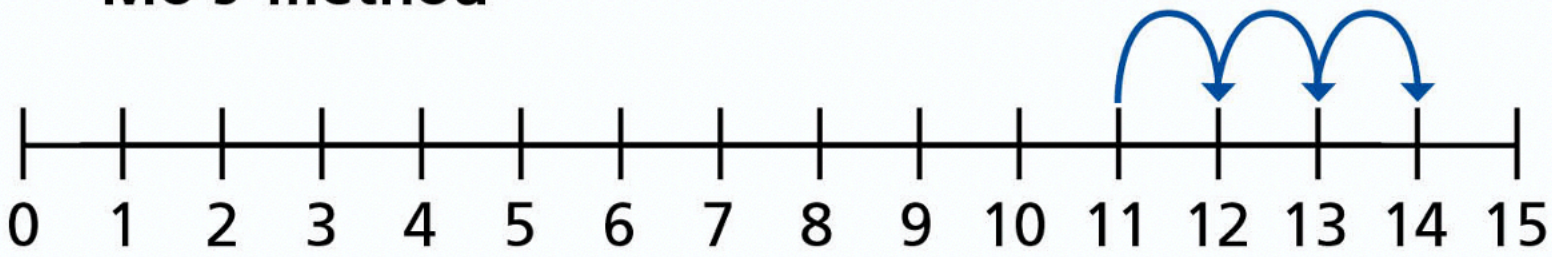
Year 1

3 Ron and Mo are working out 3 + 11 on a number line.

Ron's method



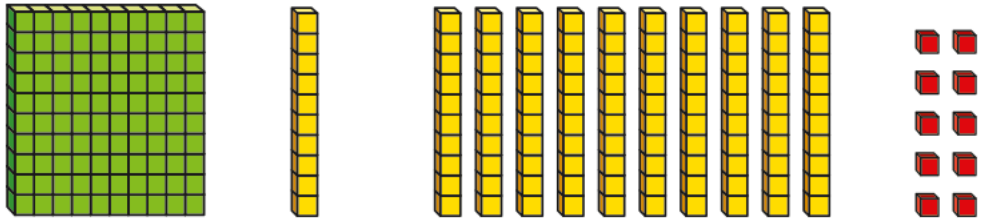
Mo's method



What is the same and what is different?

Year 2

4 Which two representations show 10?

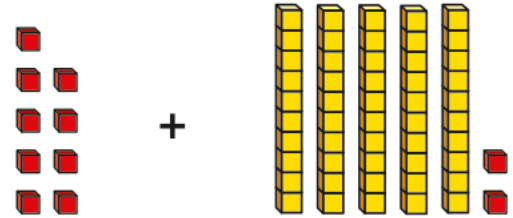


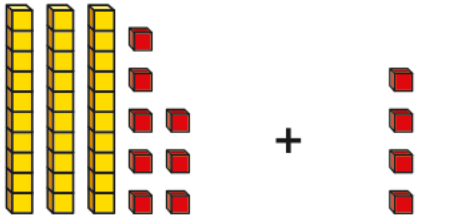
What is the same about the two representations?

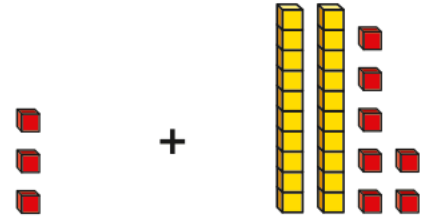
What is different?

5 Work out the additions.

a) 

c) 

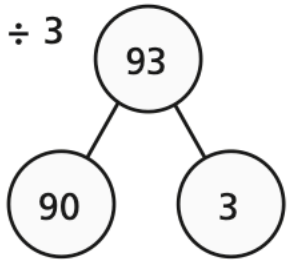
b) 

d) 

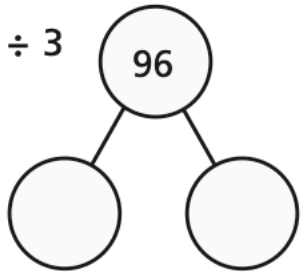
Year 3

5 Work out the divisions.

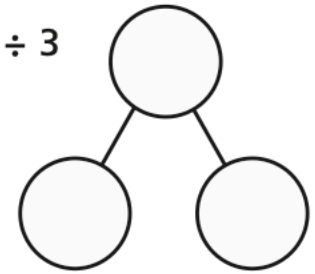
a) 93 ÷ 3



96 ÷ 3



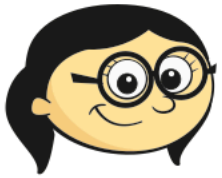
99 ÷ 3

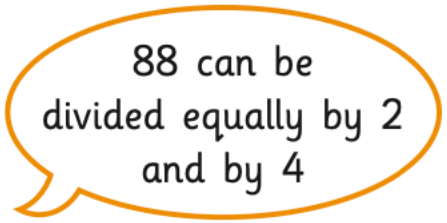


b) 82 ÷ 2 84 ÷ 2 86 ÷ 2

What do you notice?

6





Do you agree with Annie?

Explain why.

Can Annie divide 88 equally by any other 1-digit numbers?

Year 4

3 Match the numbers with a difference of $\frac{3}{4}$

3	1	2
$2\frac{3}{4}$	$\frac{1}{4}$	$\frac{9}{4}$

4 Aisha has 4 pies.

a) Aisha gives $\frac{5}{8}$ of a pie to Mo.

How many pies does Aisha have left?

b) Aisha then gives 2 pies to Jack.

Calculate the difference between how much pie Aisha now has and how much pie Mo has.

Year 5

6 Mr Hall has written these subtractions on the board.

45,541 – 25,865

Rosie's workings

$$\begin{array}{r} 25865 \\ -\ 45541 \\ \hline 20324 \end{array}$$

68,945 – 34,758

Whitney's workings

$$\begin{array}{r} 68945 \\ -\ 34758 \\ \hline 34213 \end{array}$$

Explain the mistakes that Rosie and Whitney have made.

7 Complete the subtractions.

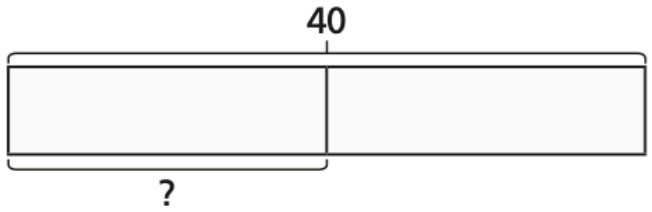
a) 10,004 – 9,995 **b)** 10,000 – 6,727 **c)** 15,923 – 9,998

How did you work this out?

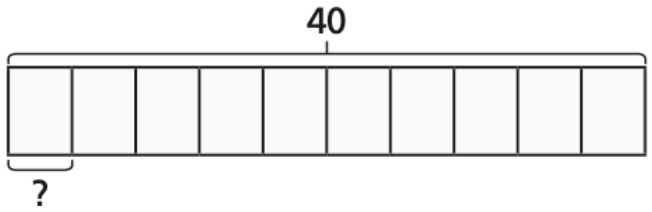
Is there another method you could use?

Year 6

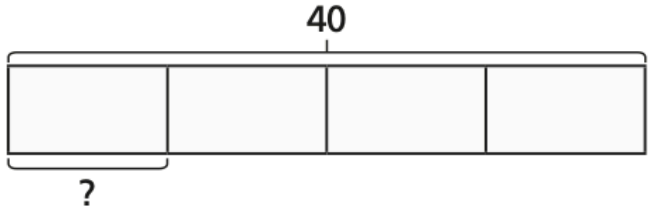
2 Match each bar model to the statement it represents.



10% of 40



25% of 40



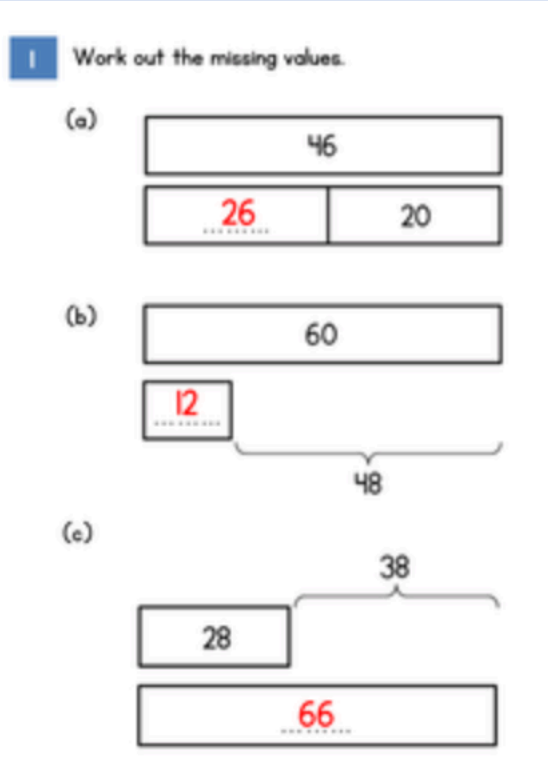
50% of 40

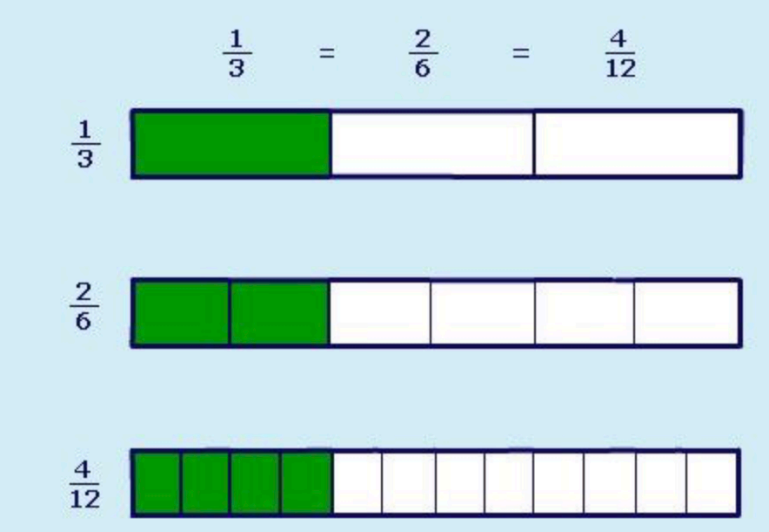
Compare answers with a partner.

Bar Models

Why bar models?

Bar models are a visual representation of a problem that helps children to break down or visualise mathematical information to solve problems.





A barrel contains 175 litres of water.

2 buckets of water are poured into the barrel.

There is now 265 litres of water in the barrel.

How much water could have been in each bucket?

How many different answers can you find?

Jess has 80 stickers.

Liam has 12 stickers.

Jess gives Liam 25 stickers.

How many more stickers than Liam does Jess have now?

Mo has 4 times as many sweets as Gill.

Mo eats $\frac{3}{4}$ of his sweets.

He gives Gill $\frac{1}{3}$ of the sweets he has left.

Mo has 18 sweets left.

How many sweets does Gill have now?

In a sale there is 10% off bikes.

Hannah buys a new bike in the sale.

She pays £189

How much did the bike cost before the sale?

Key messages to take home

- Progression in understanding
- Use of manipulatives to help children gain understanding
- Bigger numbers do not equal mastery and depth of understanding
- Mastery means being able to be fluent/ reason and problem solve