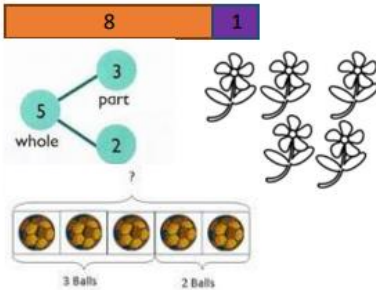




Our Vision: "To make every day count"

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Addition - Year 1

Vocabulary	Add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, balancing, part, part whole		
Objective	Concrete	Pictorial	Abstract
Combining two parts to make a whole	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. 	Use the part-part whole model as shown to move into the abstract. Include missing number questions to support varied fluency.  $8 = 5 + 3$ $5 + 3 = 8$ $8 = ? + 3$ $5 + ? = 8$



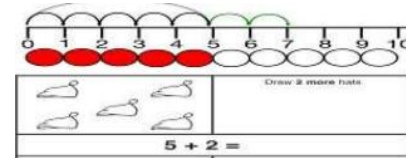
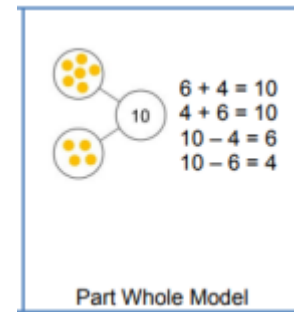
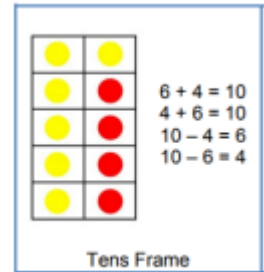
Our Vision: "To make every day count"

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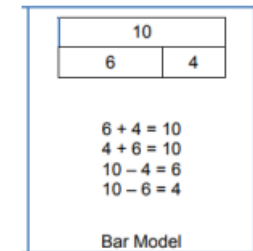
Represent and use number bonds and related subtraction facts within 20

Initially use real objects such as egg boxes.

Move onto counters and a ten frame.



Bar model and part-part whole model to be used alongside abstract



Include missing number questions:
 $10 = 6 + ?$
 $4 + ? = 10$

Emphasis should be on language
1 more than 5 is equal to 6
2 more than 5 is 7
8 is 3 more than 5

Starting at the bigger number and counting on

Start with the larger number on the bead string and then count on to the smaller number 1 by 1 to find the answer.



Start at the larger number on the number line and count on in ones



Place the larger number in your head and count on the smaller number to find your answer.

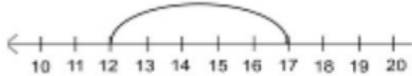
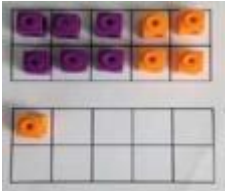
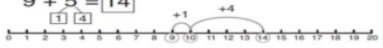
$$5 + 12 = 17$$

$$17 = 12 + 5$$



Our Vision: "To make every day count"

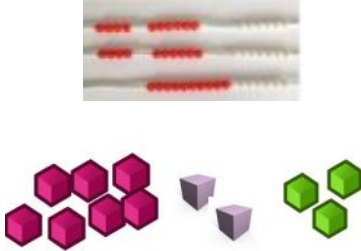
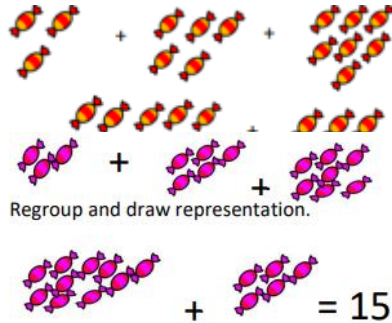
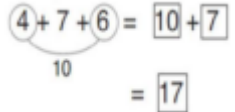
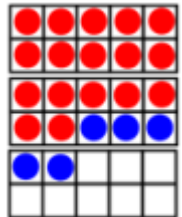
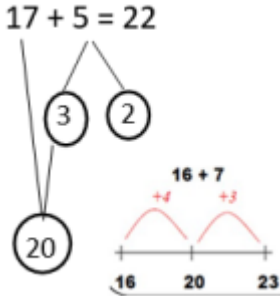
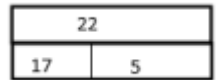
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		Or in one jump to find the answer 	
Regrouping to make 10	Start with the bigger number and use the smaller number to make 10. Use ten frames. 	Use pictures or a number line. Regroup or partition the smaller number using the part-part whole model to make 10.  $3 + 9 =$ $9 + 5 = 14$ 	$7 + 4 = 11$ If I am at 7, how many more do I need to make 10? How many more do I add on now?



Our Vision: "To make every day count"

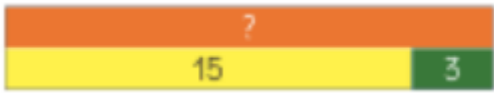
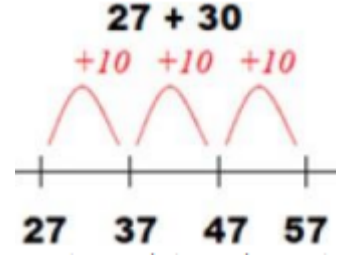
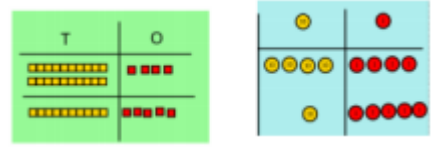
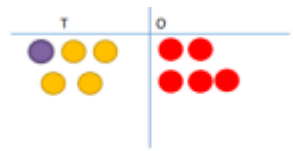
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Addition - Year 2			
Vocabulary	Add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, sum, tens, units, partition, addition, column, tens boundary		
Objective	Concrete	Pictorial	Abstract
Adding three 1-digit numbers	$4 + 7 + 6 =$  Put 4 and 6 together to make 10. Add on 7. Following on from making 10, make 10 with two of the digits (if possible) then add on the third digit.	Add together 3 groups of objects. Draw a picture and annotate the groups to make 10.  Regroup and draw representation. $4 + 7 + 6 = 17$	Combine the two numbers that make 10 and then add on the remainder. 
Adding a 2-digit number and ones	$17 + 5 = 22$  Use ten frame to make 'magic ten'. Children explore the pattern.	Use part-part whole model and number line. 	$17 + 5 = 22$ Explore related facts $17 + 5 = 22$ $5 + 17 = 22$ $22 - 17 = 5$ $22 - 5 = 17$ 



Our Vision: "To make every day count"

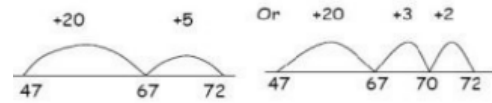
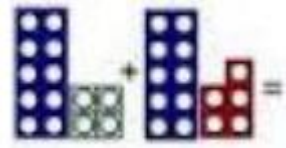
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	$17 + 5 = 22$ $27 + 5 = 32$		
Adding a 2-digit number and multiples of 10	$25 + 10 = 35$  Explore that the ones digit does not change. $50 = 30 + 20$ 	Base 10 may be used above the number line initially. The calculation will be shown alongside the number line to see the connection. $27 + 30$ 	$27 + 10 = 37$ $27 + 20 = 47$ $27 + 30 = 57$
Adding two 2-digit numbers (no regrouping)	$24 + 15 =$ Add together the ones first then add the tens. Use the Base 10 blocks first before moving onto place value counters.   Numicon can also be used.	After practically using the Base 10 blocks and place value counters, children can draw the counters to help them solve the addition.  Use number line and bridge ten using part whole if necessary.	Partitioning: $25 + 47 =$ $20 + 5 \quad 40 + 7$ $20 + 40 = 60$ $5 + 7 = 12$ $60 + 12 = 72$ Recording addition in columns supports place value and prepares for formal written methods with larger numbers.



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Base 10 may be used above the number line.

The calculation will be shown alongside the number line to see the connection.

The bar model will be used to support problem solving moving onto the generalisation that $b + c = a$. Children will focus on using abstract representation with the pictorial to support where necessary.

Toward the end of the year, children move to more formal recording using partitioning method.

$$20 + 5$$

$$40 + 7$$

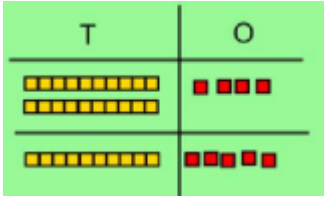
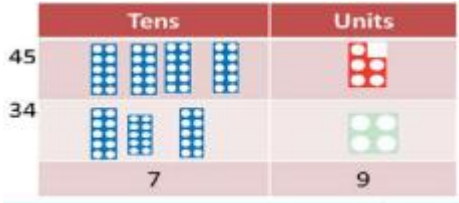
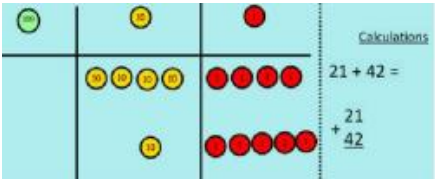
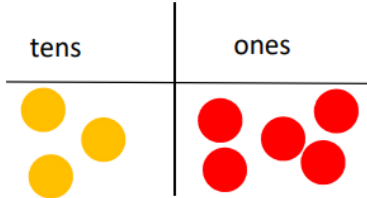
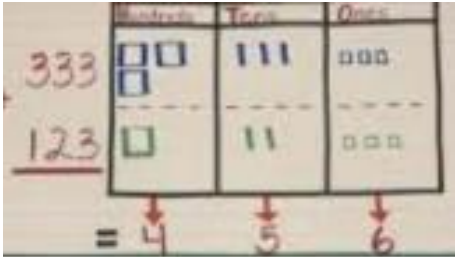
$$60 + 12$$



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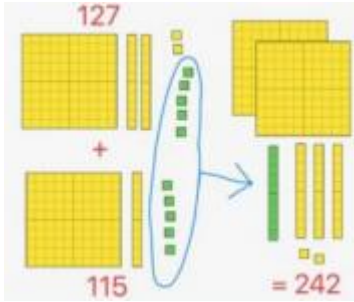
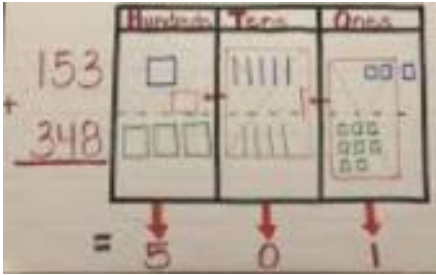
Addition - Year 3

Vocabulary	Addition, add, more, and, make, sum, total, altogether, double, near double, half, halve, tens boundary, hundreds boundary		
Objective	Concrete	Pictorial	Abstract
Add and subtract numbers with up to 3-digits, using formal written methods of columnar addition Column addition (no regrouping)	Using manipulatives (Base 10, Numicon, counters) children are to line up hundreds, tens and ones.  Add together the ones first, then the tens.  	Children are to draw, in a place value frame, the manipulatives, that they are using. Secure knowledge of representation with the place value columns. The calculation will be shown alongside the model to see the connection.  	Children move on to recording more formally. Some children may need to use the expanded method. $\begin{array}{r} 223 \\ +114 \\ \hline 337 \end{array}$ $200 + 20 + 3$ $100 + 10 + 4$ $300 + 30 + 7$



Our Vision: "To make every day count"

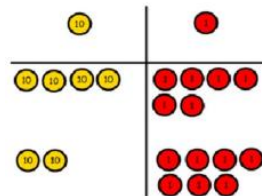
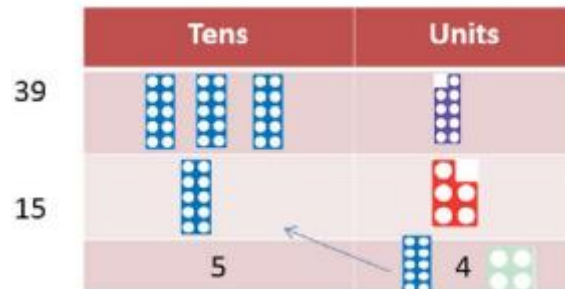
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	Children should be secure with using place value counters before moving onto pictorial. The calculation will be shown alongside the model used to see the connection.		
Add and subtract numbers with up to 3-digits, using formal written methods of columnar addition Column addition (with regrouping)	Exchange ten ones for a ten. Model using Base 10, Numicon and place value counters. 	Children can draw a representation of the grid to further support their understanding, carrying the ten underneath the line. 	Children are to begin with the abstract expanded form. For those children that are confident the below method should be used. $\begin{array}{r} 223 \\ +114 \\ \hline 337 \end{array}$ $\begin{array}{l} 200 + 20 + 3 \\ 100 + 10 + 4 \\ 300 + 30 + 7 \end{array}$



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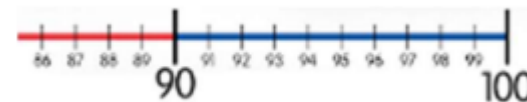
$$46 + 27 = 73$$

Estimate the answers to questions and use inverse operations to check answers

$$\begin{aligned} \text{Estimating } 98 + 17 &= \\ 100 + 20 &= 120 \end{aligned}$$



Use number lines to illustrate



estimation.

Building upon known facts and using them to illustrate the inverse and to check answers

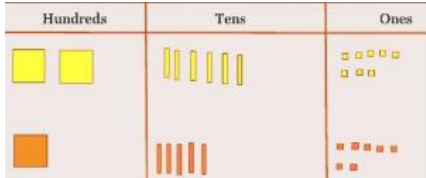
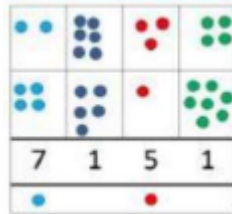
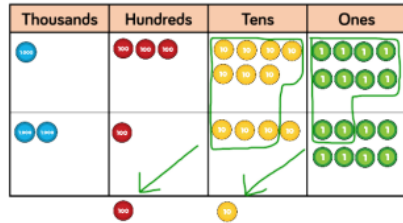
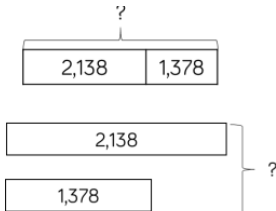
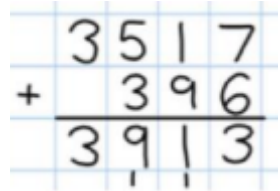
$$\begin{aligned} 98 + 18 &= 116 \\ 18 + 98 &= 116 \\ 116 - 18 &= 98 \\ 116 - 98 &= 18 \end{aligned}$$



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Addition - Year 4

Vocabulary	Addition, add, more, and, make, sum, total, altogether, double, near double, half, halve, tens boundary, hundreds boundary, decimal, decimal point		
Objective	Concrete	Pictorial	Abstract
Using formal methods of columnar addition where appropriate. Add numbers with up to 4 digits (with exchange)	Children continue to use Base 10 or place value counters to add, exchanging ten ones for a ten and ten tens for a hundred and ten hundreds for a thousand.   The calculation will be shown alongside the manipulative used to see the connection.	Children can draw a pictorial representation of the columns and place value counters to further support their learning and understanding.   	Continue from previous work to carry hundreds as well as tens. 



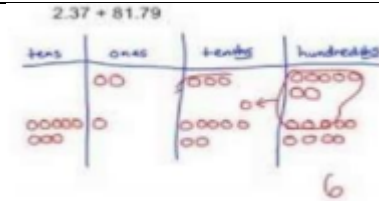
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Using formal methods of columnar addition where appropriate.

Add decimals with 2 decimal places, including money.

Introduce decimal place value counters and model exchange for addition.



As the children move one, introduce decimals with the same number of decimal places and different. Money can be used here.

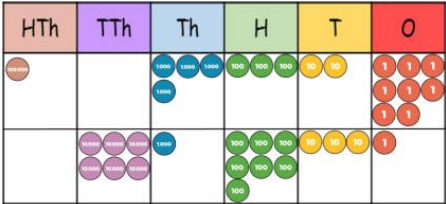
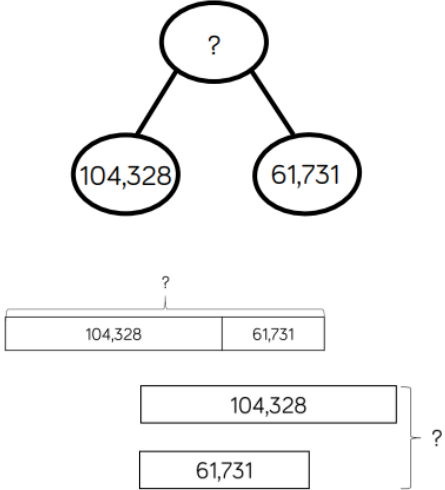
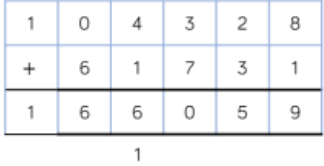
£	2	3	.	5	9
+	£	7	.	5	5
£	3	1	.	1	4



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Addition - Year 5

Vocabulary	Addition, add, more, and, make, sum, total, altogether, double, near double, half, halve, tens boundary, hundreds boundary, decimal, decimal point		
Objective	Concrete	Pictorial	Abstract
Add numbers with more than 4 digits	Continue to use place value counters or plain counters on a place value grid. At this stage, children should be encouraged to work in the abstract using the column method for larger numbers. 	Children should use part-part whole models and bar models to add larger numbers efficiently. 	Children should have abstract supported by a pictorial or concrete if needed. 



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Add decimals with 2 decimal places, including money

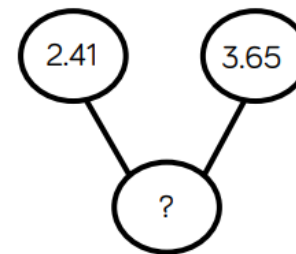
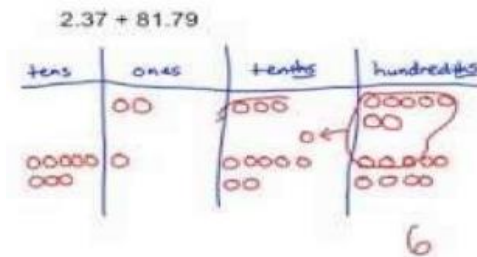
Introduce decimal place value counters and model exchange for addition.

Ones	Tenths	Hundredths
1 1 1	0.1 0.1 0.1	0.01 0.01 0.01
1 1	0.1 0.1 0.1	0.01 0.01
	0.1 0.1 0.1	0.01

1

Ones	Tenths	Hundredths
1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1
1 1	1 1 1 1 1 1 1 1	1
	1	

1



?

3.65	2.41
------	------

3.65	}	?
2.41		

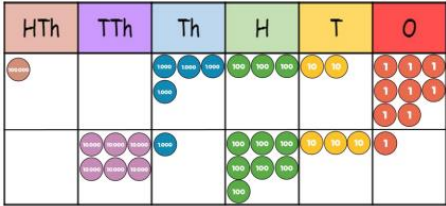
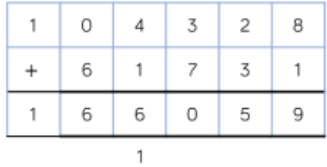
$$\begin{array}{r} 3.65 \\ + 2.41 \\ \hline 6.06 \\ 1 \end{array}$$



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Addition - Year 6

Vocabulary	Addition, add, more, and, make, sum, total, altogether, double, near double, half, halve, tens boundary, hundreds boundary, decimal, decimal point		
Objective	Concrete	Pictorial	Abstract
Add several numbers of complexity, including adding money, measure and decimals with different numbers of decimal points.	Continue to use place value counters or plain counters on a place value grid. At this stage, children should be encouraged to work in the abstract using the column method for larger numbers. 	Children should use part-part whole models and bar models to add larger numbers efficiently. 	Children should have abstract supported by a pictorial or concrete if needed. 

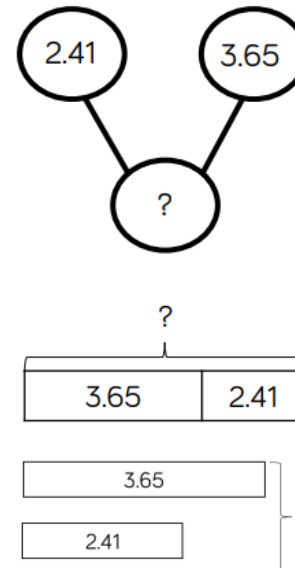
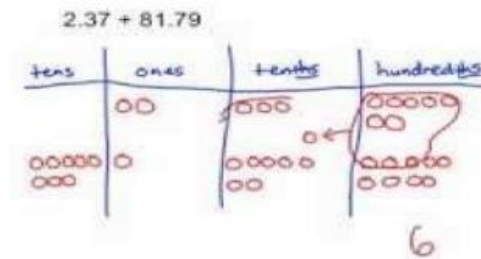
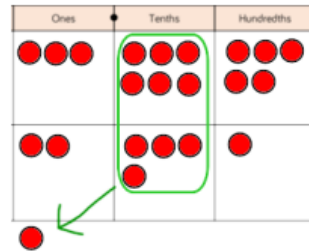
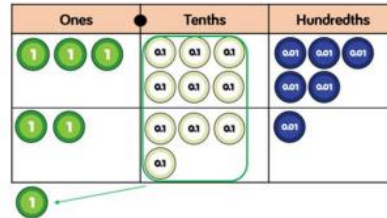


Our Vision: "To make every day count"

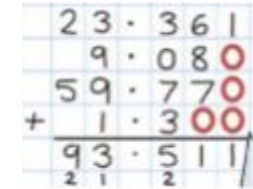
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Add several numbers of complexity, including adding money, measure and decimals with different numbers of decimal points.

Introduce decimal place value counters and model exchange for addition.



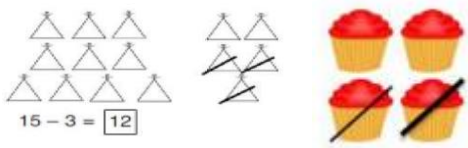
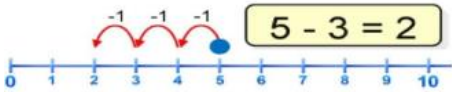
Insert zeros for place holders.





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Subtraction - Year 1			
Vocabulary	Equal to, take, take-away, less, minus, subtract, leaves, distance between, how many more, how many fewer/less than, most, least, count back, how many left, how much less is ...		
Objective	Concrete	Pictorial	Abstract
Subtract 1-digit and 2-digit numbers to 20, including 0. Taking away ones	Use physical objects, counters, cubes etc. to show how objects can be taken away. $4 - 2 = 2$ $6 - 4 = 2$ 	Cross out drawn objects to show what has been taken away. 	$7 - 4 = 3$ $16 - 9 = 7$
Subtract 1-digit and 2-digit numbers to 20, including 0. Counting back	Move objects/counters away from the group, counting backwards.  Make the larger number in your subtraction. Move the beads along the bead string as you count backwards. 	Count back in ones using a number line.  line. Start at the bigger number and count back the smaller number showing the jumps on the number line.	Put 13 in your head, count back 4. What number are you at? Use your fingers to help you.

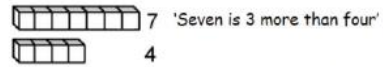


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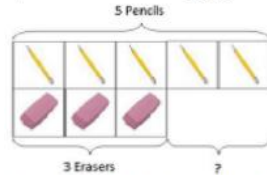
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Subtract 1-digit and 2-digit numbers to 20, including 0.
Find the difference

Compare objects and amounts.

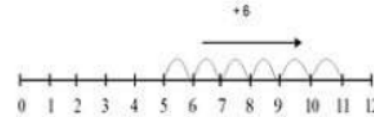


'I am 2 years older than my sister'



Lay objects to represent bar model.

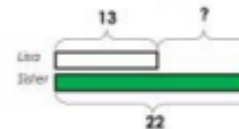
Count on using a number line to find the difference.



Draw bars to find the difference between 2 numbers.

Comparison Bar Models

Lisa is 13 years old. Her sister is 22 years old. Find the difference in age between them.



Hannah has 12 sweets and her sister has 5. How many more sweets does Hannah have than her sister?

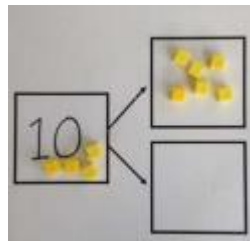
Represent and use number bonds and related subtraction facts within 20.
Part-part whole model

Link to addition.

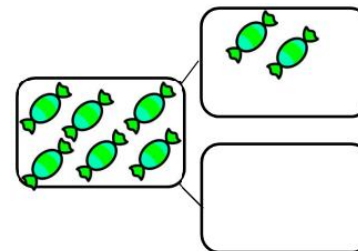
Use part-part whole model the inverse.

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

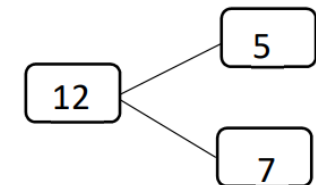
$$10 - 6 = 4$$



Use pictorial representations to show the part.



Move to using numbers within the part whole model.
Include missing number problems.



$$12 - ? = 5$$

$$7 = 12 - ?$$



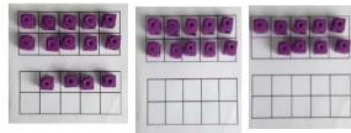
Our Vision: "To make every day count"

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Represent and use number bonds and related subtraction facts within 20.
Make 10

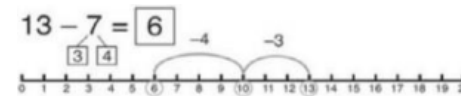
Make 14 on the ten frame. Take 4 away to make 10, then take 1 more away so that you have taken away 5.

$$14 - 9 =$$



Use a number line to count back.
Use the ten as the stopping point.

Start at 13. Take away 3 to reach 10. Then take away the remaining 4 so you have taken away 7 altogether. You have reached your



answer.

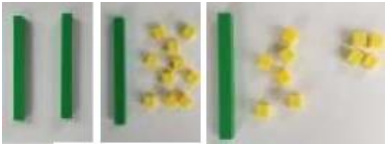
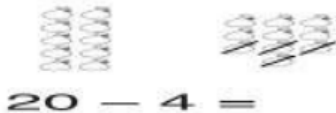
$$16 - 8 =$$

How many do we take off to reach the next 10?
How many do we have left to take off?



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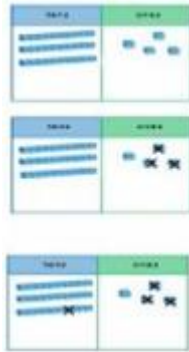
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Subtraction - Year 2			
Vocabulary	Equal to, take, take-away, less, minus, subtract, leaves, distance between, how many more, how many fewer/less than, most, least, count back, how many left, how much less is, difference, count on, strategy, partition, tens units		
Objective	Concrete	Pictorial	Abstract
Regroup a 10 into 10 ones	Use a Place Value chart to show how to change a 10 into 10 ones. 	 $20 - 4 =$	$20 - 4 = 16$
Subtract a 2-digit number and ones, a 2-digit number and tens, two 2-digit numbers. Partitioning to subtract without re-grouping	Use Base 10 to show how to partition the number when subtracting without regrouping. The calculation will be shown alongside the manipulative used. $34 - 13 = 21$	Children draw representations of Base 10 and cross off.  $43 - 21 = 22$	$43 - 21 = 22$ Recording subtraction in columns supports place value and prepares for formal written methods with larger numbers. Toward the end of the year, children move to more formal recording using partitioning method. $\begin{array}{r} 40 \text{ and } 3 \\ -20 \text{ and } 1 \\ \hline 20 \text{ and } 2 \end{array}$



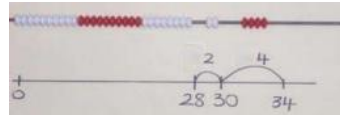
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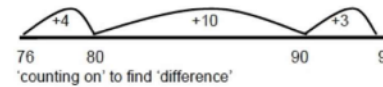


Subtract a 2-digit number and ones, a 2-digit number and tens, two 2-digit numbers.
Make 10 strategy

Use bead strings to model counting to next 10 and the rest.



Use a number line to count on to next 10 and then the rest.

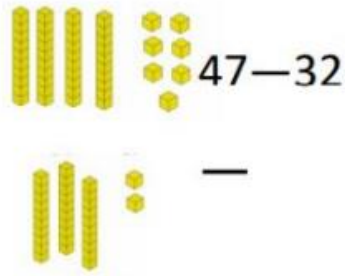
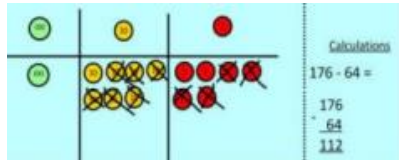
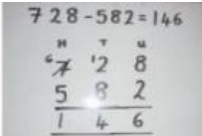


$$93 - 76 = 17$$



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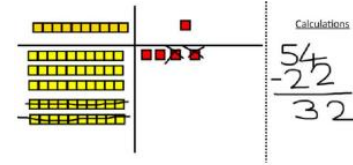
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Subtraction - Year 3			
Vocabulary	Equal to, take, take-away, less, minus, subtract, leaves, distance between, how many more, how many fewer/less than, most, least, count back, how many left, how much less is, difference, count on, strategy, partition, tens units		
Objective	Concrete	Pictorial	Abstract
Subtract numbers mentally including: 3-digit number and ones 3-digit number and tens 3-digit number and hundreds			Vary the position of the answer and question. Expose children to missing number questions and vary the missing part of the calculation. $678 = ? - 1$ $688 - 10 = ?$ $678 = ? - 10$
To subtract numbers with up to 3-digits, using formal written methods of columnar subtraction Column subtraction (without exchanging)	Use Base 10 or Numicon to model. The calculation will be shown alongside the model chosen to see the connection. 	Draw representations to support understanding. Children are to be secure with the use of Place Value counters before moving onto abstract. 	Children should begin with the expanded form. Moving onto a more formal way as below. $47 - 24 = 23$ $\begin{array}{r} 40 + 7 \\ - 20 + 4 \\ \hline 20 + 3 \end{array}$ 



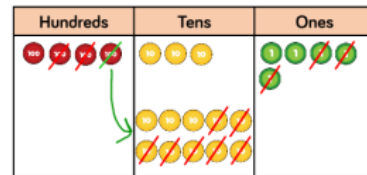
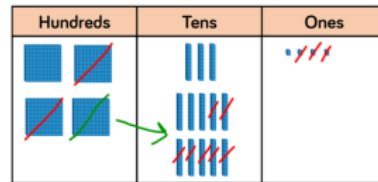
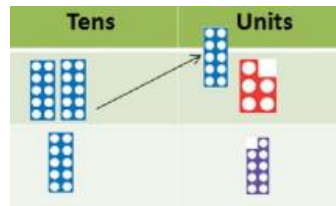
Our Vision: "To make every day count"

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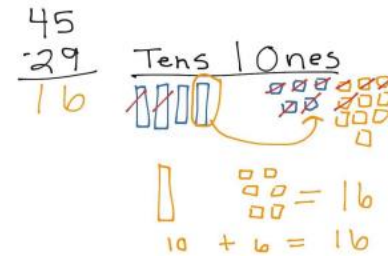


To subtract numbers with up to 3-digits, using formal written methods of columnar subtraction
Column subtraction (with exchanging)

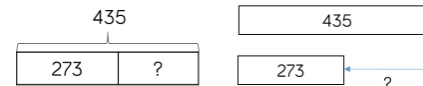
Begin with Base 10 or Numicon.
Move to Place Value counters, modelling the exchange of a ten into ten ones.



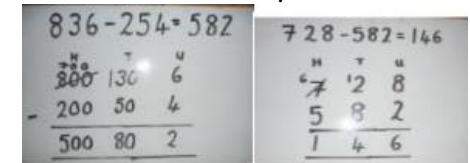
Children may draw Base 10 or Place Value counters and cross off.



When confident, children can find their own way to record the exchange/regrouping.



Children should begin with the expanded form, moving onto a more formal way as below.





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Subtraction - Year 4

Vocabulary

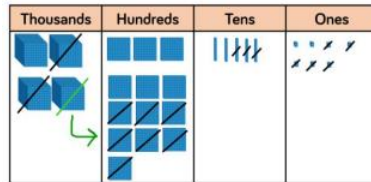
Equal to, take, take-away, less, minus, subtract, leaves, distance between, how many more, how many fewer/less than, most, least, count back, how many left, how much less is, difference, count on, strategy, partition, tens units

Objective

Subtract numbers with up to 4 digits using the formal written methods appropriate of columnar subtraction where appropriate
Subtracting tens and ones

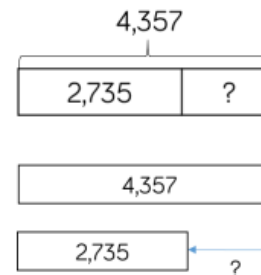
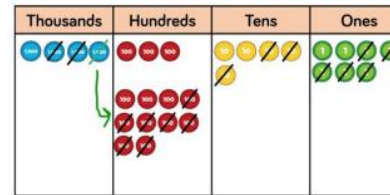
Concrete

Model process of exchange using Numicon, Base 10 and then move onto Place Value counters.
The calculation will be shown alongside the model chosen to see the connection.



Pictorial

Children to draw Place Value counters and show their exchange.



Abstract

This will lead to an understanding of subtracting any number including decimals.

$$\begin{array}{r} 3 1 \\ 4357 \\ - 2735 \\ \hline 1622 \end{array}$$

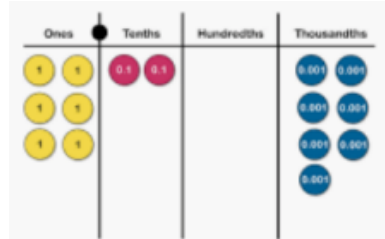


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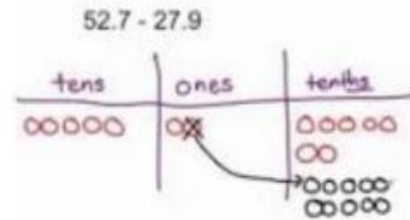
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Subtract numbers with up to 4 digits using the formal written methods appropriate of columnar subtraction where appropriate
Introduce decimal subtraction through context of money

Children to be encouraged to use counters to represent numbers and take counters away to subtract.



When confident, children can find their own way to record the exchange/regrouping.





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Subtraction - Year 5 & 6

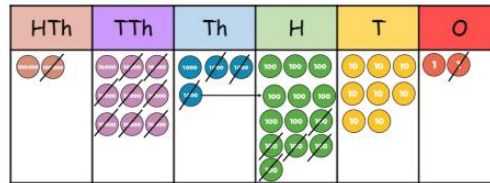
Vocabulary

Equal to, take, take-away, less, minus, subtract, leaves, distance between, how many more, how many fewer/less than, most, least, count back, how many left, how much less is, difference, count on, strategy, partition, tens units

Objective

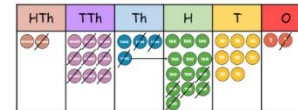
Subtract with at least 4 digits, including money and measures

Concrete

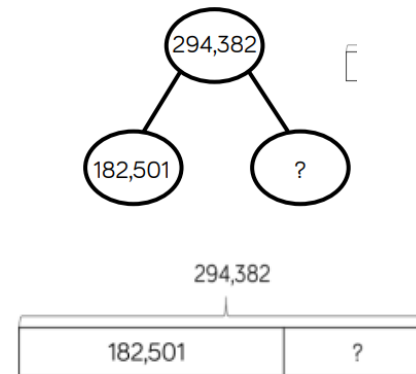


Pictorial

Children to draw Place Value counters and show their exchange.



Use bar and part-part whole models to represent questions.



Abstract

$$\begin{array}{r}
 294,382 \\
 - 182,501 \\
 \hline
 111,881
 \end{array}$$

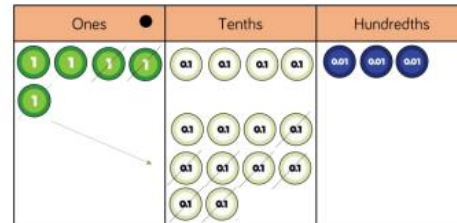


Our Vision: "To make every day count"

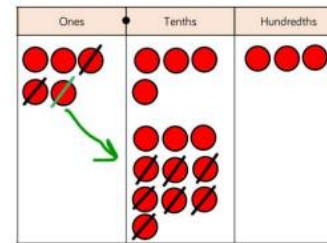
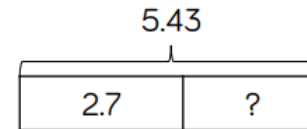
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Subtract with increasingly large and more complex numbers and decimal values (up to 3.d.p)

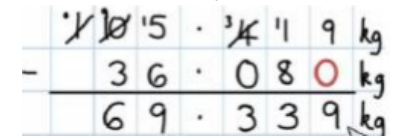
Place Value counters and plain counters on a Place Value grid are an effective manipulative when subtracting decimals with 1, 2 and 3 decimal places.



Children to draw Place Value counters and show their exchange.

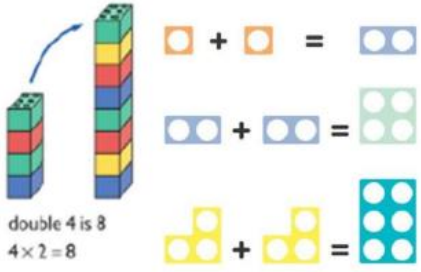
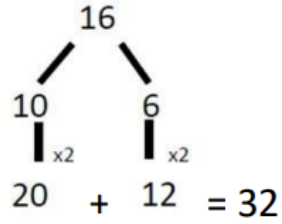
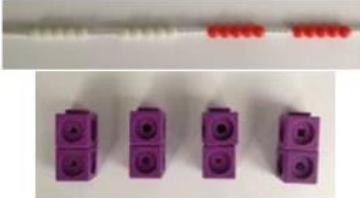
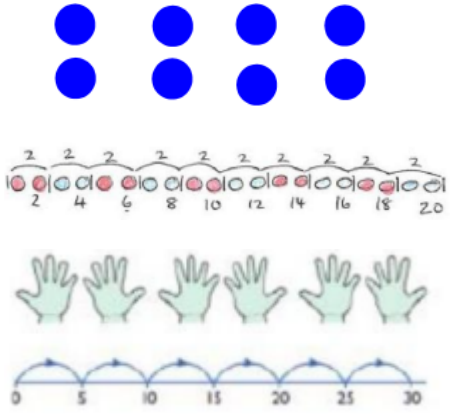


Use zeros for placeholders.



$$\begin{array}{r}
 5.43 \\
 - 2.7 \\
 \hline
 2.73
 \end{array}$$

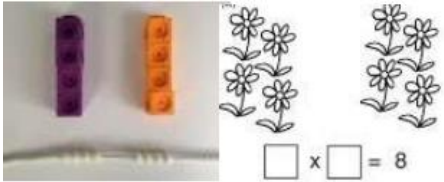
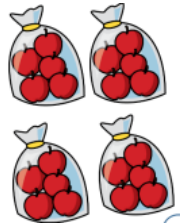
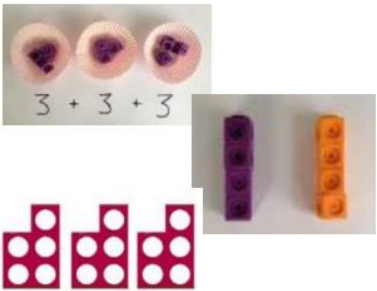
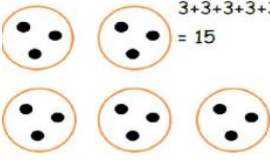


Multiplication - Year 1			
Vocabulary	Groups of, lots of, times, array, altogether, multiply		
Objective	Concrete	Pictorial	Abstract
Doubling	Use practical activities using manipulatives including cubes and Numicon to demonstrate doubling. 	Draw pictures to show how to double numbers. Double 4 is 8 	Partition a number and then double each part before recombining it back together. 
Counting in multiples (2s, 5s, 10s)	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 10, 20, 30, 40, 50



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Making equal groups and counting the total	Use manipulatives to create equal groups. 	Draw and make representations. Draw  to show $2 \times 3 = 6$ 	$2 \times 4 = 8$
Repeated addition	Use different objects to add equal groups 	Use pictorial including number lines to solve problems There are 3 sweets in one bag. How many sweets are in 5 bags altogether? $3+3+3+3+3 = 15$   There are 3 plates. Each plate has 2 star biscuits on. How many biscuits are there?  2 add 2 add 2 equals 6  $5 + 5 + 5 = 15$	Write addition sentences to describe objects and pictures  $2 + 2 + 2 + 2 + 2 = 10$

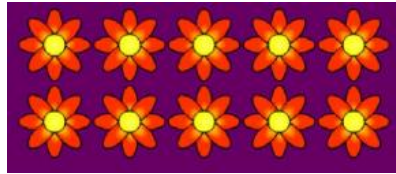


Our Vision: "To make every day count"

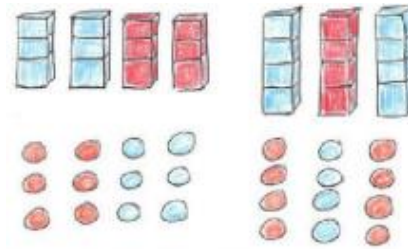
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Understanding arrays

Use objects laid out in arrays to find the answers to 2 lots of 5, 3 lots of 2 etc.



Draw representations of arrays to show understanding



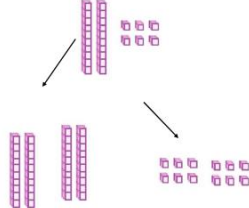
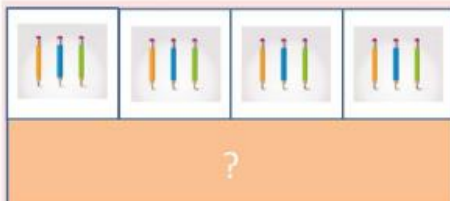
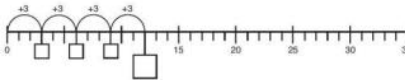
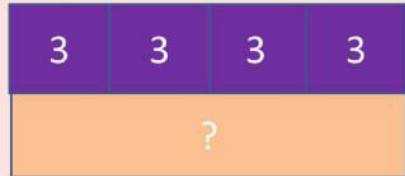
$$3 \times 2 = 6$$

$$2 \times 5 = 10$$



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Multiplication - Year 2			
Vocabulary	Groups of, lots of, times, array, altogether, multiply, multiplied by, repeated addition, sets of, equal groups, times as big as, commutative		
Objective	Concrete	Pictorial	Abstract
Doubling	Model doubling using Base 10 and Place Value 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.  $5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 = 40$ 	Number lines, counting sticks and bar models should be used to show representation of counting in multiples. Use bar models.    	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 $4 \times 3 = ?$

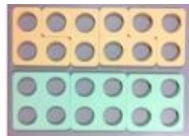


Our Vision: "To make every day count"

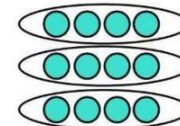
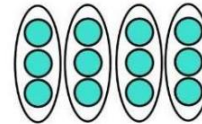
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Multiplication is commutative

Create arrays using counters, 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.



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



$$5 + 5 + 5 = 15$$

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

$$5 \times 3 = 15$$

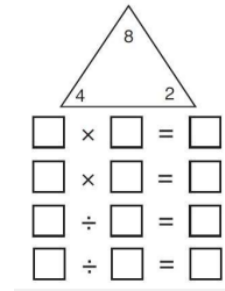
$$3 \times 5 = 15$$



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Using the inverse (to be taught alongside division so pupils learn how they work alongside each other)



$$2 \times 4 = 8$$

$$4 \times 2 = 8$$

$$8 \div 2 = 4$$

$$8 \div 4 = 2$$

$$8 = 2 \times 4$$

$$8 = 4 \times 2$$

$$2 = 8 \div 4$$

$$4 = 8 \div 2$$

Show all 8 related fact family sentences.



Multiplication - Year 3

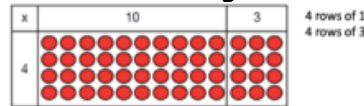
Vocabulary

Groups of, lots of, times, array, altogether, multiply, multiplied by, repeated addition, sets of, equal groups, times as big as, commutative, product, multiples of, scale up

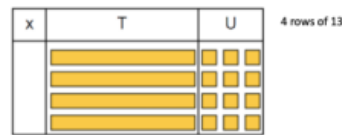
Multiplying 2-digit number by a 1-digit number

Grid method progressing to the formal method

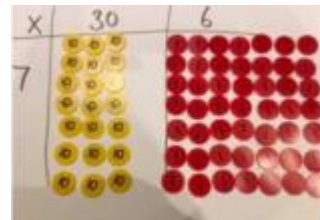
Show the link with arrays to first introduce the grid method.



Move on to using Base 10 to move towards a more compact method.



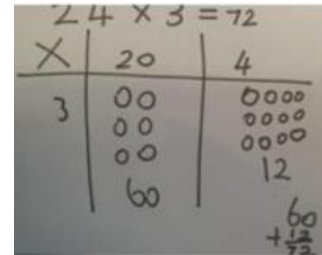
Move on to Place Value counters to show how we are finding groups of a number.



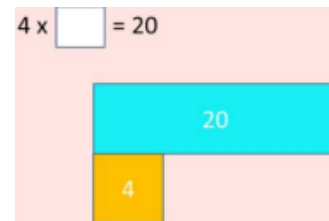
Add up each column, starting with the ones making any exchanges needed.

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.

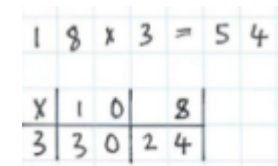


Use a bar model to explore missing numbers.



Start with multiplying by 1-digit numbers and showing the clear addition alongside the grid.

Tens and ones times ones
Add up the columns to find the answer.



Move forward to the formal written method

$$\begin{array}{r} 35 \\ \times 7 \\ \hline 245 \\ \hline 3 \end{array}$$



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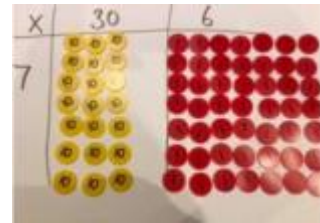
Multiplication - Year 4

Vocabulary

Groups of, lots of, times, array, altogether, multiply, multiplied by, repeated addition, sets of, equal groups, times as big as, commutative, product, multiples of, scale up, inverse, derive

Objective

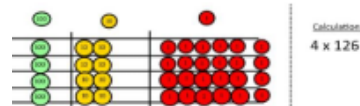
Multiply 2-digit and 3-digit numbers by a 1-digit number using formal written layout.
Grid method recap from Year 3 for 2-digit x 1-digit
Multiplying numbers by 1-digit



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

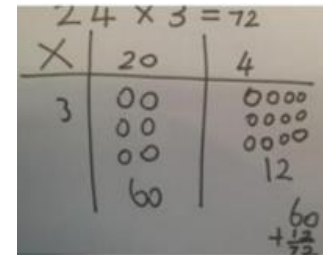


Add up each column, starting with the ones making any exchanges needed.

Pictorial

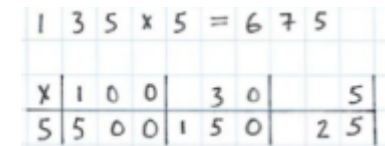
Children can represent their work with place value counters in a way that they understand.

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

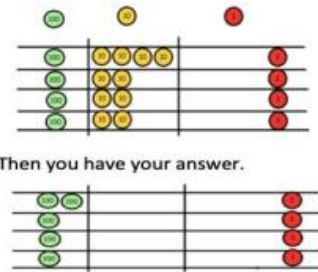


Abstract

HTO X O



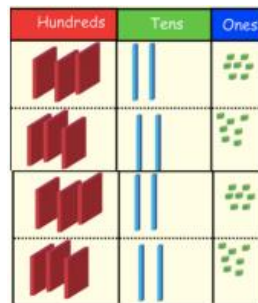
Children to add up each column to find the answer.



Column multiplication

Children can continue to be supported by Place Value counters at the stage of multiplication. This is initially done where there is no regrouping.

The corresponding long multiplication is modelled alongside.
 $321 \times 2 = 642$

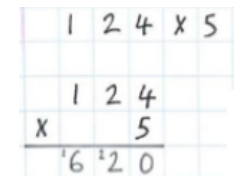
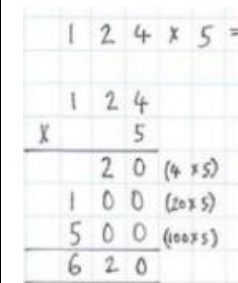
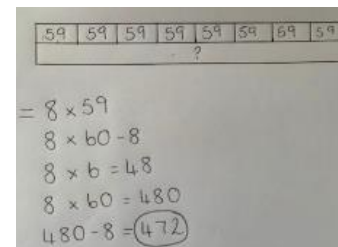


This grid method may be used to show how this relates to a formal

x	100	20	4
5	500	100	20

written method.

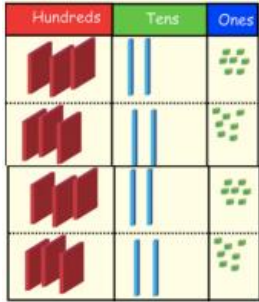
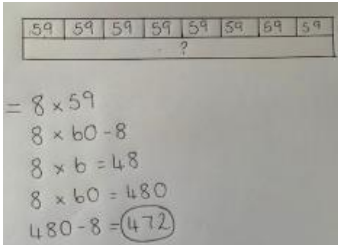
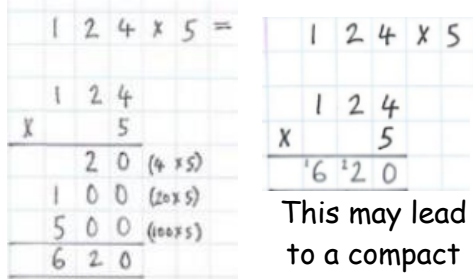
Bar modelling and number lines can support learners when solving problems with multiplication alongside the formal written methods.



This may lead to a compact method.



Multiplication - Year 5

Vocabulary	Groups of, lots of, times, array, altogether, multiply, multiplied by, repeated addition, sets of, equal groups, times as big as, commutative, product, multiples of, scale up, inverse, derive, factor pairs, composite numbers, prime number, factors, squared, cubed										
Objective	Concrete	Pictorial	Abstract								
Multiply numbers up to 4-digits by a 1-digit number using the formal written method, including long multiplication for 2-digit numbers. Column multiplication for 3 and 4-digits x 1-digit	Children can continue to be supported by Place Value counters at the stage of multiplication. This is initially done where there is no regrouping. The corresponding long multiplication is modelled alongside. $321 \times 2 = 642$ 	This grid method may be used to show how this relates to a formal written method. <table border="1" data-bbox="1167 555 1581 644"> <tr> <td>x</td><td>100</td><td>20</td><td>4</td></tr> <tr> <td>5</td><td>500</td><td>100</td><td>20</td></tr> </table> written method. Bar modelling and number lines can support learners when solving problems with multiplication alongside the formal written methods. 	x	100	20	4	5	500	100	20	 This may lead to a compact method.
x	100	20	4								
5	500	100	20								



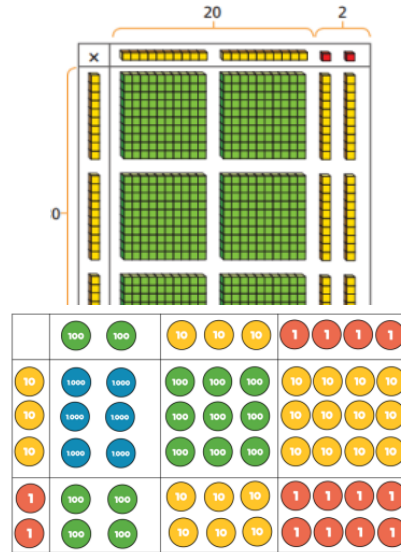
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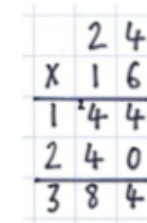
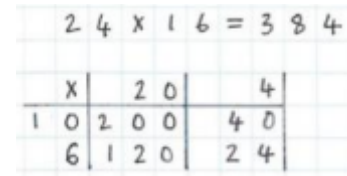
Multiply numbers up to 4-digits by a 1-digit number using the formal written method, including long multiplication for 2-digit numbers.

Column multiplication (long multiplication)

Manipulatives may still be used with the corresponding long multiplication modelled alongside.



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



24 x 6 on the first row.

(6 x 4 = 24, carrying the 2 for the 20, then 6 x 2)

24 x 10 on the second row. Show multiplying by 10 by putting zero in the units first.



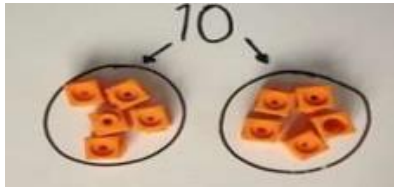
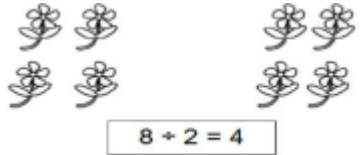
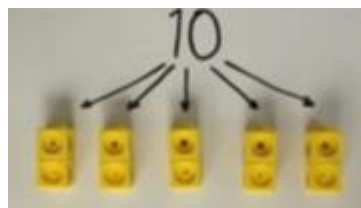
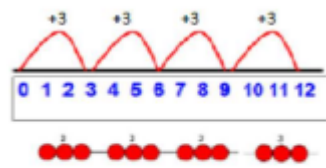
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Multiplication - Year 6

Vocabulary	Groups of, lots of, times, array, altogether, multiply, multiplied by, repeated addition, sets of, equal groups, times as big as, commutative, product, multiples of, scale up, inverse, derive, factor pairs, composite numbers, prime number, factors, squared, cubed		
Objective	Concrete	Pictorial	Abstract
Multiply decimals up to 2 decimal places by a single digit.			$\begin{array}{r} 3.72 \\ \times 8 \\ \hline 29.76 \end{array}$ Remind the children that the single digit belongs under the last digit of the decimal number.

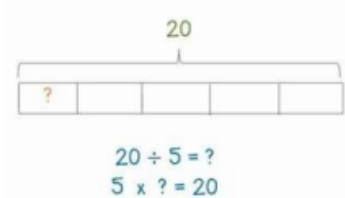


Division - Year 1			
Vocabulary	Share, share equally, one each, two each..., group, groups of, lots of, array		
Objective	Concrete	Pictorial	Abstract
Division as sharing (sharing objects into groups)	 I have 10 cubes, can you share them equally in 2 groups?	 Children can use pictures or shapes to share quantities.  Use bar modelling to support understanding.	$12 \div 3 = 4$ Share 9 buns between 3 people.
Division as grouping	 Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding.	Use number lines for grouping.  $12 \div 3 = 4$ 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 in each group.	$28 \div 7 = 4$ Divide 28 into 7 groups. How many are in each group?



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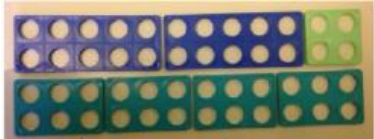
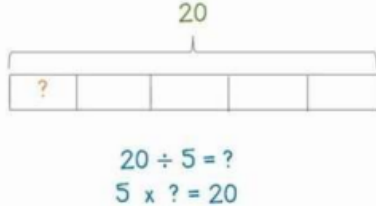
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		 $20 \div 5 = ?$ $5 \times ? = 20$	
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Division - Year 2			
Vocabulary	Share, share equally, one each, two each..., group, groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over		
Objective	Concrete	Pictorial	Abstract
Division as grouping	Use cubes, counters, objects or place value counters to aid understanding.   $96 \div 3 = 32$ 	Continue to use bar modelling to aid solving division problems.  Use a number line to show jumps in groups. The number of jumps equals the number of groups. 	How many groups of 6 are there in 24? $24 \div 6 = 4$
Division with arrays	Link division to multiplication by creating an array and thinking about the number sentences that can be created.	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 sentence. E.g. $2 \times 5 = 10$ $5 \times 2 = 10$ $10 = 5 \times 2$

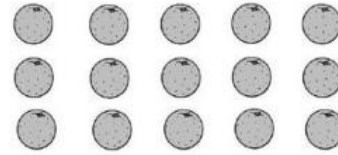


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E.g. $15 \div 3 = 5$
 $15 \div 5 = 3$
 $5 \times 3 = 15$
 $3 \times 5 = 15$

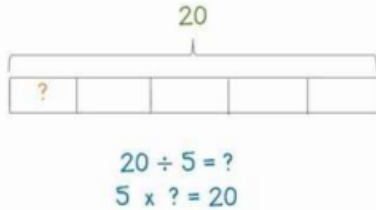
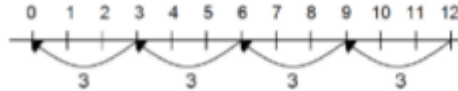
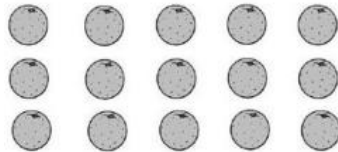


$10 = 2 \times 5$
 $10 \div 2 = 5$
 $10 \div 5 = 2$
 $5 = 10 \div 2$
 $2 = 10 \div 5$



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Division - Year 3			
Vocabulary	Share, share equally, one each, two each..., group, groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, product		
Objective	Concrete	Pictorial	Abstract
Division as grouping	Use cubes, counters, objects or place value counters to aid understanding.   $96 \div 3 = 32$ 	Continue to use bar modelling to aid solving division problems.  Use a number line to show jumps in groups. The number of jumps equals the number of groups. 	How many groups of 6 are there in 24? $24 \div 6 = 4$
Division with arrays	Link division to multiplication by creating an array and thinking about the number sentences that can be created.	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 sentence. E.g. $2 \times 5 = 10$ $5 \times 2 = 10$ $10 = 5 \times 2$ $10 = 2 \times 5$



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$$\begin{aligned} \text{E.g. } 15 \div 3 &= 5 \\ 15 \div 5 &= 3 \\ 5 \times 3 &= 15 \\ 3 \times 5 &= 15 \end{aligned}$$

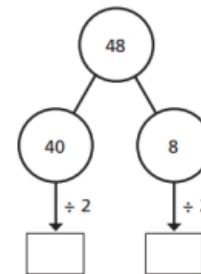
$$\begin{aligned} 10 \div 2 &= 5 \\ 10 \div 5 &= 2 \\ 5 &= 10 \div 2 \\ 2 &= 10 \div 5 \end{aligned}$$

Divide 2-digit numbers by a 1-digit number by partitioning into tens and ones

When dividing larger numbers, use manipulatives that allow to partition into tens and ones.

Tens	Ones
	
	

Part-whole models provide children with a clear written method that matches the concrete representation.

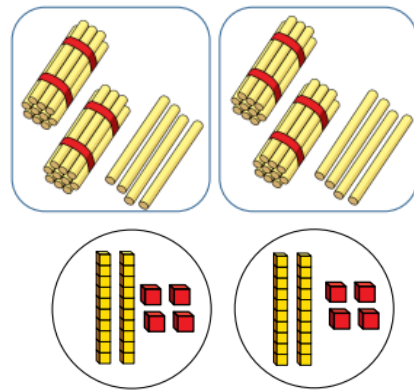


$$48 \div 2 = 24$$



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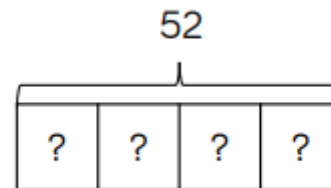


Straws, Base 10 and Place Value counters can all be used to share numbers into equal groups.

Divide numbers that involve exchanging between the tens and ones. Answers do not have a remainder.

When dividing numbers involving an exchange, use Base 10 and Place Value counters to exchange 1 ten for 10 ones. Start with the equipment outside the Place Value grid before sharing the tens and ones equally between the rows.

Flexible partitioning on a part-whole model supports this method.

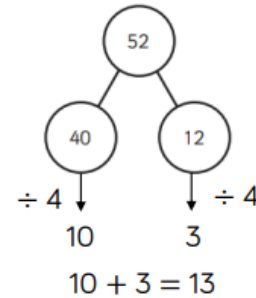
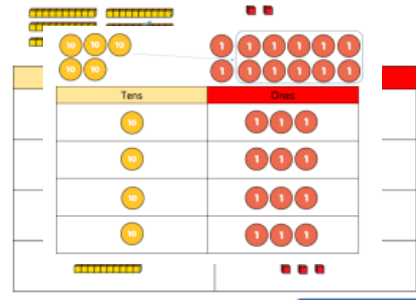


$$52 \div 4 = 13$$



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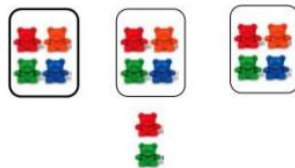
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Division with remainders

Divide objects into groups and see how much is left over.

$$14 \div 3 =$$



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.



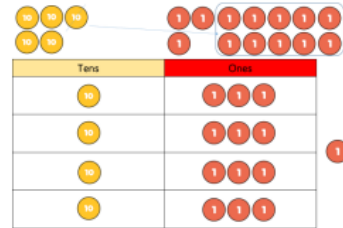
Complete written divisions and show the remainder using r.

$$\begin{array}{ccccccc}
 29 \div 8 = 3 \text{ REMAINDER } 5 \\
 \uparrow \quad \uparrow \quad \uparrow \quad \uparrow \\
 \text{dividend} \quad \text{divisor} \quad \text{quotient} \quad \text{remainder}
 \end{array}$$

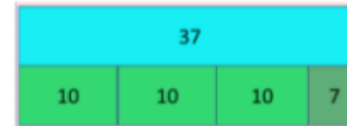


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Use bar models to show division with remainders.





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Division - Year 4

Vocabulary

Share, share equally, one each, two each..., group, groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, product, division facts, inverse, derive

Objective

Divide up to 3-digit numbers by 1-digit.
Short division.

Concrete

96 ÷ 3

Tens Units

3 2

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

42 ÷ 3 =

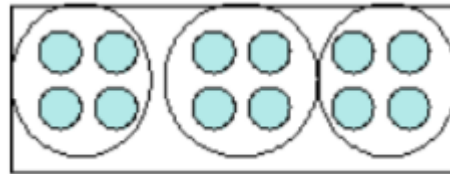
Start with the biggest place value, we are sharing 40 into three groups. We can put 1 ten in each group and we have 1 ten left over.

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

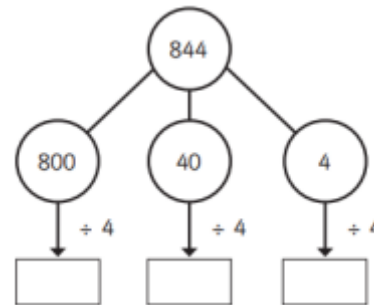
We look how much in 1 group so the answer is 14.

Pictorial

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



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



Abstract

Begin with divisions that divide equally with no remainder.

$$\begin{array}{r} 19 \\ 4 \overline{)76} \end{array} \quad \begin{array}{r} 247 \\ 3 \overline{)741} \end{array}$$

Children should be aware that a 0 is used to keep place value, if the number is not divisible.

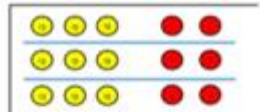
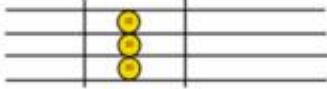
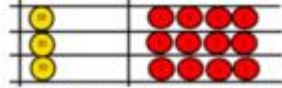
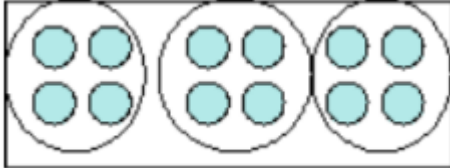
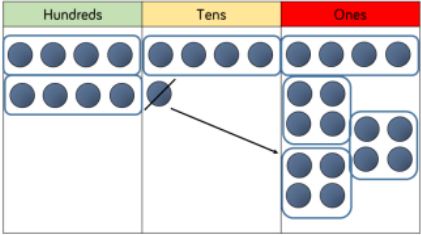
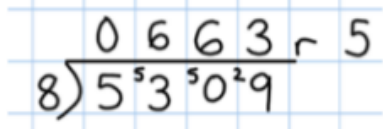
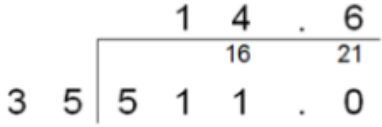
$$\begin{array}{r} 093 \\ 8 \overline{)744} \end{array}$$

Move onto divisions with a remainder.

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

Division - Year 5



Vocabulary	Share, share equally, one each, two each..., group, groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, product, division facts, inverse, derive, formal written method, decimal		
Objective	Concrete	Pictorial	Abstract
Divide at least 4-digit numbers by 1-digit. Interpret remainders appropriately for the context. Short division.	$96 \div 3$ Tens Units 3 2  Use place value counters to divide using the bus stop method alongside  $42 \div 3 =$ 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.	Children can continue to use drawn diagrams with dots or circles to help them divide numbers into equal groups.  Encourage children to move towards counting in multiples to divide more efficiently. 	 Finally, move into decimal places to divide the total accurately. 



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Division - Year 6

Division - Year 6																																																																		
Vocabulary	Share, share equally, one each, two each..., group, groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, product, division facts, inverse, derive																																																																	
Objective	Concrete	Pictorial	Abstract																																																															
Divide multi-digits by 2-digits Short division	When children begin to divide up to 4-digits by 2-digits, written methods become the most accurate as concrete and pictorial become less effective.	Children can write out multiples to support their calculations with larger remainders. <table><tr><td>15</td><td>30</td><td>45</td><td>60</td><td>75</td><td>90</td><td>105</td><td>120</td><td>135</td><td>150</td></tr></table>	15	30	45	60	75	90	105	120	135	150	<table><tr><td></td><td>0</td><td>4</td><td>8</td><td>9</td></tr><tr><td>15</td><td>7</td><td>7</td><td>3</td><td>13</td><td>13</td><td>5</td></tr></table>		0	4	8	9	15	7	7	3	13	13	5																																									
15	30	45	60	75	90	105	120	135	150																																																									
	0	4	8	9																																																														
15	7	7	3	13	13	5																																																												
Divide multi-digits by 2-digits Long division	When children begin to divide up to 4-digits by 2-digits, written methods become the most accurate as concrete and pictorial become less effective.	Children can write out multiples to support their calculations with larger remainders. <table><tr><td>1 × 15 = 15</td><td>12 × 1 = 12</td></tr><tr><td>2 × 15 = 30</td><td>12 × 2 = 24</td></tr><tr><td>3 × 15 = 45</td><td>12 × 3 = 36</td></tr><tr><td>4 × 15 = 60</td><td>12 × 4 = 48</td></tr><tr><td>5 × 15 = 75</td><td>12 × 5 = 60</td></tr><tr><td>6 × 15 = 90</td><td>12 × 6 = 72</td></tr><tr><td>7 × 15 = 105</td><td>12 × 7 = 84</td></tr><tr><td>8 × 15 = 120</td><td>12 × 8 = 96</td></tr><tr><td>9 × 15 = 135</td><td>12 × 9 = 108</td></tr><tr><td>10 × 15 = 150</td><td>12 × 10 = 120</td></tr></table>	1 × 15 = 15	12 × 1 = 12	2 × 15 = 30	12 × 2 = 24	3 × 15 = 45	12 × 3 = 36	4 × 15 = 60	12 × 4 = 48	5 × 15 = 75	12 × 5 = 60	6 × 15 = 90	12 × 6 = 72	7 × 15 = 105	12 × 7 = 84	8 × 15 = 120	12 × 8 = 96	9 × 15 = 135	12 × 9 = 108	10 × 15 = 150	12 × 10 = 120	<table><tr><td></td><td>0</td><td>4</td><td>8</td><td>9</td></tr><tr><td>15</td><td>7</td><td>3</td><td>3</td><td>5</td></tr><tr><td>—</td><td>6</td><td>0</td><td>0</td><td>0</td><td>(×400)</td></tr><tr><td></td><td>1</td><td>3</td><td>3</td><td>5</td></tr><tr><td>—</td><td>1</td><td>2</td><td>0</td><td>0</td><td>(×80)</td></tr><tr><td></td><td></td><td>1</td><td>3</td><td>5</td></tr><tr><td>—</td><td></td><td>1</td><td>3</td><td>5</td><td>(×9)</td></tr><tr><td></td><td></td><td></td><td></td><td>0</td></tr></table> When a remainder is left at the end, children can either leave it as a remainder or convert it to a fraction. This will depend on the context of the question.		0	4	8	9	15	7	3	3	5	—	6	0	0	0	(×400)		1	3	3	5	—	1	2	0	0	(×80)			1	3	5	—		1	3	5	(×9)					0
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			2	4	r	1	2
1	5	3	7	2			
-		3	0	0			
			7	2			
-			6	0			
			1	2			

			2	4	$\frac{4}{5}$
1	5	3	7	2	
-		3	0	0	
			7	2	
-			6	0	
			1	2	