

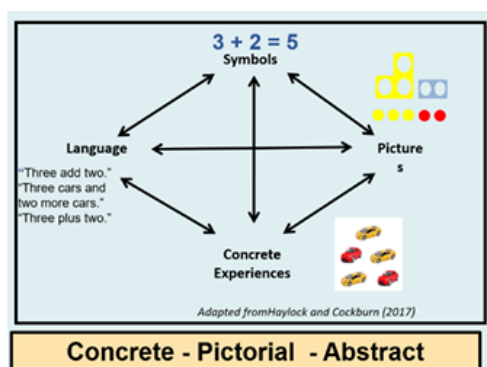


Buxworth Primary School

Calculation Policy

At Buxworth Primary School we follow the National Curriculum for Maths using the Oak National Academy to support our teaching. Oak National Academy is an innovative teaching framework that supports schools, students and teachers to become successful mathematicians. It focuses on significant areas such as problem solving, reasoning and fluency and is fundamental to the teaching and learning of mathematics. With 'Project 25' being one of the main driving forces of our curriculum, our mathematics lessons help to provide the children with the skills they need for life.

Our calculation policy focuses on the links between, and the progression through, concrete, pictorial and abstract methods in mathematics.



Pupils need to be taught and encouraged to decide what approach they will take to a calculation, to ensure that they select the most appropriate method for the numbers involved. They are first taught to use concrete representations, then move on to pictorial and finally to use abstract. Moving through all these stages enables a child to choose the best strategy and method that works for them.

They can then consider:

- Can I do it in my head using a mental strategy?
- Could I use some jottings or a picture to help me?
- Should I use a written method to work it out?

When working out challenging calculations, we teach children to:

- Approximate
- Calculate
- Check

Teaching children calculations in this manner brings success.

This policy was written: June 2024

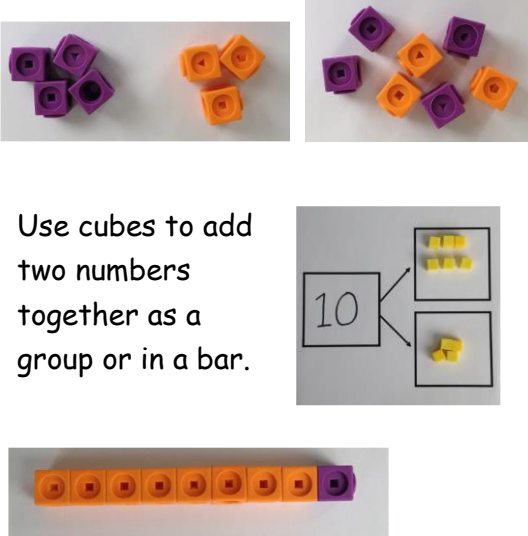
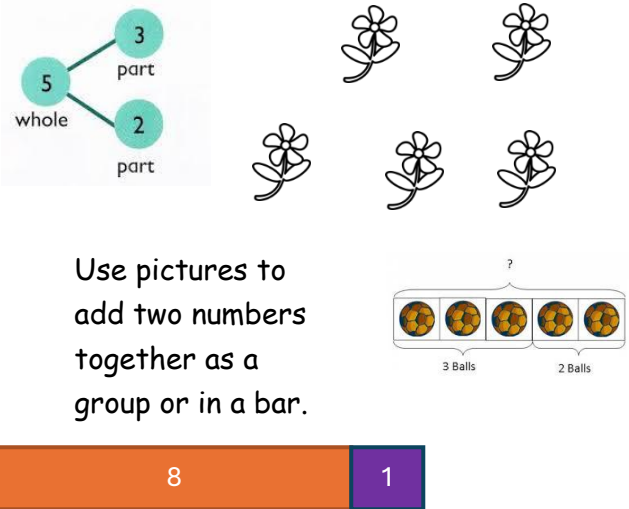
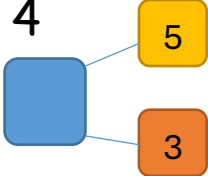

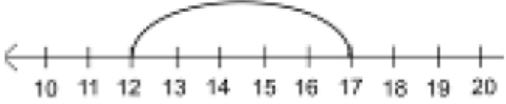
Reviewed: July 2025

This policy will be reviewed: Yearly

Subject Lead: Carla Downings

Progression in Calculations

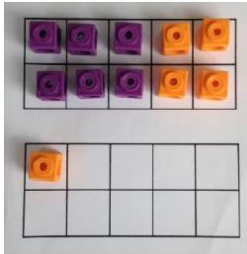
Addition

Objective and Strategies	Concrete	Pictorial	Abstract
<p>Combining two parts to make a whole: part-whole model</p>	 <p>Use cubes to add two numbers together as a group or in a bar.</p>	 <p>Use pictures to add two numbers together as a group or in a bar.</p>	<p>$4 + 3 = 7$</p> <p>$10 = 6 + 4$</p>  <p>Use the part-part whole diagram as shown above to move into the abstract.</p>
<p>Starting at the bigger number and counting on</p>	 <p>Start with the larger number on the bead string and then count on to the smaller number 1 by 1 to find the answer.</p>	<p>$12 + 5 = 17$</p>  <p>Start at the larger number on the number line and count on in ones or in one jump to find the answer.</p>	<p>$5 + 12 = 17$</p> <p>Place the larger number in your head and count on the smaller number to find your answer.</p>

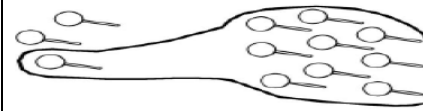
Regrouping to make 10.



$$6 + 5 = 11$$



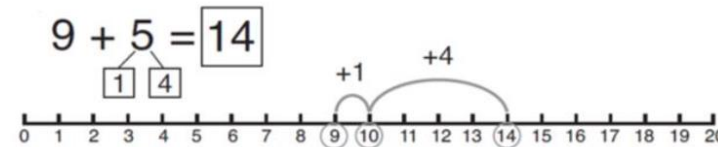
Start with the bigger number and use the smaller number to make 10.



$$3 + 9 =$$

make 10.

Use pictures or a number line. Regroup or partition the smaller number to



$$7 + 4 = 11$$

If I am at seven, how many more do I need to make 10. How many more do I add on now?

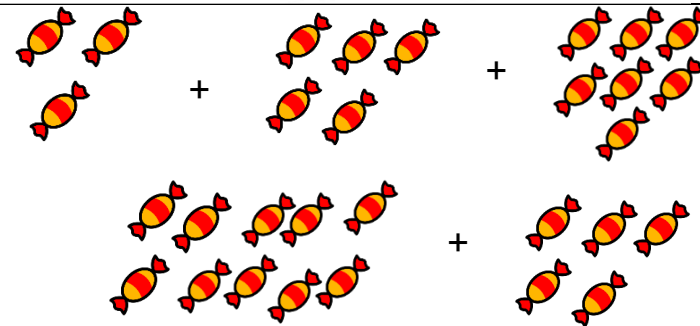
Adding three single digits

$$4 + 7 + 6 = 17$$

Put 4 and 6 together to make 10. Add on 7.



Following on from making 10, make 10 with 2 of the digits (if possible) then add on the third digit.



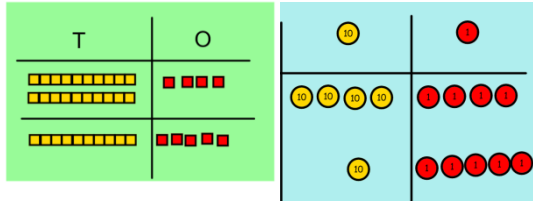
Add together three groups of objects. Draw a picture to recombine the groups to make 10.

$$\begin{aligned} (4) + 7 + (6) &= (10) + (7) \\ 10 &= (17) \end{aligned}$$

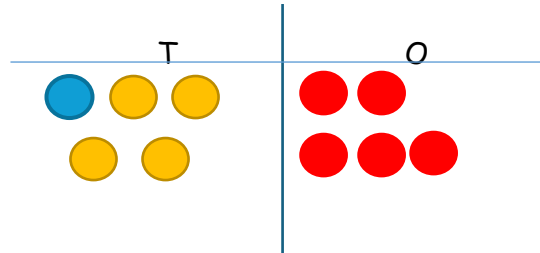
Combine the two numbers that make 10 and then add on the remainder.

Column method- 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.



After practically using the base 10 blocks and place value counters, children can draw the counters to help them to solve additions.



Calculations

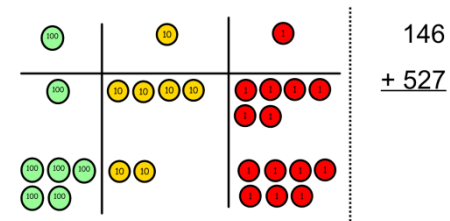
$$21 + 42 =$$

21

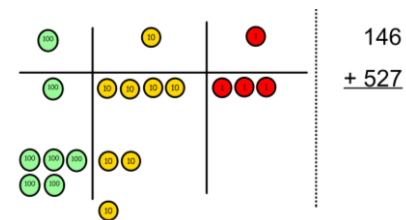
+ 42

Column method- regrouping

Make both numbers on a place value grid.

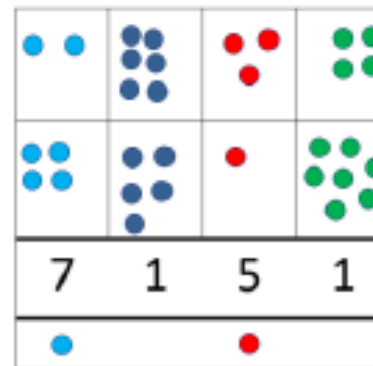


Add up the units and exchange 10 ones for one 10.



Add up the rest of the columns, exchanging the 10 counters from one column for the next place value

Children can draw a pictorial representation of the columns and place value counters to further support their learning and understanding.



Start by partitioning the numbers before moving on to clearly show the exchange below the addition.

$$20 + 5$$

$$40 + 8$$

$$60 + 13 = 73$$

$$\begin{array}{r} 536 \\ + 85 \\ \hline 621 \\ 11 \end{array}$$

column until every column has been added.

This can also be done with Base 10 to help children clearly see that 10 ones equal 1 ten and 10 tens equal 100.

As children move on to decimals, money and decimal place value counters can be used to support learning.

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

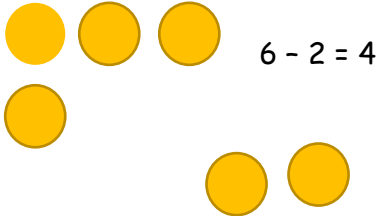
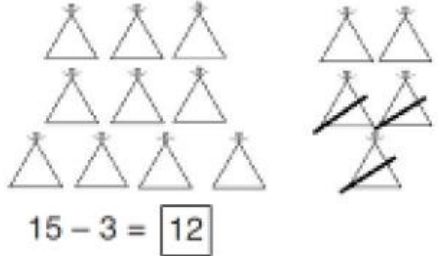

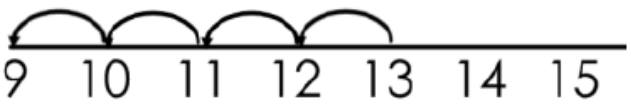
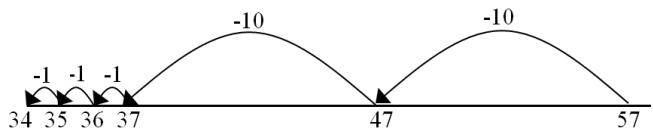
$$\begin{array}{r} 72.8 \\ + 54.6 \\ \hline 127.4 \end{array}$$
$$\begin{array}{r} \text{£ } 23.59 \\ + \text{£ } 7.55 \\ \hline \text{£ } 31.14 \\ \small 1 \quad 1 \quad 1 \end{array}$$

$$\begin{array}{r} 23.361 \\ 9.080 \\ + 1.300 \\ \hline 93.511 \\ \small 2 \quad 1 \quad 2 \end{array}$$

Language used for addition:

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
add, more, and, make, sum, total, whole, altogether double, one more, two more, ... ten more, how many more to make ...? how many more is ... than ...? how much more is ...?	addition, add, addend, more, and make, sum, total, whole, altogether, double, near double, one more, two more ... ten more, how many more to make ...? how many more is ... than ...? how much more is ...?	addition, add, addend, more, and make, sum, total, whole, altogether, double, near double, one more, two more ... ten more ... one hundred more, how many more to make ...? how many more is ... than ...? how much more is ...? is the same as, number bonds/pairs/facts, tens boundary	addition, add, addend, more, and make, sum, total, whole, altogether, double, near double, one more, two more ... ten more ... one hundred more, how many more to make ...? how many more is ... than ...? how much more is ...? number bonds/pairs/facts, missing number tens boundary, hundreds boundary, equals is the same as	addition, add, addend, more, and make, sum, total, whole, altogether, double, near double, one more, two more... ten more... one hundred more, how many more to make ...? how many more is ... than ...? how much more is ...? bonds/pairs/facts, missing number tens boundary, hundreds boundary, inverse, equals is the same as	addition, add, addend, more, and make, sum, total, whole, altogether, double, near double, one more, two more ... ten more ... one hundred more, how many more to make ...? how many more is ... than ...? how much more is ...? equals is the same as number bonds/pairs/facts, missing number tens boundary, hundreds boundary, ones boundary, tenths boundary inverse	addition, add, addend, more, and make, sum, total, whole, altogether, double, near double, one more, two more ... ten more ... one hundred more, how many more to make ...? how many more is ... than ...? how much more is ...? equals is the same as, number bonds/pairs/facts, missing number, tens boundary, hundreds boundary, ones boundary, tenths boundary, inverse

Subtraction

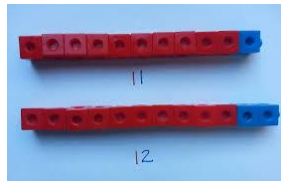
Objective and Strategies	Concrete	Pictorial	Abstract
<p>Taking away ones</p>	<p>Use physical objects, counters, cubes etc to show how objects can be taken away.</p>  <p style="text-align: center;">$6 - 2 = 4$</p>	<p>Cross out drawn objects to show what has been taken away.</p>  <p style="text-align: center;">$15 - 3 = 12$</p>	<p>$18 - 3 = 15$</p> <p>$8 - 2 = 6$</p>
<p>Counting back</p>	<p>Make the larger number in your subtraction. Move the beads along your bead string as you count backwards in ones.</p>  <p>$13 - 4$</p> <p>Use counters and move them away from the group as you take them away counting backwards as you go.</p>	<p>Count back on a number line or number track</p>  <p style="text-align: center;">$9 \quad 10 \quad 11 \quad 12 \quad 13 \quad 14 \quad 15$</p> <p>Start at the bigger number and count back the smaller number showing the jumps on the number line.</p>  <p style="text-align: center;">$34 \quad 35 \quad 36 \quad 37 \quad 47 \quad 57$</p>	<p>Put 13 in your head, count back 4. What number are you at? Use your fingers to help.</p>



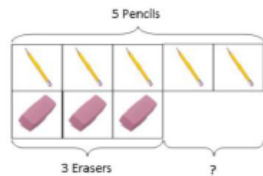
This can progress all the way to counting back using two 2 digit numbers.

Find the difference

Compare amounts and objects to find the difference.

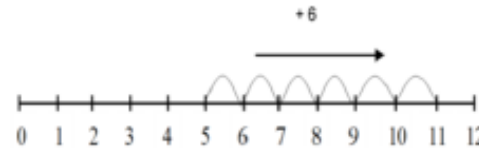


Use cubes to build towers or make bars to find the difference



Use basic bar models with items to find

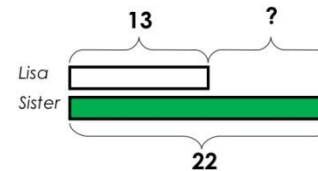
the difference



Count on to find the difference.

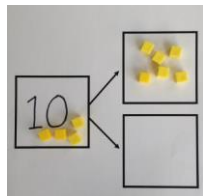
Comparison Bar Models

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



Draw bars to find the difference between 2 numbers.

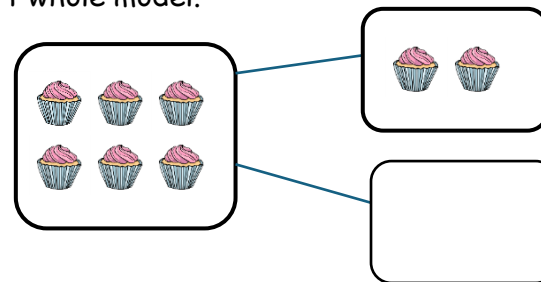
Part Part Whole Model



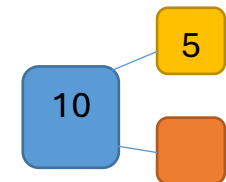
Link to addition- use the part whole model to help explain the inverse between addition and subtraction.

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

Use a pictorial representation of objects to show the part part whole model.



Hannah has 23 sandwiches, Helen has 15 sandwiches. Find the difference between the number of sandwiches.



$$10 - 6 =$$

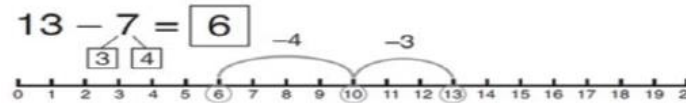
Move to using numbers within the part whole model.

Make 10

$$14 - 9 =$$



Make 14 on the ten frame. Take away the four first to make 10 and then take away one more so you have taken away 5. You are left with the answer of 9.



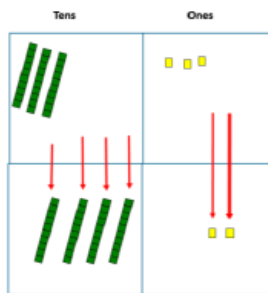
Start at 13. Take away 3 to reach 10. Then take away the remaining 4 so you have taken away 7 altogether. You have reached your answer.

$$16 - 8 =$$

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

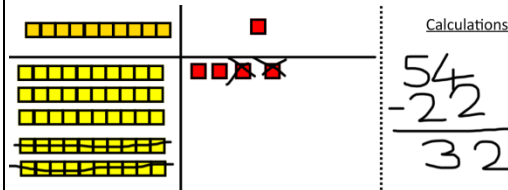
How many do we have left to take off?

Column method without regrouping

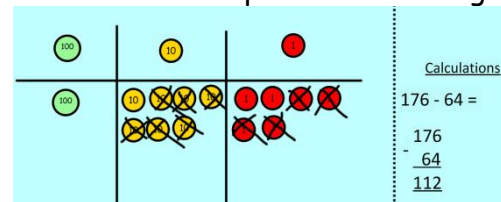


Use Base 10 to make the bigger number then take the smaller number away.

Show how you partition numbers to subtract. Again make the larger number first.



calculation to help to show working.



Draw the Base 10 or place value counters alongside the written

$$47 - 24 = 23$$

$$\begin{array}{r} 40 + 7 \\ - 20 + 4 \\ \hline 20 + 3 \end{array}$$

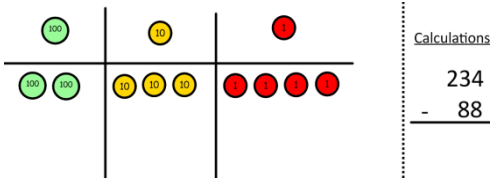
This will lead to a clear

written column subtraction.

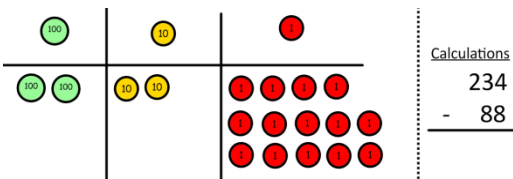
Column method with regrouping

Use Base 10 to start with before moving on to place value counters. Start with one exchange before moving onto subtractions with 2 exchanges.

Make the larger number with the place value counters

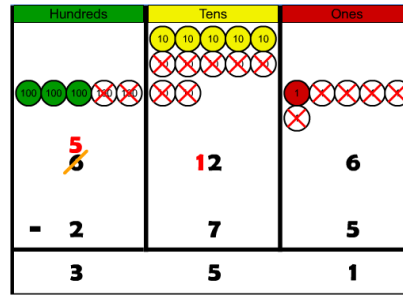


Start with the ones, can I take away 8 from 4 easily? I need to exchange one of my tens for ten ones.

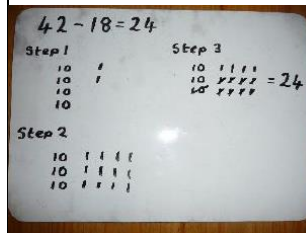


Now I can subtract my ones.

Now look at the tens, can I take away 8 tens easily? I need to exchange one hundred for ten tens.

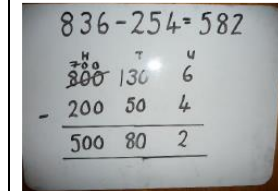


Draw the counters onto a place value grid and show what you have taken away by crossing the counters out as well as clearly showing the exchanges you make.

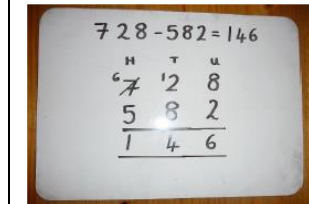


When confident, children can find their own way to record the exchange/regrouping.

Just writing the numbers as shown here shows that the child understands the method and knows when to exchange/regroup.

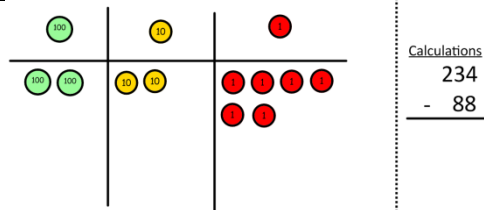


Children can start their formal written method by partitioning the number into clear place value columns.



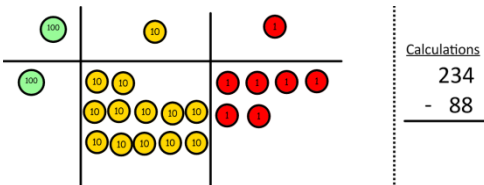
Moving forward the children use a more compact method.

This will lead to an understanding of



Calculations

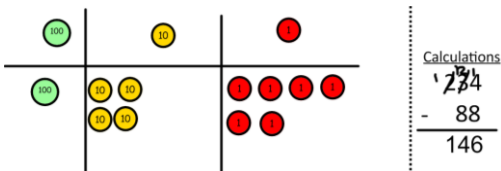
$$\begin{array}{r} 234 \\ - 88 \\ \hline \end{array}$$



Calculations

$$\begin{array}{r} 234 \\ - 88 \\ \hline \end{array}$$

Now I can take away eight tens and complete my subtraction



Calculations

$$\begin{array}{r} 234 \\ - 88 \\ \hline 146 \end{array}$$

Show children how the concrete method links to the written method alongside your working. Cross out the numbers when exchanging and show where we write our new amount.

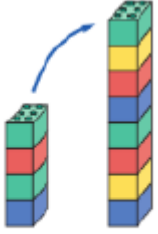

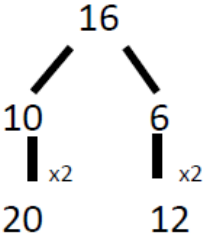
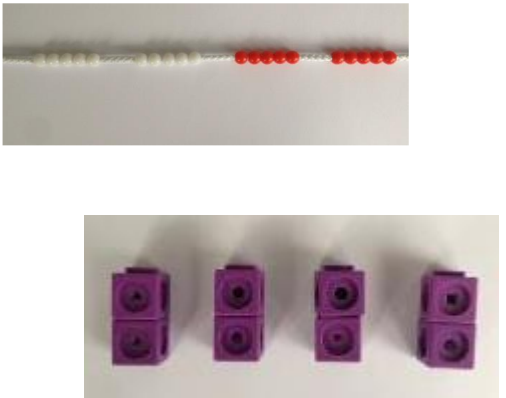
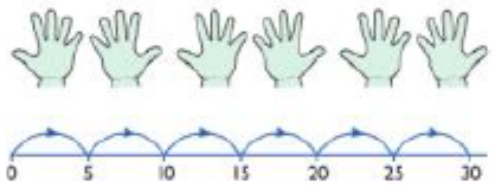
subtracting any number including decimals.

$$\begin{array}{r} 5 \quad 12 \quad 1 \\ 2 \quad \cancel{6} \quad \cancel{3} \quad . \quad 0 \\ - \quad 2 \quad 6 \quad . \quad 5 \\ \hline 2 \quad 3 \quad 6 \quad . \quad 5 \end{array}$$

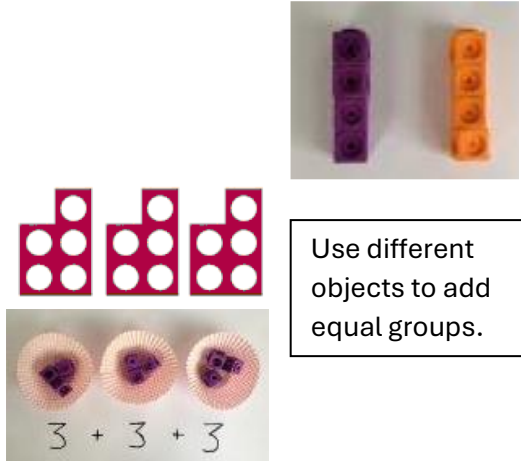
Language used for subtraction:

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>take away how many are left/left over? how many have gone? one less, two less, ten less ... how many fewer is ... than ...? how much less is ...? difference between</p>	<p>subtract, take away, how many are left/left over? how many have gone? one less, two less, ten less ... how many fewer is ... than ...? how much less is ...? difference between, equals is the same as, number bonds/pairs, missing number</p>	<p>subtract, subtrahend, minuend, difference, take away, how many are left/left over? how many have gone? one less, two less, ten less ... one hundred less, how many fewer is ... than ...? how much less is ...? difference between, equals, half, halve</p>	<p>subtract, subtrahend, minuend, difference, take away, how many are left/left over? how many have gone? one less, two less, ten less ... one hundred less, how many fewer is ... than ...? how much less is ...? difference between, equals is the same as, number bonds/pairs/facts missing number, tens boundary, hundreds boundary, half, halve</p>	<p>subtract, subtrahend, minuend, difference, take away, how many are left/left over? how many have gone? one less, two less, ten less ... one hundred less, how many fewer is ... than ...? how much less is ...? difference between, equals is the same as, number bonds/pairs/facts, missing number, tens boundary, hundreds boundary, inverse, half, halve</p>	<p>subtract, subtrahend, minuend, difference, take away, how many are left/left over? how many have gone? one less, two less, ten less ... one hundred less, how many fewer is ... than ...? how much less is ...? difference between, equals is the same as, number bonds/pairs/facts, missing number, tens boundary, hundreds boundary, ones boundary, tenths boundary, inverse, half, halve</p>	<p>subtract, subtrahend, minuend, difference, take away how many are left/left over? how many have gone? one less, two less, ten less ... one hundred less how many fewer is ... than ...? how much less is ...? difference between, equals is the same as, number bonds/pairs/facts, missing number, tens boundary, hundreds boundary, ones boundary, tenths boundary, inverse, half, halve</p>

Multiplication

Objective and Strategies	Concrete	Pictorial	Abstract
<p>Doubling</p>	<p>Use practical activities to show how to double a number.</p>  <p>double 4 is 8 $4 \times 2 = 8$</p>	<p>Draw pictures to show how to double a number.</p> <p style="text-align: center;">Double 4 is 8</p> 	 <p>Partition a number and then double each part before recombining it back together.</p>
<p>Counting in multiples</p>	 <p>Count in multiples supported by concrete objects in equal groups.</p>	 <p>Use a number line or pictures to continue support in counting in multiples.</p>	<p>Count in multiples of a number aloud.</p> <p>Write sequences with multiples of numbers.</p> <p>2, 4, 6, 8, 10</p> <p>5, 10, 15, 20, 25, 30</p>


Repeated addition



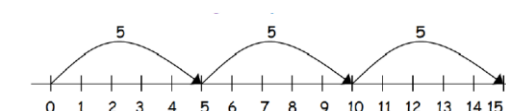
Use different objects to add equal groups.

$$3 + 3 + 3$$

There are 3 plates. Each plate has 2 star biscuits on. How many biscuits are there?



2 add 2 add 2 equals 6



$$5 + 5 + 5 = 15$$


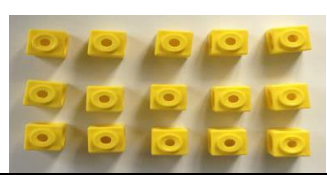
Write addition sentences to describe objects and pictures.



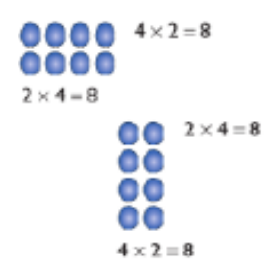
$$2 + 2 + 2 + 2 + 2 = 10$$

Arrays- showing commutative multiplication

Create arrays using counters/ cubes to show multiplication sentences.

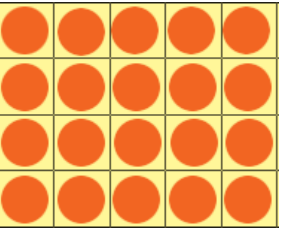
Draw arrays in different rotations to find **commutative** multiplication sentences.



$$4 \times 2 = 8$$


$$2 \times 4 = 8$$

$$2 \times 4 = 8$$

$$4 \times 2 = 8$$


Link arrays to area of rectangles.

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



$$5 + 5 + 5 = 15$$

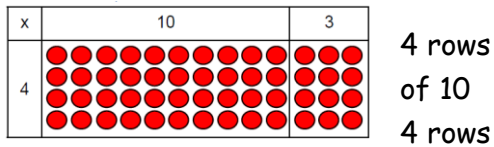
$$3 + 3 + 3 + 3 + 3 = 15$$

$$5 \times 3 = 15$$

$$3 \times 5 = 15$$

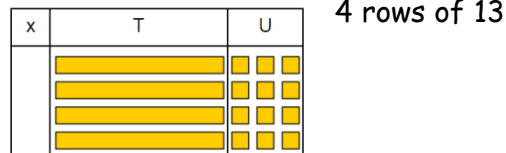
Grid Method

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

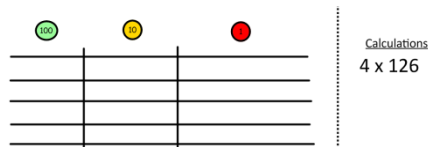


of 3

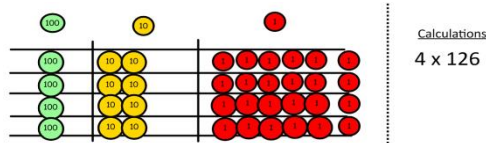
Move on to using Base 10 to move towards a more compact method.



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



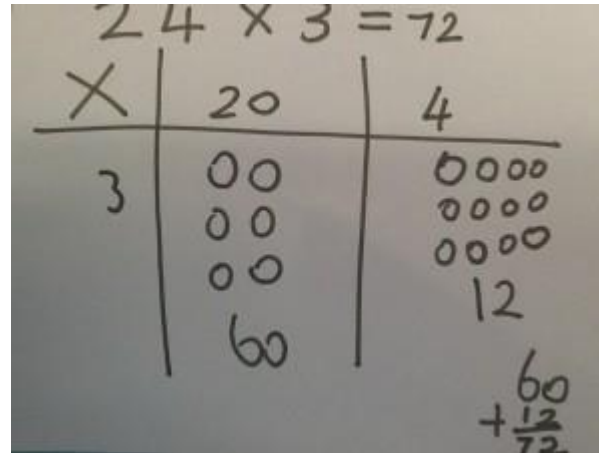
Fill each row with 126.



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

Children can represent the work they have done with place value counters in a way that they understand.

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



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

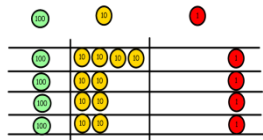
x	30	5
7	210	35

$$210 + 35 = 245$$

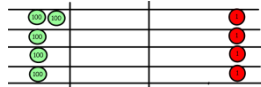
Moving forward, multiply by a 2 digit number showing the different rows within the grid method.

	10	8
10	100	80
3	30	24

x	1000	300	40	2
10	10000	3000	400	20
8	8000	2400	320	16

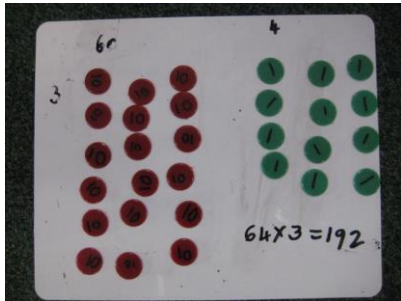


Then you have your answer.



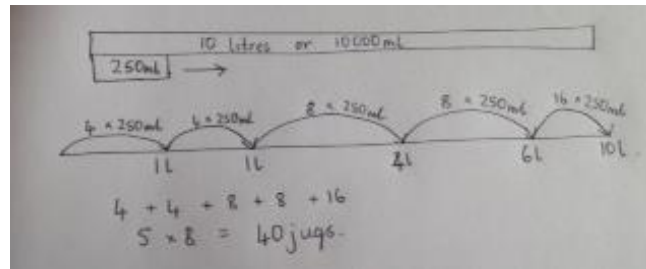
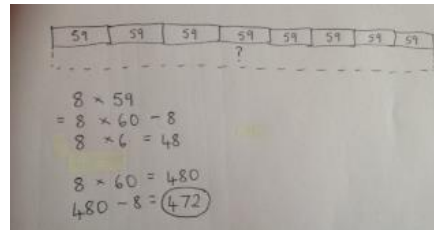
Column multiplication

Children can continue to be supported by place value counters at the stage of multiplication.



It is important at this stage that they always multiply the ones first and note down their answer followed by the tens which they note below.

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



Start with long multiplication, reminding the children about lining up their numbers clearly in columns.

If it helps, children can write out what they are solving next to their answer.

$$\begin{array}{r}
 32 \\
 \times 24 \\
 \hline
 8 \quad (4 \times 2) \\
 120 \quad (4 \times 30) \\
 \hline
 40 \quad (20 \times 2) \\
 600 \quad (20 \times 30) \\
 \hline
 768 \quad \begin{array}{l} 2 \quad 4 \quad 0 \\ 2 \quad 4 \quad 0 \end{array} \\
 + \quad \begin{array}{l} 4 \quad 2 \quad 0 \quad 0 \\ 4 \quad 6 \quad 6 \quad 2 \end{array}
 \end{array}$$

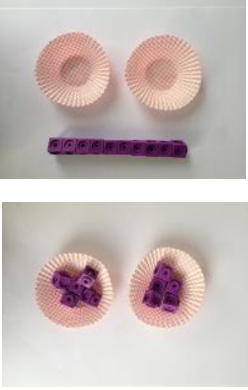
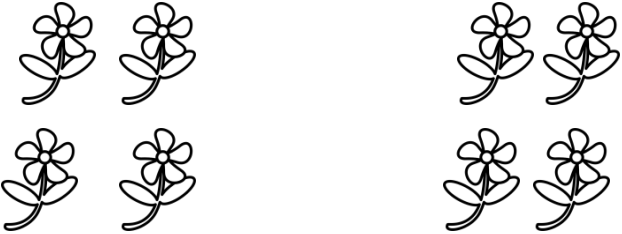
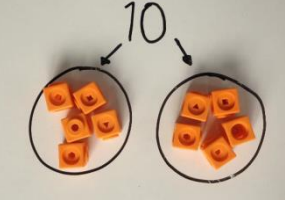


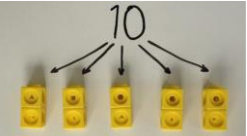
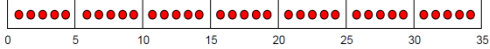
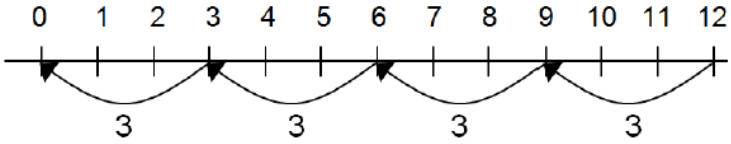
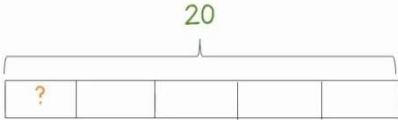
This moves to the more compact method.

$$\begin{array}{r}
 \quad \quad \quad 2 \quad 3 \quad 1 \\
 1342 \\
 \times \quad 18 \\
 \hline
 13420 \\
 10736 \\
 \hline
 24156 \\
 \hline
 \quad \quad \quad 1
 \end{array}$$

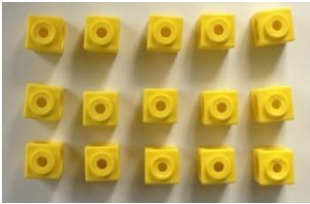
Language used for multiplication:

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
doubling, number patterns	multiplication, multiply, multiplied by, multiple, doubling, array, number patterns	Multiplication, multiply, multiplied by, multiple, groups of, times once, twice, three times ... ten times, repeated addition, doubling, array row, column, number patterns, multiplication table, multiplication fact	multiplication, multiply, multiplied by, multiple, factor, groups of, times product, once, twice, three times... ten times, repeated addition, doubling, array row, column, number patterns, multiplication table, multiplication fact	multiplication, multiply, multiplied by, multiple, factor, groups of, times, product, once, twice, three times ... ten times, repeated addition, doubling, array, row, column, number patterns, multiplication table, multiplication fact, inverse, square, squared cube, cubed	multiplication, multiply, multiplied by, multiple, factor, groups of, times, product, once, twice, three times ... ten times, repeated addition, doubling, array row, column, number patterns, multiplication table, multiplication fact, inverse, square, squared cube, cubed	multiplication, multiply, multiplied by, multiple, factor, groups of, times, product, once, twice, three times ... ten times, repeated addition, doubling, array row, column, number patterns, multiplication table, multiplication fact, inverse, square, squared cube, cubed

Division

Objective and Strategies	Concrete	Pictorial	Abstract
<p>Sharing objects into groups</p>	 <p>I have 10 cubes, can you share them equally in 2 groups?</p>	<p>Children use pictures or shapes to share quantities.</p>  <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> $8 \div 2 = 4$ </div>	<p>Share 9 buns between three people.</p> $9 \div 3 = 3$
<p>Division as grouping</p>	 <p>Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding.</p> <p>$96 \div 3 = 32$</p>    	<p>Use a number line to show jumps in groups. The number of jumps equals the number of groups.</p>  <p>Think of the bar as a whole. Split it into the number of groups you are dividing by and work out how many would be within each group.</p>  $20 \div 5 = ?$ $5 \times ? = 20$	<p>$28 \div 7 = 4$</p> <p>Divide 28 into 7 groups. How many are in each group?</p>

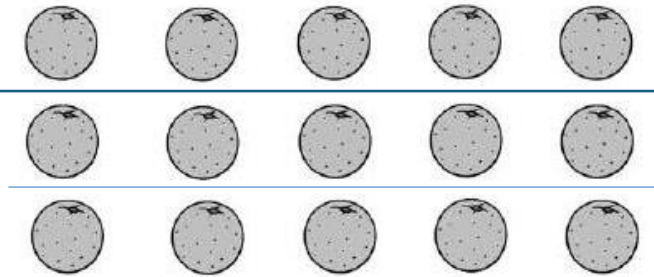
Division within arrays



Link division to multiplication by creating an array and

thinking about the number sentences that can be created.

Eg $15 \div 3 = 5$ $5 \times 3 = 15$
 $15 \div 5 = 3$ $3 \times 5 = 15$



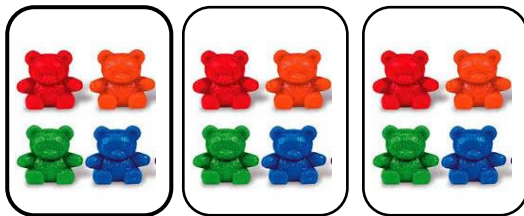
Draw an array and use lines to split the array into groups to make multiplication and division sentences.

Find the inverse of multiplication and division sentences by creating four linking number sentences.

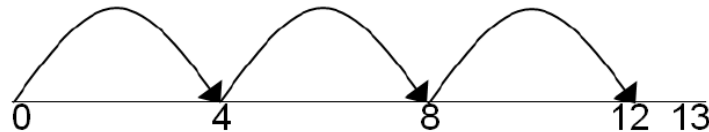
$7 \times 4 = 28$
 $4 \times 7 = 28$
 $28 \div 7 = 4$
 $28 \div 4 = 7$

Division with a remainder

$14 \div 3 =$
 Divide objects between groups and see how much is left over

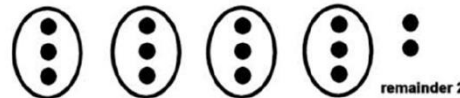


Jump forward in equal jumps on a number line then



see how many more you need to jump to find a remainder.

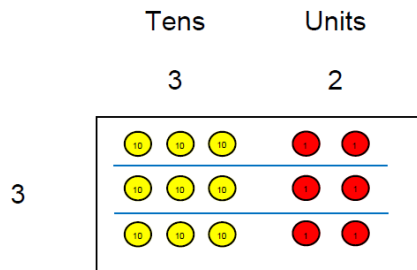
Draw dots and group them to divide an amount and clearly show a remainder.



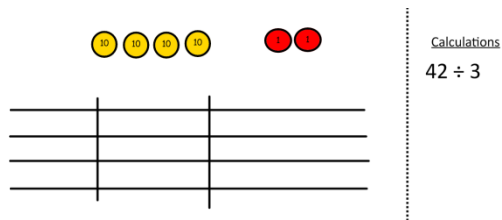
Complete written divisions and show the remainder using r.

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

Short division

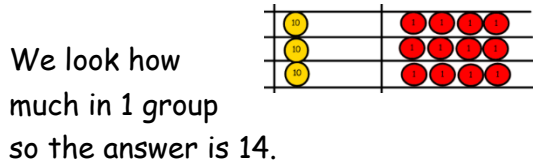
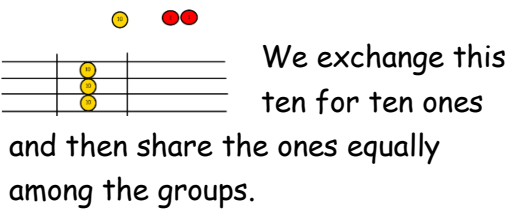


Use place value counters to divide using the bus stop method alongside

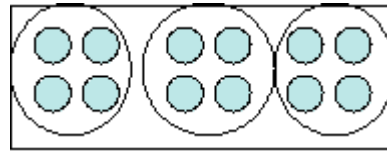


$42 \div 3 =$

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.



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.

$$\begin{array}{r} 218 \\ 3 \overline{) 4872} \end{array}$$

Move onto divisions with a remainder.

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

Finally move into decimal places to divide the total accurately.

$$\begin{array}{r} 14.6 \\ 35 \overline{) 511.0} \end{array}$$

Language used for division:

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
sharing, halving, number patterns	division, dividing, grouping, sharing, halving, array, number patterns	dividend, divisor, quotient, division, dividing, divide, divided by, divided into, grouping, sharing, share, share equally left, left over one each, two each, three each ... ten each, group in pairs, threes ... tens, equal groups of, halving, array, row, column, number patterns, division fact	division, dividing, divide, divided by, divided into, left, left over, remainder, grouping, sharing, share, share equally, one each, two each, three each ... ten each, group in pairs, threes ... tens, equal groups of, halving, array, row, column, number patterns, division fact	division, dividing, divide, divided by, divided into, left, left over, remainder, grouping, sharing, share, share equally, one each, two each, three each ... ten each, group in pairs, threes ... tens, equal groups of, halving, array, row, column, number pattern, division fact, inverse	division, dividing, divide, divided by, divided into, left, left over, remainder, grouping, sharing, share, share equally, one each, two each, three each ... ten each, group in pairs, threes ... tens, equal groups of, halving, array, row, column, number patterns, division fact, inverse, square, squared cube, cubed	division, dividing, divide, divided by, divided into, left, left over, remainder, grouping, sharing, share, share equally, one each, two each, three each ... ten each, group in pairs, threes ... tens, equal groups of, halving, array, row, column, number patterns, division fact, inverse, square, squared cube, cubed