

St. Joseph's R.C. Primary School



Teaching for Mastery Calculation Policy

September 2025

Review: September 2028

The National Curriculum 2014

Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics and a sense of enjoyment and curiosity about the subject.

The aims of this policy

Mastery is for all, and the aim of this policy is to ensure all children leave our school with a secure understanding of the four operations and can confidently use both written and mental calculation strategies in a range of contexts. It aims to ensure consistent strategies, models and images are used across the school to embed and deepen children's learning and understanding of mathematical concepts.

How should this policy be used?

This policy has been designed to support the teaching and planning of mathematics in our school. The policy only details the strategies, and teachers must plan opportunities for pupils to apply these; for example, when solving problems, or where opportunities emerge elsewhere in the curriculum. The examples and illustrations are not exhaustive but provide an overall picture of what the mathematics in our school should look like. This is not a scheme of work and must be used in conjunction with our school maths policy and curriculum documents.

This policy sets out the progression of strategies and written methods which children will be taught as they develop in their understanding of the four operations. Strategies are set out in a Concrete, Pictorial, Abstract (CPA) approach to develop children's deep understanding and mastery of mathematical concepts. Children use concrete objects to help them make sense of the concept or problem; this could be anything from real or plastic fruit, to straws, counters or cubes. This is then developed through the use of images, models and children's own pictorial representations before moving on to the abstract mathematics. Children will travel along this continuum again and again, often revisiting previous stages when a concept is extended. It is also worth noting that if a child has moved on from the concrete to the pictorial, it does not mean that the concrete cannot be used alongside the pictorial. Or if a child is working in the abstract, 'proving' something or 'working out' could involve use of the concrete or pictorial.

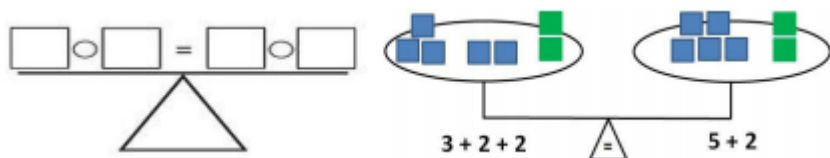
Similarly, although the strategies are taught in a progressive sequence, they are designed to equip children with a 'tool box' of skills and strategies that they can apply to solve problems in a range of contexts. So as a new strategy is taught it does not necessarily supersede the previous, but builds on prior learning to enable children to have a variety of tools to select from. As children become increasingly independent, they will be able to and must be encouraged to select those strategies which are most efficient for the task.

The strategies are separated into the 4 operations for ease of reference. However, it is intended that addition and subtraction, and multiplication and division will be taught together to ensure that children are making connections and seeing relationships in their mathematics. Therefore, some strategies will be taught simultaneously, for example, counting on (addition) and counting back (subtraction).

Children should be moved through the strategies at a pace appropriate to their age-related expectations as defined in the EYFS and NC. Effective teaching of the strategies rely on increasing levels of number sense, fluency and ability to reason mathematically. Children must be supported to gain depth of understanding within the strategy through the CPA approach and not learn strategies as a procedure.

Teaching equality

It is important that when teaching the 4 operations that equality (=) is also taught appropriately. Misconceptions that = means that children must 'do something' and that it indicates that an answer is needed are common and must be addressed early on. Teachers should present children with number sentences and problems which place the = sign in different positions, different context and include missing box problems. For example, $?+4=7$; $7=3+?$; , or $= 5+6$ ___ $7+4$. In the concrete phase. scales and Numicon provide a useful resource to demonstrate equality. Pictorial representations of equality can be used as shown below:



Importance of vocabulary

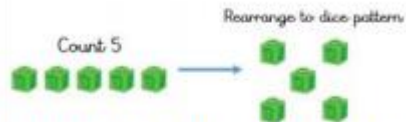
The 2014 National Curriculum places great emphasis on the importance of pupils using the correct mathematical language as a central part of their learning. Children will be unable to articulate their mathematical reasoning if they lack the mathematical vocabulary required to do so. It is therefore essential that teaching using the strategies outlined in this policy is accompanied by the use of appropriate mathematical vocabulary. New vocabulary should be introduced in a suitable context (for example, with relevant real objects, apparatus, pictures or diagrams) and explained carefully. High expectations of the mathematical language used are essential, with teachers modelling and only accepting what is correct. For example:

| Correct Terminology | Incorrect Terminology |
|--------------------------------------|------------------------------|
| ones | units |
| is equal to (is the same as) | equals |
| Zero | oh (the letter o) |
| exchange exchanging regrouping | stealing borrowing |
| calculation equation | generic term of 'sum' |
| known unknown | |
| whole part | |

EYFS – Number Have a deep understanding of number to 10, including the composition of each number

Count objects, actions and sounds.

For 1:1 counting, number sounds are clearly separated and items counted with exaggerated movements. Counted objects are rearranged in regular patterns to support quantity recognition.



Children learn that each object is counted once and the last number is the total for the set— count small sets in irregular arrangements. Progress by counting out items from larger set; objects that can't be moved; make objects not visible once counted; count movements and sounds. Counting on taught by counting two sets, then screening one of the counted sets.

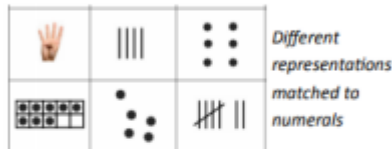


Children can count out a smaller number from a larger group: "Give me seven..." Knowing when to stop shows that children understand the cardinal principle. Build counting into everyday routines such as register time, tidying up, lining up or counting out pieces of fruit at snack time.

Link the number symbol (numeral) with its cardinal number value.

Children match numerals to different representations of number for quantities 1-10 (eg making and finding 5 in different ways)

Discuss the different ways children might record quantities (for example, scores in games), such as tallies, dots and using numeral cards.



Understand 10 as a unit

Items are counted into groups of 10, for example pipe cleaners bundled into 10s or items counted into 10-frames. Children recognise quantities in multiple 10-frames as 'how many tens, how many ones'.



Count beyond ten

Count verbally beyond 20, pausing at each multiple of 10 to draw out the structure, for instance when playing hide and seek, or to time children getting ready.

Provide images such as number tracks, calendars and hundred squares indoors and out, including painted on the ground, so children become familiar with two-digit numbers and can start to spot patterns within them.

| | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

EYFS - Number

Subitise to 5

Children recognise quantities up to 5 without counting

Show small quantities in familiar patterns (for example, dice) and random arrangements. Play games which involve quickly revealing and hiding numbers of objects. Put objects into five frames and then ten frames.



A range of representations used for quantities 1-10. Children show numbers in different ways on fingers; games used to improve finger discrimination. Quick recognition of regular and irregular dot patterns, with larger quantities visualised in two parts (e.g. see 5 as 3 and 2). Children are taught to recognise quantities on 10-frame and base-5 number track.



To recite forwards and backwards number word sequences

Forwards and backwards number word sequences supported using songs and rhymes. Children continue number sequences starting from different numbers with some prior words in appropriate range e.g. 3, 4, 5, 6... or 24, 23... The transition over 10s boundaries supported by visuals. Number tracks used, with numbers hidden to add challenge as appropriate.



Automatic recall of number bonds to 10 (including doubles)

Have a sustained focus on each number to 10. Make visual and practical displays in the classroom showing the different ways of making numbers to 10 so that children can refer to these. Spot and use opportunities for children to apply number bonds: "There are 6 of us but only 2 clipboards. How many more do we need?"

Composition of numbers to 10 Focus on composition of 2, 3, 4 and 5 before moving onto larger numbers. Provide a range of visual models of numbers: for example, six as double three on dice, or the fingers on one hand and one more, or as four and two with ten frame images.

Compare quantities up to 10 in different contexts

Provide collections to compare, starting with a very different number of things. Include more small things and fewer large things, spread them out and bunch them up, to draw attention to the number not the size of things or the space they take up. Include groups where the number of items is the same. Use vocabulary: 'more than', 'less than', 'fewer', 'the same as', 'equal to'. Encourage children to use these words as well.



Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.



EYFS – Nursery (Addition)

To make comparisons between quantities.

Which group of sweets would you like? Why?



To use language such as 'more' and 'lots of'

Please may I have some more milk?



I have a lot of conkers.



To use the language of 'more' to compare a set of objects.

Isaac has more blocks than me.



My blocks



ISAAC'S blocks

To separate a set a group of up to 5 objects in different ways.

How many different ways can we put four teddies in two beds?



To respond to (and use) addition vocabulary in rhymes and games.

Elephant song

One elephant came out to play,
Upon a spider's web one day,
He found it such enormous fun,
That he called another elephant to come



Two elephants went out to play... etc

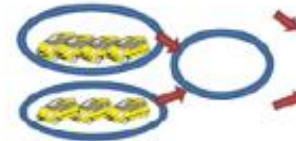


Play

Can you put one more fish in the water tray? How many are there now?



To find the total number of objects in two groups by counting the all.



Three paper plates can be used to represent part, part whole. Children move the cars together into one group to find the total amount. (starting with 0-5)

To know when counting a group that the last number represents the amount.

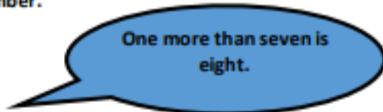


To find one more than a given amount.



EYFS – Reception (Addition)

To say the number that is one more than a given number.



Combine two or more quantities to find the total (combining)

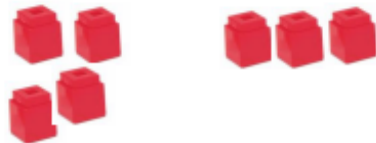


To find one more than a group of up to five, then ten objects.



One more than five is six.

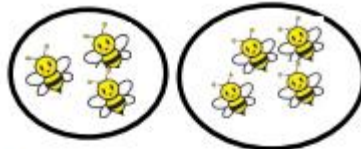
To count on when adding to a group (holding first number in head).



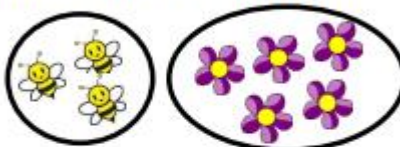
Four...

...five, six, seven

To add two sets of objects that are the same.



To add two sets of objects that are different.



Increase one quantity by a given amount to find the total (argumentation)

Maria has five sweets and she is given 3 more.
How many does she have in total?
(increase)



Records using marks they can interpret and explain.



To recognise and name + and = signs.

Add, more, plus, is equal to... altogether, total,

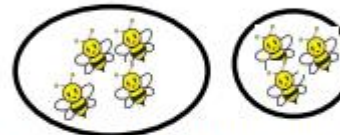
To read an addition number sentence

To read aloud $3 + 4 = 7$ knowing the correct vocabulary for the symbols + and =

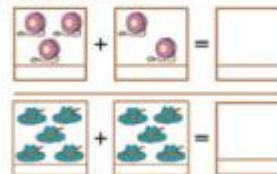
To solve an addition number calculation.

Using objects to solve.

$$4 + 3 = 7$$



To match number cards to objects to make number sentences.



To know double s to 10.

$$\begin{array}{l} 1 + 1 = 2 \\ 2 + 2 = 4 \\ 3 + 3 = 6 \end{array} \qquad \begin{array}{l} 4 + 4 = 8 \\ 5 + 5 = 10 \end{array}$$



To know number bonds of 5, 6 and 10

Part, part whole: number bonds to 5.



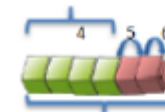
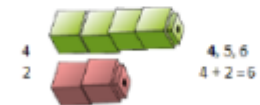
Progression towards bar model

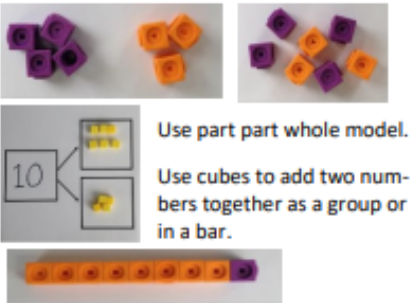
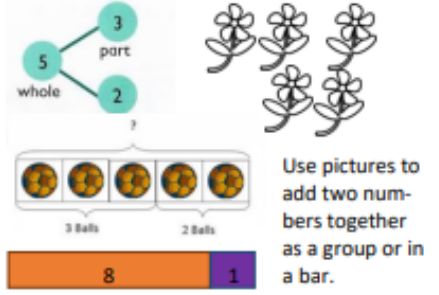


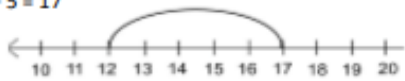
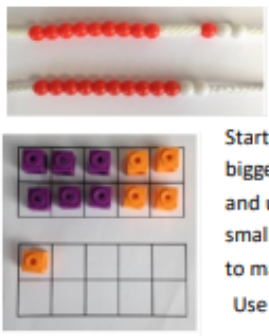
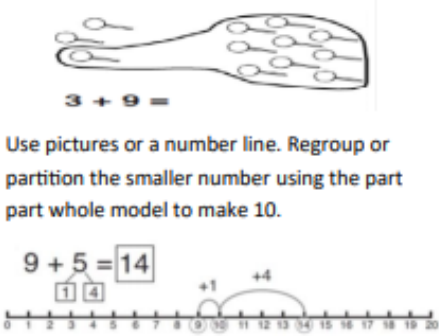

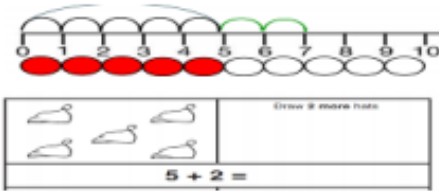
Adding objects to a group.



What is two more than 4?

Children can then use cubes, counting on from the greater number, to find the total number of cubes.



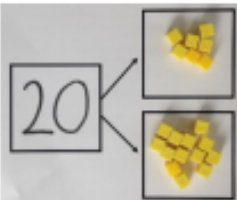
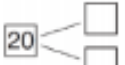
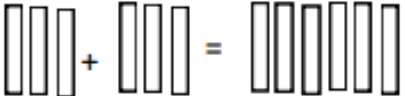
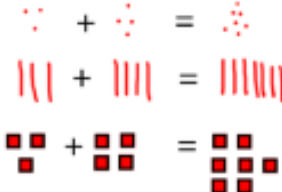


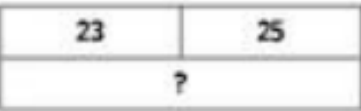


| Objective & Strategy | Concrete | Pictorial | Abstract |
|--------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Combining two parts to make a whole: part- whole model |  <p>Use part 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> | $4 + 3 = 7$  <p>Use the part-part whole diagram as shown above to move into the abstract.</p> $10 = 6 + 4$ |
| Starting at the bigger number and counting on |  <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> | $12 + 5 = 17$  <p>Start at the larger number on the number line and count on in ones or in one jump to find the answer.</p> | $5 + 12 = 17$ <p>Place the larger number in your head and count on the smaller number to find your answer.</p> |
| Regrouping to make 10. <i>This is an essential skill for column addition later.</i> |  <p>Start with the bigger number and use the smaller number to make 10.</p> <p>Use ten frames.</p> $6 + 5 = 11$ |  <p>Use pictures or a number line. Regroup or partition the smaller number using the part part whole model to make 10.</p> $9 + 5 = 14$ | $7 + 4 = 11$ <p>If I am at seven, how many more do I need to make 10. How many more do I add on now?</p> |
| Represent & use number bonds and related subtraction facts within 20 |  <p>2 more than 5.</p> |  <p>Draw 2 more ducks.</p> $5 + 2 =$ | <p>Emphasis should be on the language</p> <p>'1 more than 5 is equal to 6.'</p> <p>'2 more than 5 is 7.'</p> <p>'8 is 3 more than 5.'</p> |

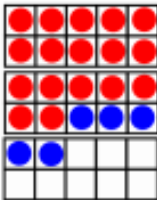
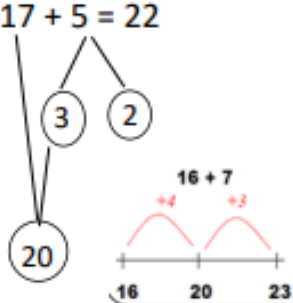

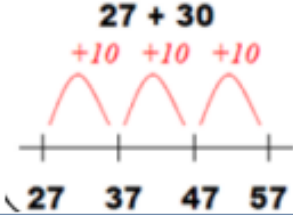

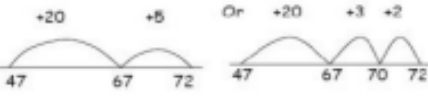

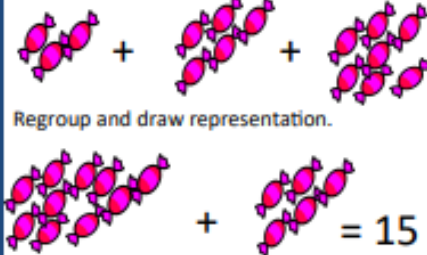
Y1

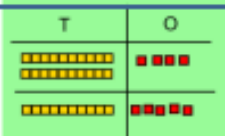
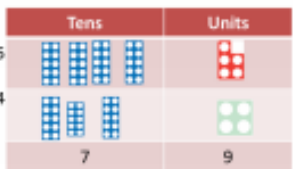
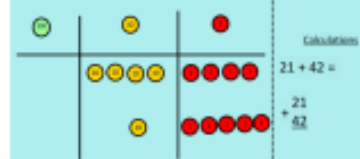

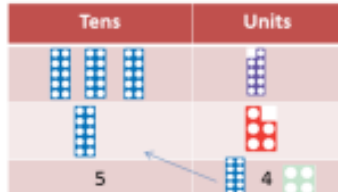
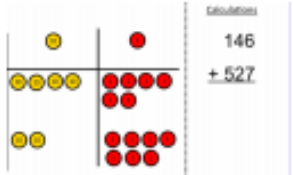
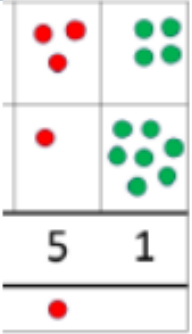
ADDITION +

Y2 ADDITION +

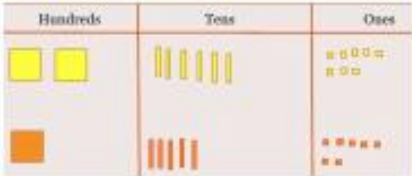
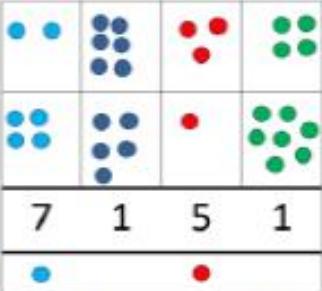
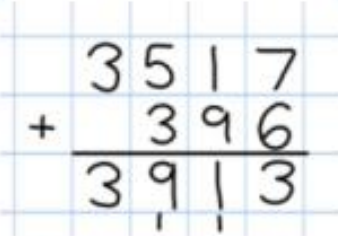
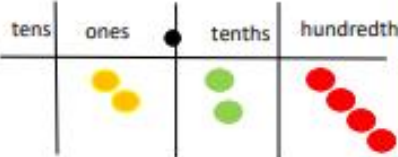
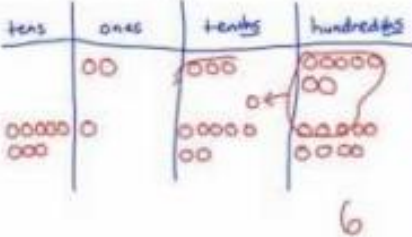

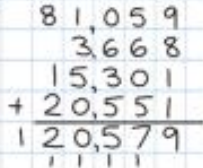

| Objective & Strategy | Concrete | Pictorial | Abstract |
|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| Adding multiples of ten | $50 = 30 + 20$  Model using dienes and bead strings |  $3 \text{ tens} + 5 \text{ tens} = \text{--- tens}$ $30 + 50 = \text{---}$ Use representations for base ten. | $20 + 30 = 50$ $70 = 50 + 20$ $40 + \square = 60$ |
| Use known number facts <i>Part part whole</i> |  Children explore ways of making numbers within 20 |  $\square + \square = 20$ $20 - \square = \square$ $\square + \square = 20$ $20 - \square = \square$ | $\square + 1 = 16$ $16 - 1 = \square$ $1 + \square = 16$ $16 - \square = 1$ |
| Using known facts | $\square\square + \square\square = \square\square\square\square$  |  Children draw representations of H,T and O | $3 + 4 = 7$ <i>leads to</i> $30 + 40 = 70$ <i>leads to</i> $300 + 400 = 700$ |
| Bar model |  $3 + 4 = 7$ |  $7 + 3 = 10$ |  $23 + 25 = 48$ |

Y2 ADDITION +

| Objective & Strategy | Concrete | Pictorial | Abstract |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Add a two digit number and ones |  <p> $17 + 5 = 22$ Use ten frame to make 'magic ten' Children explore the pattern. $17 + 5 = 22$ $27 + 5 = 32$ </p> | <p> $17 + 5 = 22$ Use part part whole and number line to model. </p>  | $17 + 5 = 22$ Explore related facts $17 + 5 = 22$ $5 + 17 = 22$ $22 - 17 = 5$ $22 - 5 = 17$ |
| Add a 2 digit number and tens |  <p> $25 + 10 = 35$ Explore that the ones digit does not change </p> | <p> $27 + 30$ $+10 +10 +10$ </p>  | $27 + 10 = 37$ $27 + 20 = 47$ $27 + \square = 57$ |
| Add two 2-digit numbers |  <p> Model using dienes, place value counters and numicon </p> |  <p> Use number line and bridge ten using part whole if necessary. </p> | <p> $25 + 47$ $20 + 5$ $40 + 7$ $20 + 40 = 60$ $5 + 7 = 12$ $60 + 12 = 72$ </p> |
| Add three 1-digit numbers |  <p> Combine to make 10 first if possible, or bridge 10 then add third digit </p> |  <p> Regroup and draw representation. </p> | <p> $4 + 7 + 6 = 10 + 7$ $= 17$ </p> <p> Combine the two numbers that make/ bridge ten then add on the third. </p> |

| Objective & Strategy | Concrete | Pictorial | Abstract |
|-------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Column Addition—no regrouping (friendly numbers)</p> <p>Add two or three 2 or 3-digit numbers.</p> | <p>Model using Dienes or numicon</p>  <p>Add together the ones first, then the tens.</p>   <p>Move to using place value counters</p> | <p>Children move to drawing the counters using a tens and one frame.</p>  | $\begin{array}{r} 223 \\ + 114 \\ \hline 337 \end{array}$ <p>Add the ones first, then the tens, then the hundreds.</p> |
| <p>Column Addition with regrouping.</p> | <p>Exchange ten ones for a ten. Model using numicon and pv counters.</p>   | <p>Children can draw a representation of the grid to further support their understanding, carrying the ten <u>underneath</u> the line</p>  | $\begin{array}{r} 20 + 5 \\ 40 + 8 \\ \hline 60 + 13 = 73 \end{array}$ <p>Start by partitioning the numbers before formal column to show the exchange.</p> $\begin{array}{r} 536 \\ + 85 \\ \hline 621 \\ 11 \end{array}$ |

Y3 ADDITION +

| Objective & Strategy | Concrete | Pictorial | Abstract |
|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Y4—add numbers with up to 4 digits</p> | <p>Children continue to use dienes or pv counters to add, exchanging ten ones for a ten and ten tens for a hundred and ten hundreds for a thousand.</p>  |  <p>Draw representations using pv grid.</p> |  <p>Continue from previous work to carry hundreds as well as tens.</p> <p>Relate to money and measures.</p> |
| <p>Y5—add numbers with more than 4 digits.</p> <p>Add decimals with 2 decimal places, including money.</p> | <p>As year 4</p>  <p>Introduce decimal place value counters and model exchange for addition.</p> | <p>2.37 + 81.79</p>  | <p>72.8</p> <p>+ 54.6</p> <hr/> <p>127.4</p> <p>11</p>  |
| <p>Y6—add several numbers of increasing complexity</p> <p>Including adding money, measure and decimals with different numbers of decimal points.</p> | <p>As Y5</p> | <p>As Y5</p> |  <p>Insert zeros for place holders.</p>  |

Y4-6

ADDITION +

EYFS – Nursery (Subtraction)

To make comparisons between quantities.

Which group of cars would you like to play with? Why?



To use the language of fewer (less) to compare a set of objects.



I have fewer sweets than Jenny.

To separate a group of up to 5 objects in different ways (total still the same)

How many different ways can we put four teddies in two beds?



To know that a group of objects changes amount when something is taken away.



To respond to (and use) subtraction vocabulary in rhymes and games.

Five little ducks

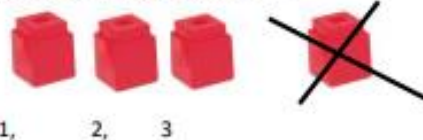


Ten green bottles

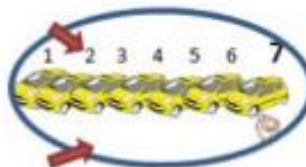
5 Little Monkeys.



To find the total number of items after some are taken away by counting all of them.



To know that when counting the last number represents the quantity.



There are seven in the group.

Composition and decomposition of number



EYFS – Reception (Subtraction)

Relates subtraction to taking away.

3 toy cars

Take away 2

Leaves 1 toy car.



To find one less than a group of up to five, then ten objects.



1 less than 6 is 5

Recording using marks they can explain and apply meaning.



Using quantities and objects to subtract single-digit numbers and count on to find the answer.



$$5 - 3 = 2$$

$$4 - 3 = 1$$

To count backwards on a number line or counting stick.



To use composition and decomposition of numbers to 10 to support this



To recognise and name - and = symbols.

Subtract, take away, minus left, part, whole, is equal to.

To read a subtraction calculation.

To read aloud $7 - 4 = 3$ knowing the correct vocabulary for the symbols - and =

To solve a subtraction calculation using objects.

$$7 - 4 = 3$$



To arrange a subtraction calculation.



$$7 - 3 = 4$$

Progression towards bar model.

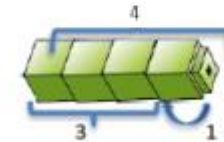
Chn to start by subtracting objects from a group.

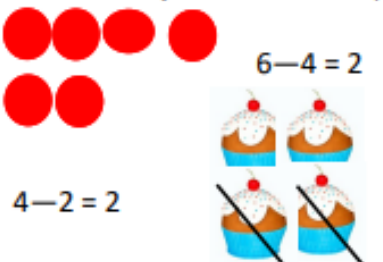
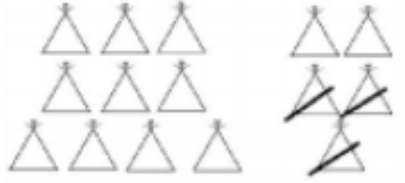
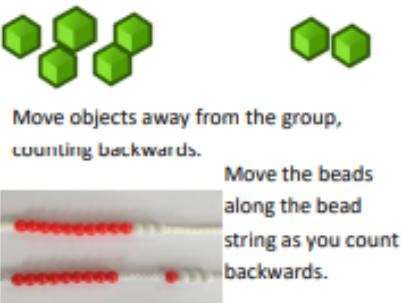
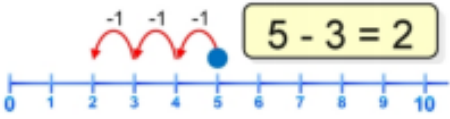
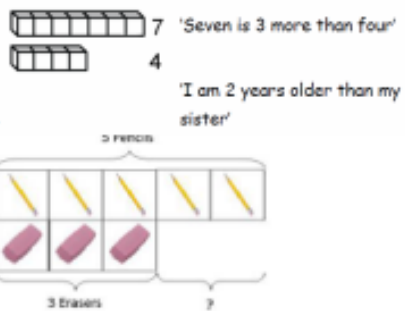
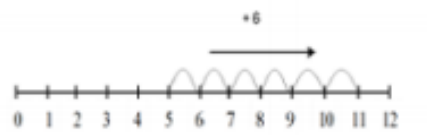


Chn using cubes, counting back from the greater number to find the total number of cubes.


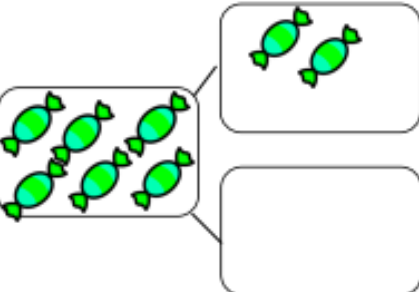


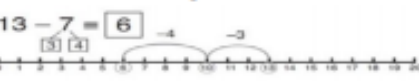

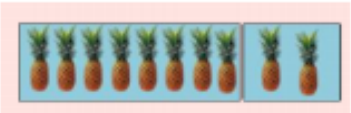



$$4 - 1 = 3$$

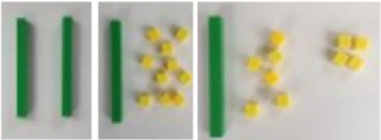
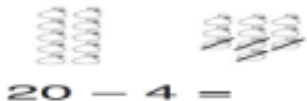


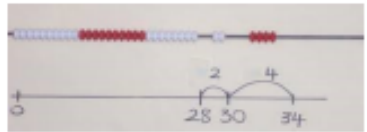
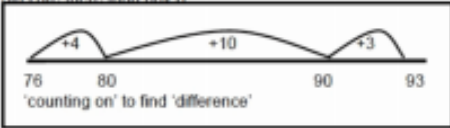


| Objective & Strategy | Concrete | Pictorial | Abstract |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| Taking away ones. | <p>Use physical objects, counters, cubes etc to show how objects can be taken away.</p>  <p>$6 - 4 = 2$</p> <p>$4 - 2 = 2$</p> |  <p>$15 - 3 = 12$</p> <p>Cross out drawn objects to show what has been taken away.</p> | <p>$7 - 4 = 3$</p> <p>$16 - 9 = 7$</p> |
| Counting back |  <p>Move objects away from the group, counting backwards.</p> <p>Move the beads along the bead string as you count backwards.</p> |  <p>$5 - 3 = 2$</p> <p>Count back in ones using a number line.</p> | <p>Put 13 in your head, count back 4. What number are you at?</p> |
| Find the Difference | <p>Compare objects and amounts</p>  <p>'Seven is 3 more than four'</p> <p>4</p> <p>'I am 2 years older than my sister'</p> <p>3 pencils</p> <p>3 Erasers</p> <p>7</p> <p>Lay objects to represent bar model.</p> | <p>Count on using a number line to find the difference.</p>  <p>+6</p> | <p>Hannah has 12 sweets and her sister has 5. How many more does Hannah have than her sister.?</p> |

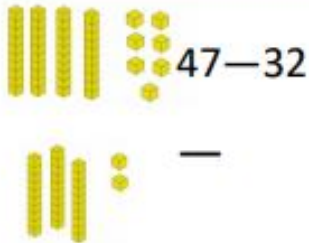
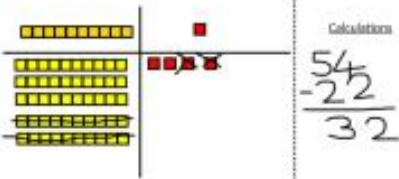

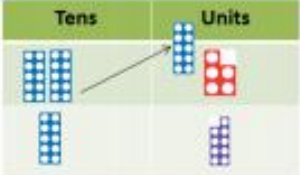
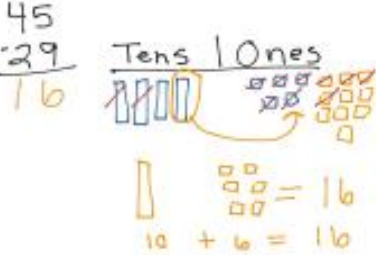

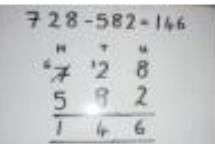
Y1 SUBTRACTION -

| Objective & Strategy | Concrete | Pictorial | Abstract |
|-------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Represent and use number bonds and related subtraction facts within 20</p> <p>Part Part Whole model</p> |  <p>Link to addition. Use PPW model to model the inverse.</p> <p>If 10 is the whole and 6 is one of the parts, what is the other part? $10 - 6 = 4$</p> |  <p>Use pictorial representations to show the part.</p> | <p>Move to using numbers within the part whole model.</p>  |
| <p>Make 10</p> | <p>14—9</p>  <p>Make 14 on the ten frame. Take 4 away to make ten, then take one more away so that you have taken 5.</p> | <p>13—7</p>  <p>Jump back 3 first, then another 4. Use ten as the stopping point.</p> | <p>16—8</p> <p>How many do we take off first to get to 10? How many left to take off?</p> |
| <p>Bar model</p> |  <p>$5 - 2 = 3$</p> |  |  <p>$10 = 8 + 2$ $10 = 2 + 8$ $10 - 2 = 8$ $10 - 8 = 2$</p> |

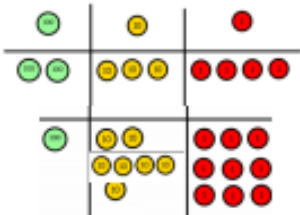
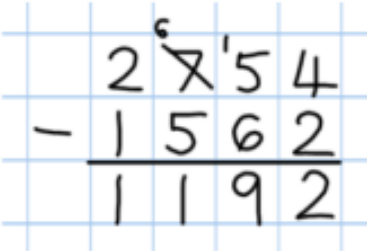
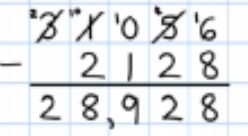
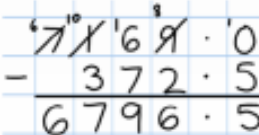
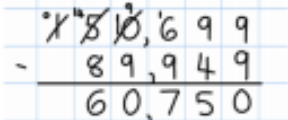
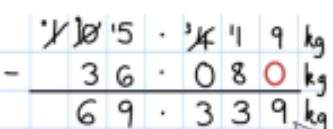
Y1 SUBTRACTION -

| Objective & Strategy | Concrete | Pictorial | Abstract |
|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| Regroup a ten into ten ones |  <p>Use a PV chart to show how to change a ten into ten ones, use the term 'take and make'</p> |  $20 - 4 =$ | $20 - 4 = 16$ |
| Partitioning to subtract without regrouping. <i>'Friendly numbers'</i> | $34 - 13 = 21$  <p>Use Dienes to show how to partition the number when subtracting without regrouping.</p> | Children draw representations of Dienes and cross off.  $43 - 21 = 22$ | $43 - 21 = 22$ |
| Make ten strategy <i>Progression should be crossing one ten, crossing more than one ten, crossing the hundreds.</i> |  $34 - 28$ <p>Use a bead bar or bead strings to model counting to next ten and the rest.</p> |  <p>Use a number line to count on to next ten and then the rest.</p> | $93 - 76 = 17$ |
| | | | |

Y2 SUBTRACTION -

| Objective & Strategy | Concrete | Pictorial | Abstract |
|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Column subtraction without regrouping (friendly numbers) |  <p>Use base 10 or Numicon to model</p> |  <p>Draw representations to support understanding</p> | $47 - 24 = 23$ $\begin{array}{r} +0+7 \\ -20+4 \\ \hline 20+3 \end{array}$ <p>Intermediate step may be needed to lead to clear subtraction understanding.</p>  |
| Column subtraction with regrouping |  <p>Begin with base 10 or Numicon. Move to pv counters, modelling the exchange of a ten into ten ones. Use the phrase 'take and make' for exchange.</p> |  <p>Children may draw base ten or PV counters and cross off.</p> |  <p>Begin by partitioning into pv columns</p>  <p>Then move to formal method.</p> |
| | | | |

Y3 SUBTRACTION -

| Objective & Strategy | Concrete | Pictorial | Abstract |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Subtracting tens and ones Year 4 subtract with up to 4 digits. <i>Introduce decimal subtraction through context of money</i> | $234 - 179$  <p>Model process of exchange using Numicon, base ten and then move to PV counters.</p> | Children to draw pv counters and show their exchange—see Y3 |  <p>Use the phrase 'take and make' for exchange</p> |
| Year 5- Subtract with at least 4 digits, including money and measures. <i>Subtract with decimal values, including mixtures of integers and decimals and aligning the decimal</i> | As Year 4 | Children to draw pv counters and show their exchange—see Y3 |  <p>Use zeros for place-holders.</p>  |
| Year 6—Subtract with increasingly large and more complex numbers and decimal values. | | |   |

Y4-6

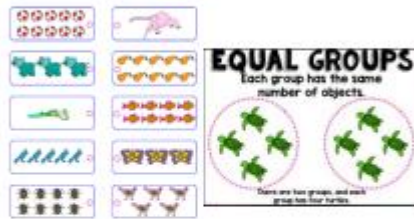
SUBTRACTION -

EYFS – Reception (Multiplication)

Children can lay out equal groups.



Can match equal groups.



Recognise when they are given equal amounts.



Double objects



Double 1 is 2

To double quantities.

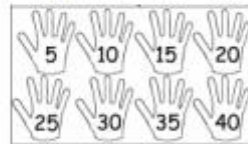
Double the cubes



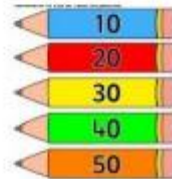
To step count in 2s



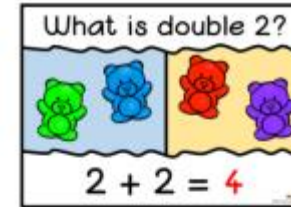
To step count in 5s



To step count in 10s



To begin to relate doubles as repeated addition.



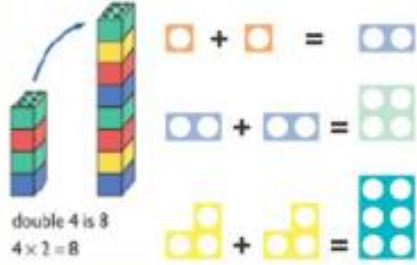

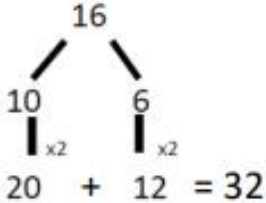
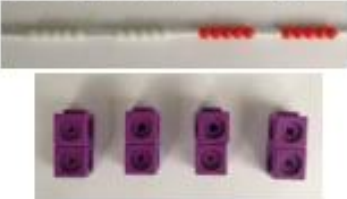
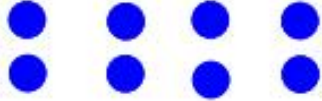
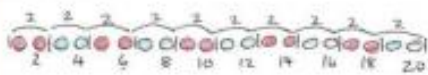



To recognise odd and even numbers.



To count objects up to 20 in arrays.

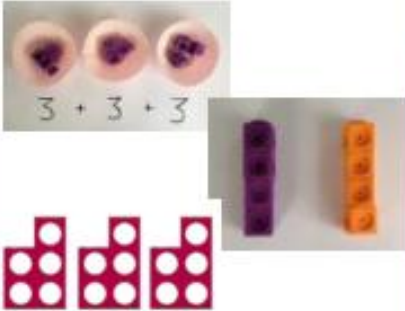
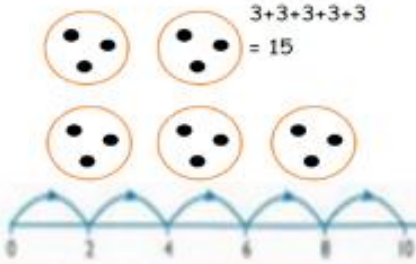

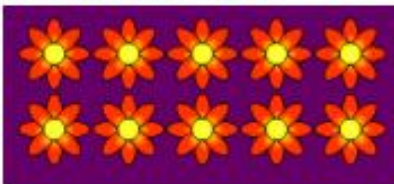
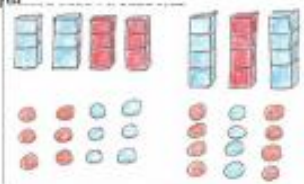


Y1 MULTIPLICATION X

| Objective & Strategy | Concrete | Pictorial | Abstract |
|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Doubling</p> | <p>Use practical activities using manipulatives including cubes and Numicon to demonstrate doubling</p>  <p>double 4 is 8 $4 \times 2 = 8$</p> | <p>Draw pictures to show how to double numbers</p> <p>Double 4 is 8</p>  | <p>Partition a number and then double each part before recombining it back together.</p>  <p>16 10 6 \swarrow \searrow 20 12 $20 + 12 = 32$</p> |
| <p>Counting in multiples</p> | <p>Count the groups as children are skip counting, children may use their fingers as they are skip counting.</p>  |  <p>Children make representations to show 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> |
| <p>Making equal groups and counting the total</p> |   <p>$\square \times \square = 8$</p> <p>Use manipulatives to create equal groups.</p> | <p>Draw  to show $2 \times 3 = 6$</p> <p>Draw and make representations</p> | <p>$2 \times 4 = 8$</p> |

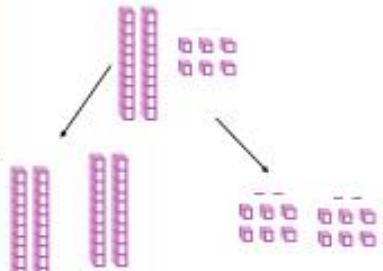
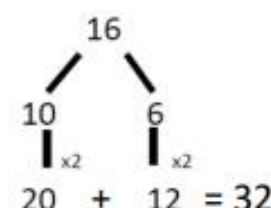
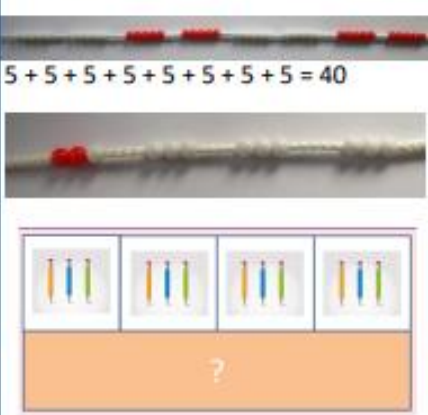
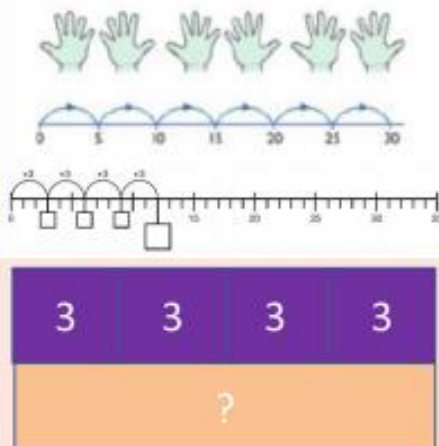
Y1

MULTIPLICATION X

| Objective & Strategy | Concrete | Pictorial | Abstract |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Repeated addition |  <p>Use different objects to add equal groups</p> | <p>Use pictorial including number lines to solve prob</p> <p>There are 3 sweets in one bag. How many sweets are in 5 bags altogether?</p> $3+3+3+3+3 = 15$  | <p>Write addition sentences to describe objects and pictures.</p>  $2+2+2+2+2 = 10$ |
| Understanding arrays | <p>Use objects laid out in arrays to find the answers to 2 lots 5, 3 lots of 2 etc.</p>  | <p>Draw representations of arrays to show understanding.</p>  | $3 \times 2 = 6$ $2 \times 5 = 10$ |
| | | | |

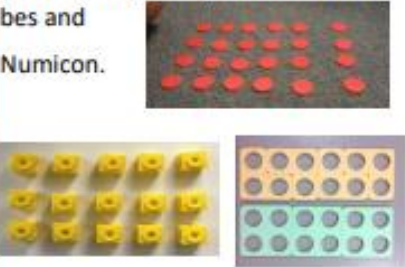

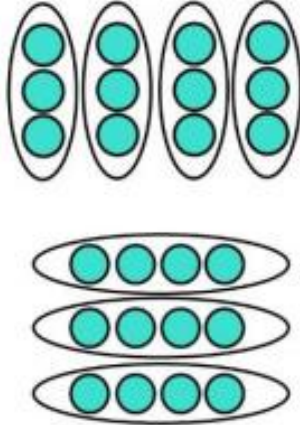


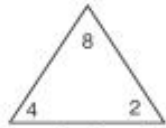
Y2

MULTIPLICATION X

| Objective & Strategy | Concrete | Pictorial | Abstract |
|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Doubling</p> | <p>Model doubling using dienes and PV counters.</p>  <p>$40 + 12 = 52$</p> | <p>Draw pictures and representations to show how to double numbers</p> | <p>Partition a number and then double each part before recombining it back together.</p>  <p>$20 + 12 = 32$</p> |
| <p>Counting in multiples of 2, 3, 4, 5, 10 from 0 (repeated addition)</p> | <p>Count the groups as children are skip counting, children may use their fingers as they are skip counting. Use bar models.</p>  <p>$5 + 5 + 5 + 5 + 5 + 5 + 5 = 40$</p> | <p>Number lines, counting sticks and bar models should be used to show representation of counting in multiples.</p>  | <p>Count in multiples of a number aloud.</p> <p>Write sequences with multiples of numbers.</p> <p>0, 2, 4, 6, 8, 10 0, 3, 6, 9, 12, 15 0, 5, 10, 15, 20, 25, 30</p> <p>$4 \times 3 = \square$</p> |

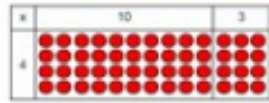
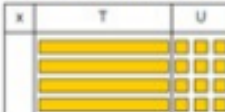

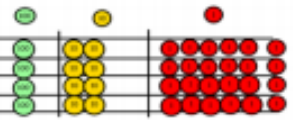
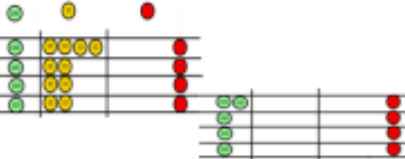
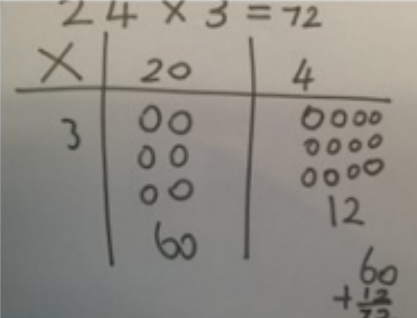
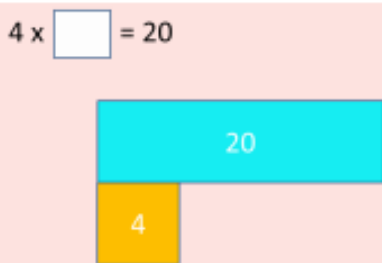
Y2

MULTIPLICATION X

| Objective & Strategy | Concrete | Pictorial | Abstract |
|---------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Multiplication is commutative | <p>Create arrays using counters and cubes and Numicon.</p>  <p>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.</p>  | <p>Use representations of arrays to show different calculations and explore commutativity.</p>  | $12 = 3 \times 4$ $12 = 4 \times 3$ <p>Use an array to write multiplication sentences and reinforce repeated addition.</p>  $5 + 5 + 5 = 15$ $3 + 3 + 3 + 3 + 3 = 15$ $5 \times 3 = 15$ $3 \times 5 = 15$ |
| Using the Inverse <i>This should be taught alongside division, so pupils learn how they work alongside each other.</i> |  |  $\square \times \square = \square$ $\square \times \square = \square$ $\square \div \square = \square$ $\square \div \square = \square$ | $2 \times 4 = 8$ $4 \times 2 = 8$ $8 \div 2 = 4$ $8 \div 4 = 2$ $8 = 2 \times 4$ $8 = 4 \times 2$ $2 = 8 \div 4$ $4 = 8 \div 2$ <p>Show all 8 related fact family sentences.</p> |

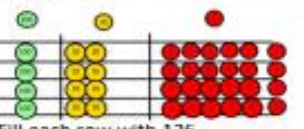
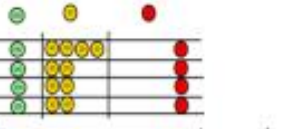
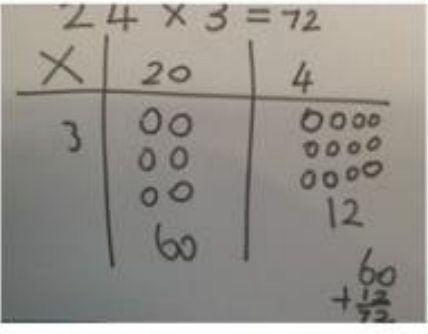
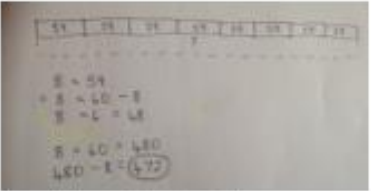
Y3

MULTIPLICATION X

| Objective & Strategy | Concrete | Pictorial | Abstract | | | | | | | | | | | | | | | |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|---|---|-----|----|--|----|---|----|-----|----|---|----|----|
| <p>Grid method</p> | <p>Show the links with arrays to first introduce the grid method</p>  <p>4 rows of 10 4 rows of 3</p> <p>Move onto base ten to move towards a more compact method.</p>  <p>4 rows of 13</p> <p>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</p>  <p>Calculations 4×126</p> <p>Fill each row with 126</p>  <p>Calculations 4×126</p> <p>Add up each column, starting with the ones making any exchanges needed</p>  <p>Then you have your answer.</p> | <p>Children can represent their work with place value counters in a way that they understand.</p> <p>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.</p>  <p>Bar model are used to explore missing numbers</p>  | <p>Start with multiplying by one digit numbers and showing the clear addition alongside the grid.</p> <table border="1" data-bbox="1467 446 1747 526"> <tr> <td>x</td> <td>30</td> <td>5</td> </tr> <tr> <td>7</td> <td>210</td> <td>35</td> </tr> </table> <p>$210 + 35 = 245$</p> <p>Moving forward, multiply by a 2 digit number showing the different rows within the grid method.</p> <table border="1" data-bbox="1467 782 1736 957"> <tr> <td></td> <td>10</td> <td>8</td> </tr> <tr> <td>10</td> <td>100</td> <td>80</td> </tr> <tr> <td>3</td> <td>30</td> <td>24</td> </tr> </table> | x | 30 | 5 | 7 | 210 | 35 | | 10 | 8 | 10 | 100 | 80 | 3 | 30 | 24 |
| x | 30 | 5 | | | | | | | | | | | | | | | | |
| 7 | 210 | 35 | | | | | | | | | | | | | | | | |
| | 10 | 8 | | | | | | | | | | | | | | | | |
| 10 | 100 | 80 | | | | | | | | | | | | | | | | |
| 3 | 30 | 24 | | | | | | | | | | | | | | | | |

Y4

MULTIPLICATION X

| Objective & Strategy | Concrete | Pictorial | Abstract | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----|---|---|-----|----|--|--|--|--|--|--|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-----|----|---|---|------|----|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|--|---|---|--|-------|--|--|--|----|--|--|----|--|--|------|--|--|------|--|--|-----|--|---|---|--|-------|--|--|--|------|--|
| <p>Grid method recap from year 3 for 2 digits x 1 digit</p> <p>Move to multiplying 3 digit numbers by 1 digit. (year 4 expectation)</p> | <p>Use place value counters to show how we are finding groups of a number. We are multiplying by 4 so we need 4 rows</p>  <p>Calculations 4×126</p> <p>Fill each row with 126</p>  <p>Add up each column making any exchanges needed</p> | <p>Children can represent their work with place value counters in a way that they understand.</p> <p>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.</p>  | <p>Start with multiplying by one digit numbers and showing the clear addition alongside the grid.</p> <table border="1" data-bbox="1467 438 1747 526"> <tr> <td>x</td> <td>30</td> <td>5</td> </tr> <tr> <td>7</td> <td>210</td> <td>35</td> </tr> </table> <p>$210 + 35 = 245$</p> | x | 30 | 5 | 7 | 210 | 35 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| x | 30 | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | 210 | 35 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Column multiplication</p> | <p>Children can continue to be supported by place value counters at the stage of multiplication. This initially done where there is no regrouping. $321 \times 2 = 642$</p> <table border="1" data-bbox="504 981 784 1316"> <thead> <tr> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>It is important at this stage that they always multiply the ones first.</p> <p>The corresponding long multiplication is modelled alongside</p> | Hundreds | Tens | Ones | | | | | | | | | | | | | <table border="1" data-bbox="1019 885 1310 957"> <tr> <td>x</td> <td>300</td> <td>20</td> <td>7</td> </tr> <tr> <td>4</td> <td>1200</td> <td>80</td> <td>28</td> </tr> </table> <p>The grid method may be used to show how this relates to a formal written method.</p>  <p>Bar modelling and number lines can support learners when solving problems with multiplication alongside the formal written methods.</p> | x | 300 | 20 | 7 | 4 | 1200 | 80 | 28 | <table data-bbox="1523 861 1680 1189"> <tr> <td></td> <td>327</td> <td></td> </tr> <tr> <td>x</td> <td>4</td> <td></td> </tr> <tr> <td colspan="3"><hr/></td> </tr> <tr> <td></td> <td>28</td> <td></td> </tr> <tr> <td></td> <td>80</td> <td></td> </tr> <tr> <td></td> <td>1200</td> <td></td> </tr> <tr> <td></td> <td>1308</td> <td></td> </tr> </table> <p>This may lead to a compact method.</p> <table border="1" data-bbox="1422 1220 1624 1372"> <tr> <td></td> <td>327</td> <td></td> </tr> <tr> <td>x</td> <td>4</td> <td></td> </tr> <tr> <td colspan="3"><hr/></td> </tr> <tr> <td></td> <td>1308</td> <td></td> </tr> </table> | | 327 | | x | 4 | | <hr/> | | | | 28 | | | 80 | | | 1200 | | | 1308 | | | 327 | | x | 4 | | <hr/> | | | | 1308 | |
| Hundreds | Tens | Ones | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| x | 300 | 20 | 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 1200 | 80 | 28 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 327 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| x | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <hr/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 28 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 80 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1200 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1308 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 327 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| x | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <hr/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1308 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Y5-6

MULTIPLICATION X

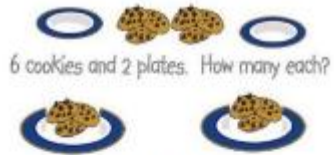
| Objective & Strategy | Concrete | Pictorial | Abstract | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------|---|----|-----|----|---|----|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---|---|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-----|----|---|---|------|----|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| <p>Column Multiplication for 3 and 4 digits x 1 digit.</p> | <table border="1" style="width: 100%; text-align: center;"> <tr> <td style="background-color: #f08080;">Hundreds</td> <td style="background-color: #90ee90;">Tens</td> <td style="background-color: #66b3ff;">Ones</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table> <p>It is important at this stage that they always multiply the ones first.</p> <p>Children can continue to be supported by place value counters at the stage of multiplication. This initially done where there is no regrouping. $321 \times 2 = 642$</p> | Hundreds | Tens | Ones | | | | | | | | | | | | | <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>x</td> <td>300</td> <td>20</td> <td>7</td> </tr> <tr> <td>4</td> <td>1200</td> <td>80</td> <td>28</td> </tr> </table> <p style="text-align: center; color: red; font-size: 2em;">➔</p> | x | 300 | 20 | 7 | 4 | 1200 | 80 | 28 | $\begin{array}{r} 327 \\ \times 4 \\ \hline 1208 \end{array}$ <p style="text-align: center; color: red; font-size: 2em;">↻</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>3</td><td>2</td><td>7</td></tr> <tr><td>x</td><td></td><td>4</td></tr> <tr><td>1</td><td>3</td><td>0</td><td>8</td></tr> <tr><td></td><td>1</td><td>2</td><td></td></tr> </table> <p>This will lead to a compact method.</p> | 3 | 2 | 7 | x | | 4 | 1 | 3 | 0 | 8 | | 1 | 2 | | | | | | | | | | | | | |
| Hundreds | Tens | Ones | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| x | 300 | 20 | 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 1200 | 80 | 28 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 2 | 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| x | | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 3 | 0 | 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Column multiplication</p> | <p>Manipulatives may still be used with the corresponding long multiplication modelled alongside.</p> | <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td>10</td> <td>8</td> </tr> <tr> <td>10</td> <td style="background-color: #ff4500;">100</td> <td style="background-color: #ff4500;">80</td> </tr> <tr> <td>3</td> <td style="background-color: #ff4500;">30</td> <td style="background-color: #ff4500;">24</td> </tr> </table> <p style="text-align: center; color: red; font-size: 2em;">➔</p> <p>Continue to use bar modelling to support problem solving</p> | | 10 | 8 | 10 | 100 | 80 | 3 | 30 | 24 | <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td></td><td>1</td><td>8</td></tr> <tr><td>x</td><td>1</td><td>3</td></tr> <tr><td></td><td>5</td><td>4</td></tr> <tr><td></td><td>2</td><td></td></tr> <tr><td>1</td><td>8</td><td>0</td></tr> <tr><td>2</td><td>3</td><td>4</td></tr> </table> <p>18 x 3 on the first row (8 x 3 = 24, carrying the 2 for 20, then 1 x 3)</p> <p>18 x 10 on the 2nd row. Show multiplying by 10 by putting zero in units first</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>x</td><td></td><td>1</td><td>6</td></tr> <tr><td>7</td><td>4</td><td>0</td><td>4</td></tr> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>0</td></tr> <tr><td>1</td><td>9</td><td>7</td><td>4</td><td>4</td></tr> </table> <p>(1234 x 6) (1234 x 10)</p> | | 1 | 8 | x | 1 | 3 | | 5 | 4 | | 2 | | 1 | 8 | 0 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | x | | 1 | 6 | 7 | 4 | 0 | 4 | 1 | 2 | 3 | 4 | 0 | 1 | 9 | 7 | 4 | 4 |
| | 10 | 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | 100 | 80 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 30 | 24 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 | 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| x | 1 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 5 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 8 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| x | | 1 | 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | 4 | 0 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 9 | 7 | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Objective & Strategy | Concrete | Pictorial | Abstract |
|-----------------------------------------------------------------------|----------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Multiplying decimals up to 2 decimal places by a single digit.</p> | | | <p>Remind children that the single digit belongs in the units column. Line up the decimal points in the question and the answer.</p> $ \begin{array}{r} 3.19 \\ \times 8 \\ \hline 25.52 \end{array} $ |

Y6 MULTIPLICATION X

EYFS – Reception (Division)

To share objects between two people equally



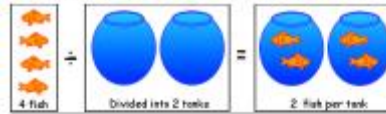
To group objects in to equal groups.



To halve equal numbers up to 10



To share an even group equally between 2.



To share an even group between 3 or 4.



To identify odd and even numbers



To count up to 20 in arrays.




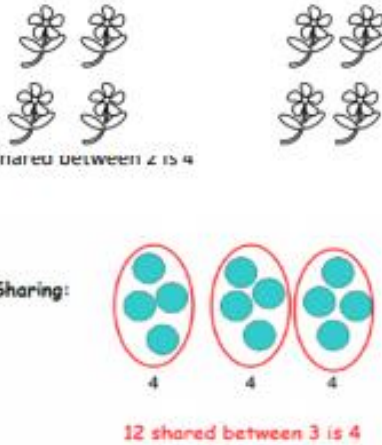
To problem solve with grouping and sharing.

How should we put the seeds in these four pots?
Is there a way so that we'll have the same? Are there any left over?



Can we share out these sweets fairly? How shall we do it?
Between 2 people? What would happen if it was between 3 people?



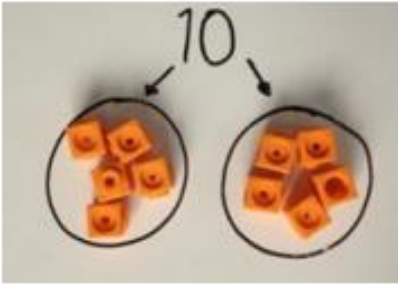

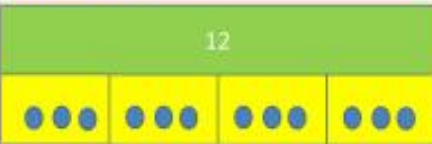


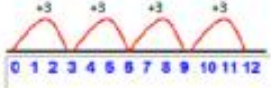


| Objective & Strategy | Concrete | Pictorial | Abstract |
|-----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| Division as sharing <i>Use Gordon ITPs for modelling</i> |  <p data-bbox="504 1241 936 1297">I have 10 cubes, can you share them equally in 2 groups?</p> | <p data-bbox="949 323 1406 379">Children use pictures or shapes to share quantities.</p>  | <p data-bbox="1420 331 1848 371">12 shared between 3 is</p> <p data-bbox="1621 400 1648 435">4</p> |

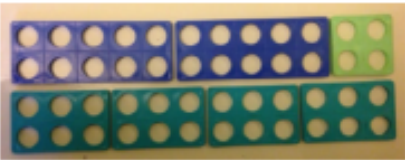



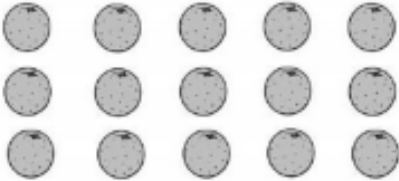
Y1

DIVISION ÷

Y2

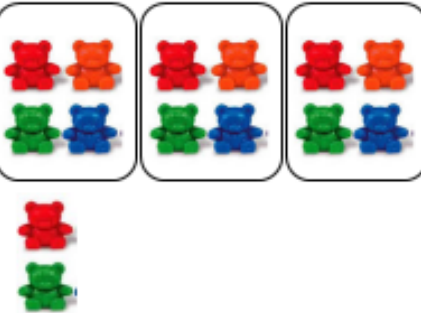


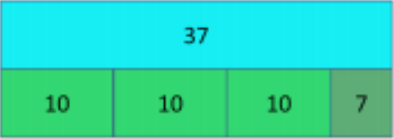
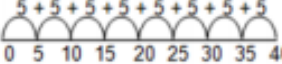
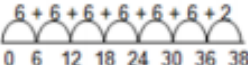
DIVISION ÷

| Objective & Strategy | Concrete | Pictorial | Abstract |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| Division as sharing |  <p>I have 10 cubes, can you share them equally in 2 groups?</p> | <p>Children use pictures or shapes to share quantities.</p>  $8 \div 2 = 4$ <p>Children use bar modelling to show and support understanding.</p>  $12 \div 4 = 3$ | $12 \div 3 = 4$ |
| Division as grouping | <p>Divide quantities into equal groups.</p> <p>Use cubes, counters, objects or place value counters to aid understanding.</p>   | <p>Use number lines for grouping</p>   $12 \div 3 = 4$ <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>  $20 \div 5 = ?$ $5 \times ? = 20$ | $28 \div 7 = 4$ <p>Divide 28 into 7 groups. How many are in each group?</p> |

| Objective & Strategy | Concrete | Pictorial | Abstract |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Division as grouping | <p>Use cubes, counters, objects or place value counters to aid understanding.</p>  <p>24 divided into groups of 6 = 4</p> $96 \div 3 = 32$  | <p>Continue to use bar modelling to aid solving division problems.</p>  <p>20</p> $20 \div 5 = ?$ $5 \times ? = 20$ | <p>How many groups of 6 in 24?</p> $24 \div 6 = 4$ |
| Division with arrays |  <p>Link division to multiplication by creating an array and thinking about the number sentences that can be created.</p> <p>Eg $15 \div 3 = 5$ $5 \times 3 = 15$ $15 \div 5 = 3$ $3 \times 5 = 15$</p> | <p>Draw an array and use lines to split the array into groups to make multiplication and division sentences</p>  | <p>Find the inverse of multiplication and division sentences by creating eight linking number sentences.</p> $7 \times 4 = 28$ $4 \times 7 = 28$ $28 \div 7 = 4$ $28 \div 4 = 7$ $28 = 7 \times 4$ $28 = 4 \times 7$ $4 = 28 \div 7$ $7 = 28 \div 4$ |

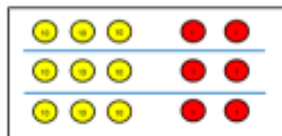




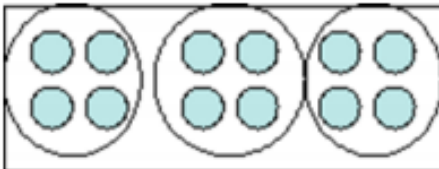
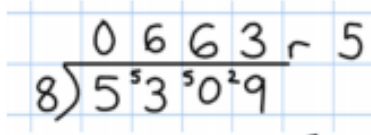
Y3

DIVISION ÷

| Objective & Strategy | Concrete | Pictorial | Abstract |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Division with remainders. | <p>$14 \div 3 =$</p> <p>Divide objects between groups and see how much is left over</p>  | <p>Jump forward in equal jumps on a number line then see how many more you need to jump to find a remainder.</p>  <p>Draw dots and group them to divide an amount and clearly show a remainder.</p>  <p>Use bar models to show division with remainders.</p>  <p>Example without remainder: $40 \div 5$ Ask "How many 5s in 40?" $5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 = 8 \text{ fives}$</p>  <p>Example with remainder: $38 \div 6$</p>  <p>For larger numbers, when it becomes inefficient to count in single multiples, bigger jumps can be recorded using known facts.</p> | <p>Complete written divisions and show the remainder using r.</p> $29 \div 8 = 3 \text{ REMAINDER } 5$ <p> \uparrow \uparrow \uparrow \uparrow dividend divisor quotient remainder </p> |

Y3

DIVISION ÷

| Objective & Strategy | Concrete | Pictorial | Abstract |
|-------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Divide at least 3 digit numbers by 1 digit. Short Division | <p>$96 \div 3$</p> <p>Tens Units</p> <p>3 2</p>  <p>Use place value counters to divide using the bus stop method alongside</p>  <p>$42 \div 3 =$</p> <p>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.</p>   <p>We exchange this ten for ten ones and then share the ones equally among the groups.</p>  <p>We look how much in 1 group so the answer is 14.</p> | <p>Students can continue to use drawn diagrams with dots or circles to help them divide numbers into equal groups.</p>  <p>Encourage them to move towards counting in multiples to divide more efficiently.</p> | <p>Begin with divisions that divide equally with no remainder.</p> $\begin{array}{r} 218 \\ 3 \overline{) 872} \end{array}$ <p>Move onto divisions with a remainder.</p> $\begin{array}{r} 86 \text{ r } 2 \\ 5 \overline{) 432} \end{array}$ <p>Finally move into decimal places to divide the total accurately.</p> $\begin{array}{r} 14.6 \\ 35 \overline{) 511.0} \end{array}$  |

Y4-6

DIVISION ÷

Long Division

Step 1—a remainder in the ones

$$\begin{array}{r} \text{h t o} \\ 041 \text{ R}1 \\ \hline 4 \overline{) 165} \end{array}$$

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

4 goes into 16 four times.

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

$$\begin{array}{r} \text{th h t o} \\ 0400 \text{ R}7 \\ \hline 8 \overline{) 3207} \end{array}$$

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

8 goes into 32 four times ($3,200 \div 8 = 400$)

8 goes into 0 zero times (tens).

8 goes into 7 zero times, and leaves a remainder of 7.

Y6

DIVISION ÷

Long Division

Step 1 continued...

$$\begin{array}{r} \text{h t o} \\ 061 \\ 4 \overline{) 247} \\ \underline{-4} \\ 3 \end{array}$$

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

Check: $4 \times 61 + 3 = 247$

$$\begin{array}{r} \text{th h t o} \\ 0402 \\ 4 \overline{) 1609} \\ \underline{-8} \\ 1 \end{array}$$

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

Check: $4 \times 402 + 1 = 1,609$

Y6

DIVISION ÷

Long Division

Step 2—a remainder in the tens

| 1. Divide. | 2. Multiply & subtract. | 3. Drop down the next digit. |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $\begin{array}{r} \text{t o} \\ 2 \overline{) 58} \end{array}$ <p>Two goes into 5 two times, or 5 tens → 2 = 2 whole tens -- but there is a remainder!</p> | $\begin{array}{r} \text{t o} \\ 2 \overline{) 58} \\ -4 \\ \hline 1 \end{array}$ <p>To find it, multiply $2 \times 2 = 4$, write that 4 under the five, and subtract to find the remainder of 1 ten.</p> | $\begin{array}{r} \text{t o} \\ 2 \overline{) 58} \\ -4 \downarrow \\ \hline 18 \end{array}$ <p>Next, drop down the 8 of the ones next to the leftover 1 ten. You combine the remainder ten with 8 ones, and get 18.</p> |

| 1. Divide. | 2. Multiply & subtract. | 3. Drop down the next digit. |
|---------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $\begin{array}{r} \text{t o} \\ 2 \overline{) 58} \\ -4 \\ \hline 18 \end{array}$ <p>Divide 2 into 18. Place 9 into the quotient.</p> | $\begin{array}{r} \text{t o} \\ 2 \overline{) 58} \\ -4 \\ \hline 18 \\ -18 \\ \hline 0 \end{array}$ <p>Multiply $9 \times 2 = 18$, write that 18 under the 18, and subtract.</p> | $\begin{array}{r} \text{t o} \\ 2 \overline{) 58} \\ -4 \\ \hline 18 \\ -18 \\ \hline 0 \end{array}$ <p>The division is over since there are no more digits in the dividend. The quotient is 29.</p> |

Y6

DIVISION ÷

Long Division

Step 2—a remainder in any of the place values

| 1. Divide. | 2. Multiply & subtract. | 3. Drop down the next digit. |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $\begin{array}{r} \text{h t o} \\ 1 \\ 2 \overline{) 278} \end{array}$ <p>Two goes into 2 one time, or 2 hundreds + 2 = 1 hundred.</p> | $\begin{array}{r} \text{h t o} \\ 1 \\ 2 \overline{) 278} \\ -2 \\ \hline 0 \end{array}$ <p>Multiply $1 \times 2 = 2$, write that 2 under the two, and subtract to find the remainder of zero.</p> | $\begin{array}{r} \text{h t o} \\ 18 \\ 2 \overline{) 278} \\ -2 \\ \hline 07 \end{array}$ <p>Next, drop down the 7 of the tens next to the zero.</p> |
| Divide. | Multiply & subtract. | Drop down the next digit. |
| $\begin{array}{r} \text{h t o} \\ 13 \\ 2 \overline{) 278} \\ -2 \\ \hline 07 \end{array}$ <p>Divide 2 into 7. Place 3 into the quotient.</p> | $\begin{array}{r} \text{h t o} \\ 13 \\ 2 \overline{) 278} \\ -2 \\ \hline 07 \\ -6 \\ \hline 1 \end{array}$ <p>Multiply $3 \times 2 = 6$, write that 6 under the 7, and subtract to find the remainder of 1 ten.</p> | $\begin{array}{r} \text{h t o} \\ 13 \\ 2 \overline{) 278} \\ -2 \\ \hline 07 \\ -6 \\ \hline 18 \end{array}$ <p>Next, drop down the 8 of the ones next to the 1 leftover ten.</p> |
| 1. Divide. | 2. Multiply & subtract. | 3. Drop down the next digit. |
| $\begin{array}{r} \text{h t o} \\ 139 \\ 2 \overline{) 278} \\ -2 \\ \hline 07 \\ -6 \\ \hline 18 \end{array}$ <p>Divide 2 into 18. Place 9 into the quotient.</p> | $\begin{array}{r} \text{h t o} \\ 139 \\ 2 \overline{) 278} \\ -2 \\ \hline 07 \\ -6 \\ \hline 18 \\ -18 \\ \hline 0 \end{array}$ <p>Multiply $9 \times 2 = 18$, write that 18 under the 18, and subtract to find the remainder of zero.</p> | $\begin{array}{r} \text{h t o} \\ 139 \\ 2 \overline{) 278} \\ -2 \\ \hline 07 \\ -6 \\ \hline 18 \\ -18 \\ \hline 0 \end{array}$ <p>There are no more digits to drop down. The quotient is 139.</p> |

Y6

DIVISION ÷