East Sheen Primary School

Calculation Policy

Dated: June 2020

Introduction

This policy explains the calculation strategies taught at East Sheen Primary School in both mental and written mathematics to meet the requirements of the National Curriculum 2014 for the teaching and learning of mathematics.

It is designed to give pupils a consistent and smooth progression of learning in calculations across the school. Please note that early learning in number and calculation in Reception follows the ‘Development Matters’ EYFS document, and this calculation policy is designed to build on progressively from the content and methods established in the Early Years Foundation Stage.

The stages are shown in order of their teaching progression and the year groups in which they would typically be taught. However the timescale for teaching each method will depend upon the development of the children in any particular group or year cohort. It is very important that children are given time to develop a depth of understanding of the mathematics they are using before they move onto further more abstract methods and they should not be discouraged from using previously taught methods in which they are secure whilst new concepts are being embedded. To support the development of their understanding of the different methods a variety of concrete and pictorial models and images are used prior to progression onto the abstract representation and problems are presented in a variety of contexts, in order to enable children to develop the ability to transfer their knowledge and understand and appreciate the relevance of maths in everyday life.

The long-term intent of the policy is for the children to be able to select an appropriate and efficient method to tackle any given problem. To do this they need to ask themselves:

- Can I do this in my head?
- Can I do this in my head using drawings or jottings to help me?
- Do I need to use a written method?
- Which method is the best to use?

Mental Methods.

Oral and mental work in mathematics is essential. **The ability to calculate mentally forms the basis of all methods of calculation and should be seen as being complementary to written methods.** In every written method there is an element of mental processing but written recording helps children to clarify their thinking and assists the development of more fluent and sophisticated processes.

When we discuss mental calculations in maths at KS2, we need to be clear about the distinction between facts that children should be able to rapidly recall vs the types of calculations that children should be able to **calculate** mentally, sometimes with the support of jottings.

Rapid recall of number facts is important because if children are able to recall number facts automatically (in other words, they **gain automaticity** in these facts) it allows them to free up their **working memory** when faced with questions and problems across the whole maths curriculum.

Early practical, oral and mental work lays the foundations by providing children with a secure knowledge of place value and number facts whilst later work ensures that children recognise how operations relate to each other and how the rules of arithmetic are used and applied. Ongoing mental and oral work provides structured practise and repetition of mental skills and helps to consolidate understanding and recall of key number facts.

Children need to develop to skills to:

- Recall number facts instantly – eg. addition and subtraction facts for each number to 10/20, sums and differences of multiples of 10, doubles, halves and multiplication facts.
- Use taught strategies to work out a calculation – eg . recognise that addition can be done in any order and use this to mentally add a one–digit number or a multiple of 10 to a 2-digit number, or partition numbers into their tens and ones to add them and then recombine them to reach an answer.

The following pages detail the progression in learning for each of the four operations – addition, subtraction, multiplication and division Children with identified special educational needs follow the same progression, using the concrete, pictorial and abstract approach. However, in order to consolidate their understanding, they may be working at a slower rate through the programme than the academic year group in which they are based.

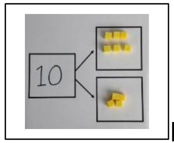
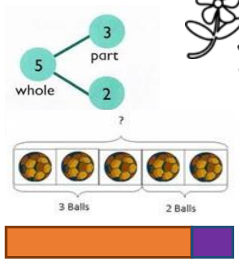
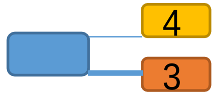
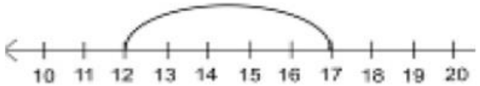
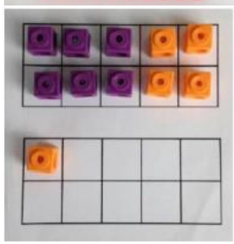
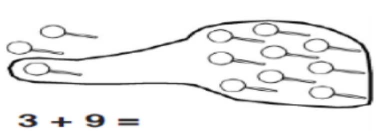
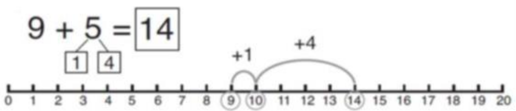
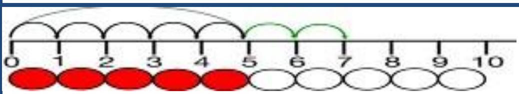
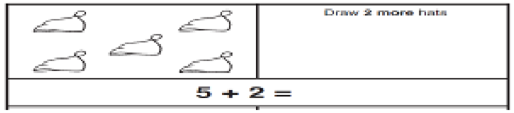
A separate document, 'Progression in mental calculations' sets out the progression in learning for the specific mental strategies.

This policy has been largely adapted from the White Rose Maths Hub Calculation Policy .

It is a working document and will be revised and

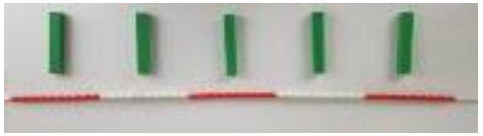
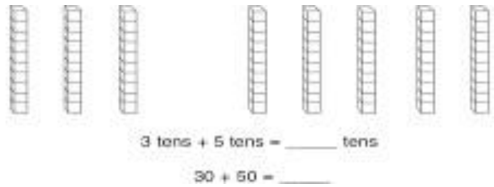
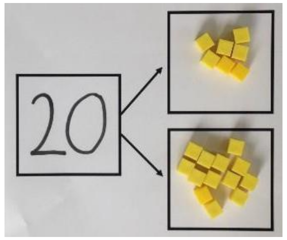
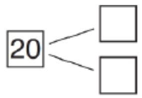
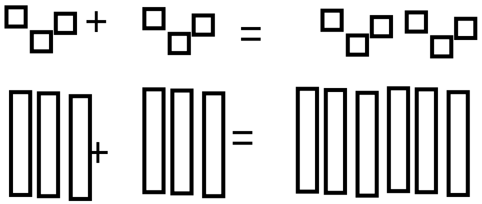
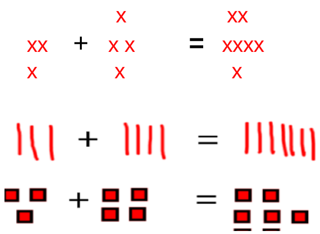
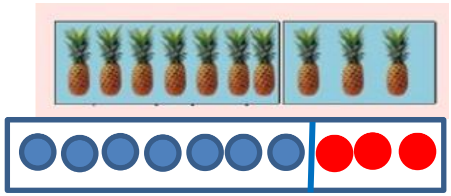
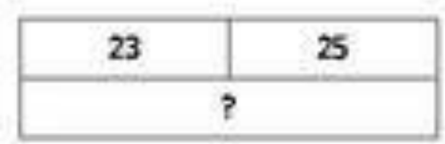
amended over time.

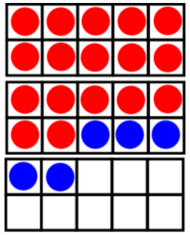
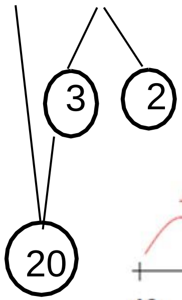
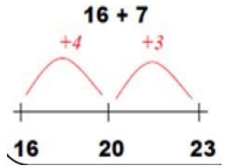
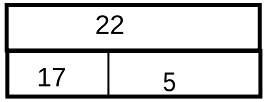
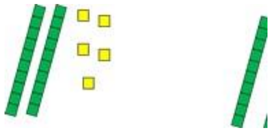
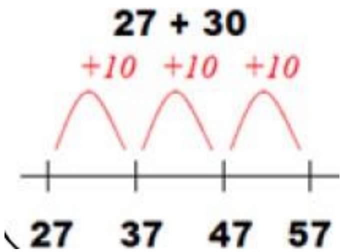
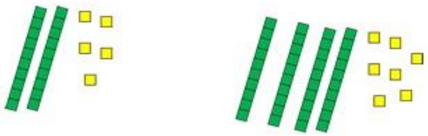
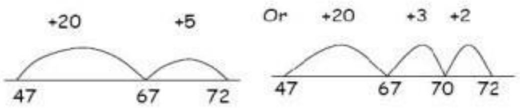
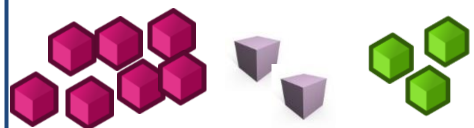
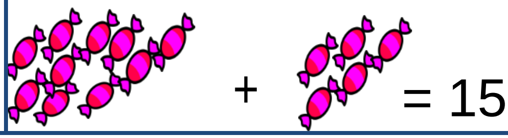
Y1 ADDITION +

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

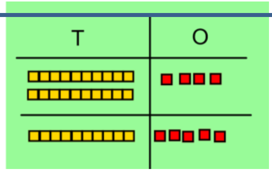
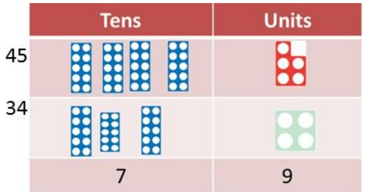
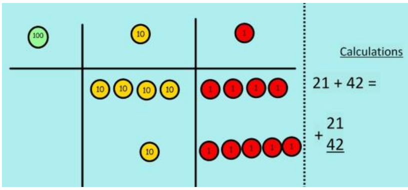
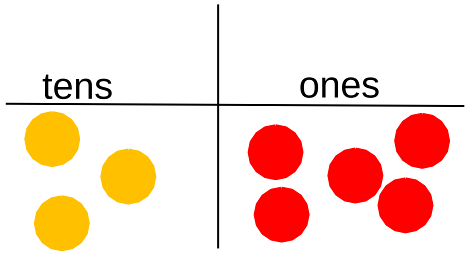
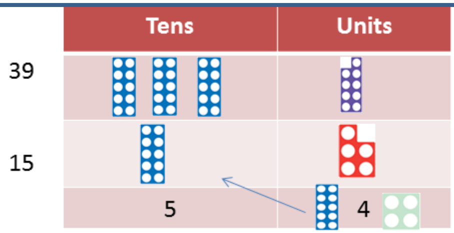
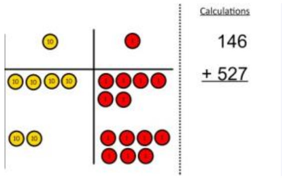
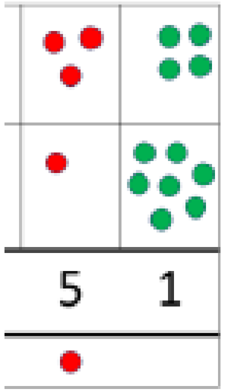
Y2

ADDITION +

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

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

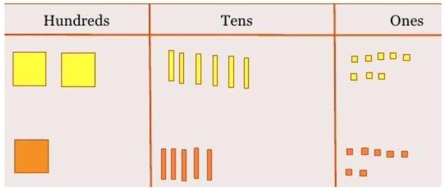
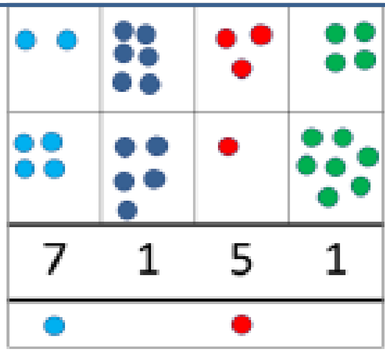
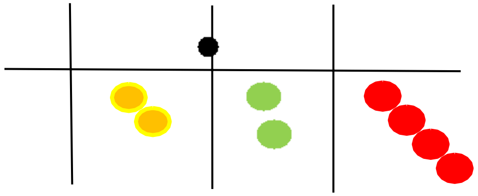
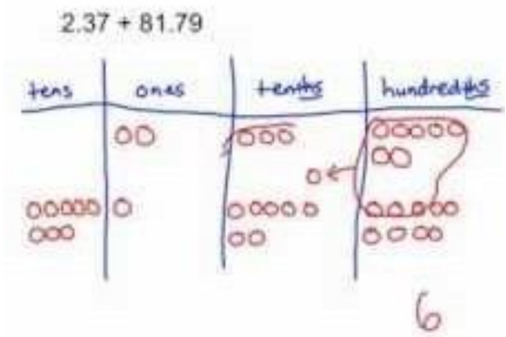
Y2 ADDITION +

Objective & Strategy	Concrete	Pictorial	Abstract
Column Addition—no regrouping Add two or three 2 or 3-digit numbers.	 Model using Dienes or numicon Add together the ones first, then the tens.   Move to using place value counters	Children move to drawing the counters using a tens and ones frame or hundreds tens and ones frame. 	$\begin{array}{r} 223 \\ +\ 114 \\ \hline 337 \\ \hline \end{array}$ Add the ones first, then the tens, then the hundreds.
Column Addition with regrouping.	 Exchange ten ones for a ten, or ten tens for one hundred. Model using Dienes, Numicon and pv counters. 	 Children can draw a representation of the grid to further support their understanding, exchanging the ten **underneath** the line Bar models, with missing numbers and related fact families	$\begin{array}{ccc} 20 & + & 5 \\ 40 & + & 8 \\ \hline 60 & + & 13 \end{array} = 73$ Start by partitioning the numbers before formal column to show the exchange (s). $\begin{array}{r} 536 \\ +\ 85 \\ \hline 621 \\ \hline 1\ 1 \end{array}$

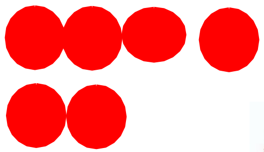
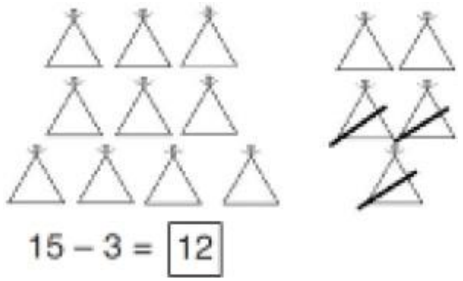
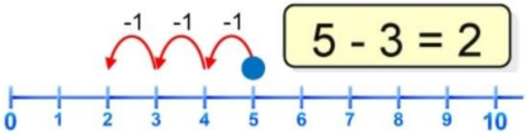
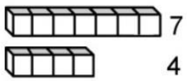
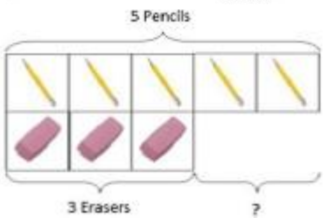
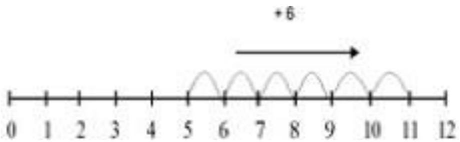
Y3

ADDITION +

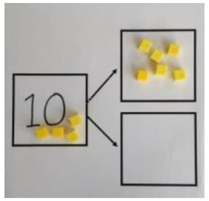
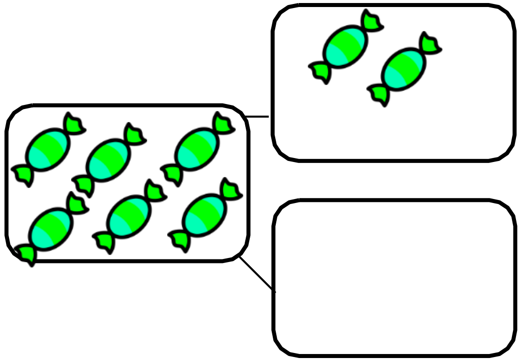
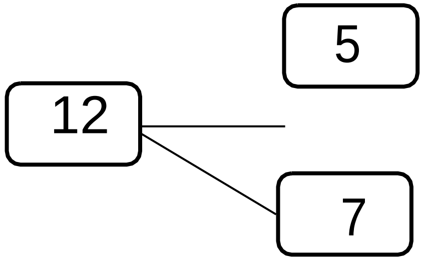
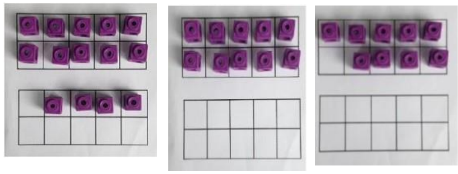
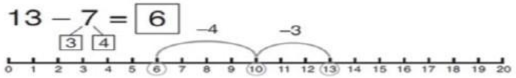
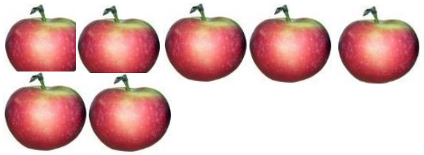
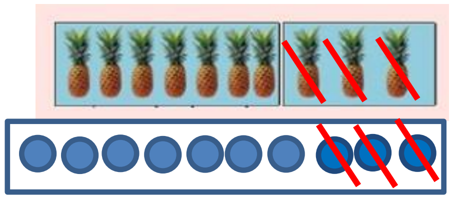
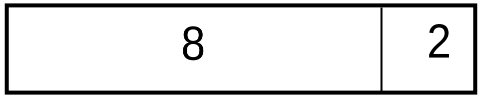
Y4-6 ADDITION +

Objective & Strategy	Concrete	Pictorial	Abstract
Y4—add numbers with up to 4 digits	Children continue to use Dienes and pv counters to add, exchanging ten ones for a ten and ten tens for a hundred and ten hundreds for a thousand.  	 Draw representations using pv grid.	Continue from previous work including exchanges from hundreds into thousands
Y5—add numbers with more than 4 digits. Add decimals with 2 decimal places.		 	72.8 + 54.6 127.4 1 1 £ 2 3 · 5 9 + £ 7 · 5 5 £ 3 1 · 1 4 1 1
Y6—add several numbers of increasing complexity Including decimals with different numbers of decimal points.	As Y5	As Y5	8 1,0 5 9 3,6 6 8 1 5,3 0 1 + 2 0,5 5 1 1 2 0,5 7 9 1 1 1 1 Insert zeros for place holders. 2 3 · 3 6 1 9 · 0 8 0 5 9 · 7 7 0 + 1 · 3 0 0 9 3 · 5 1 1 2 1 2

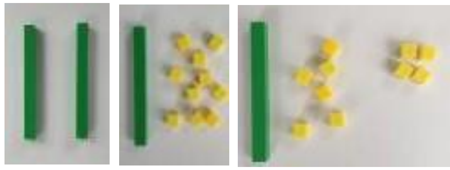
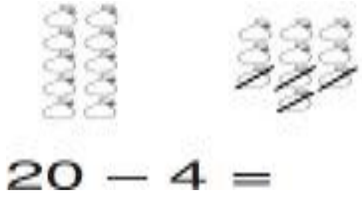
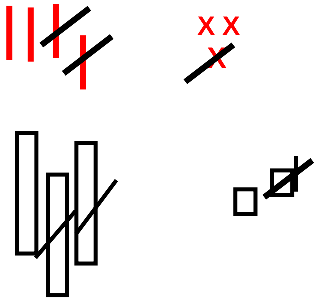
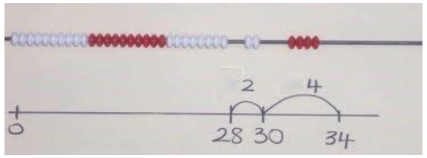
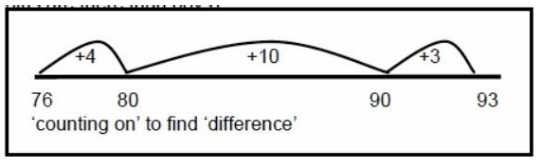
Y1 SUBTRACTION -

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

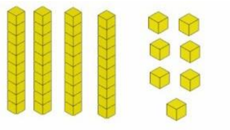
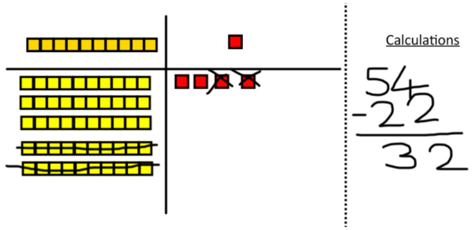
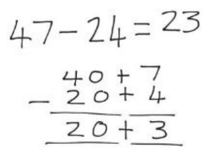
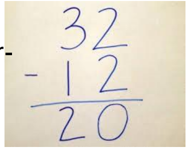
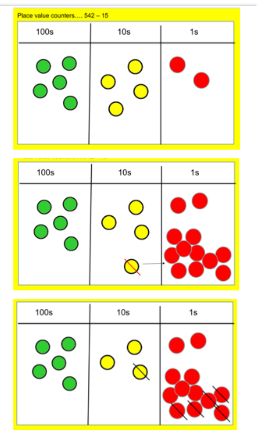
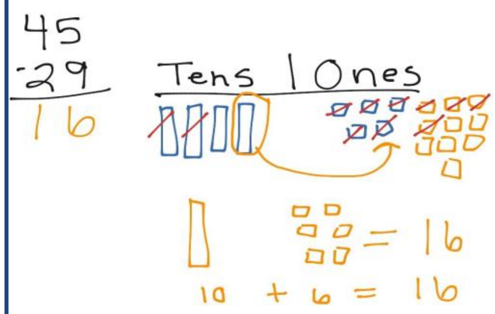
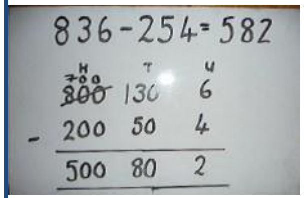
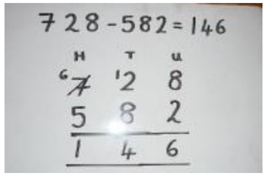
Y1 SUBTRACTION -

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

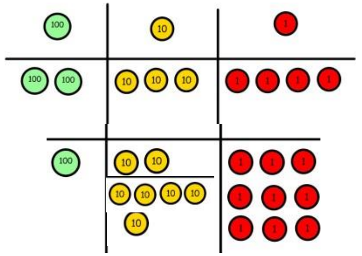
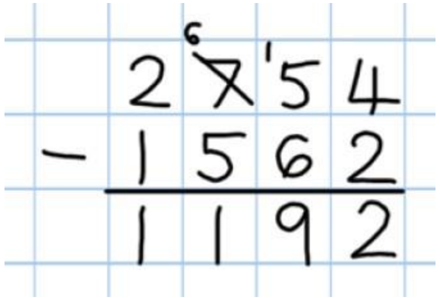
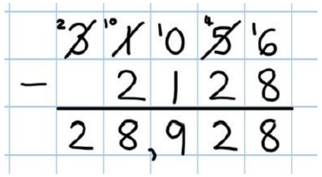
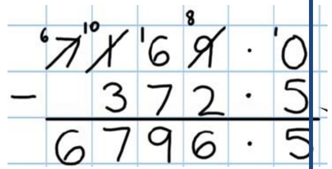
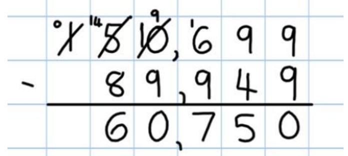
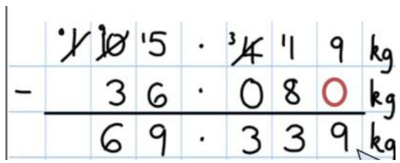
Y2 SUBTRACTION -

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

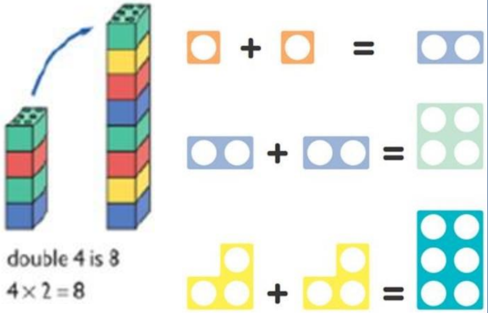
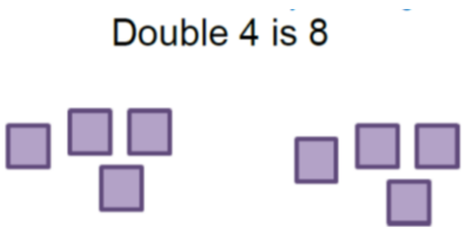
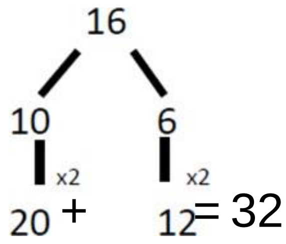
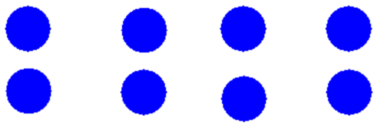
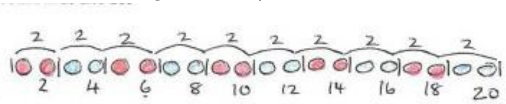
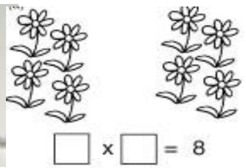
Y3 SUBTRACTION -

Obective & Strategy	Concrete	Pictorial	Abstract
Column subtraction without regrouping	 47—32 Use base 10, pv counters or Numicon to model, physically remove first the ones, then the tens – move to 3-digit.	 Draw representations to support under-standing	 Intermediate step may be needed to lead to clear subtraction under-standing. 
Column subtraction with regrouping	 542- 15 Exchange 1 ten for 10 ones subtract ones then tens Begin with base 10 or Numicon. Move to pv counters, modelling the exchange of a ten into ten ones (or a hundred into ten tens).	 Children may draw base ten. pv counters and cross off. Missing number calculations, using bar models to identify operation and rekated fact families.	 Begin by parti-tioning into pv columns Then move to formal method. 

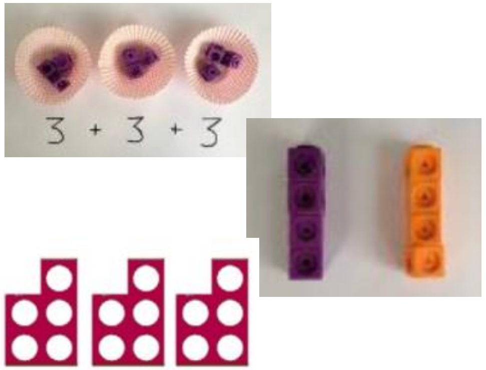
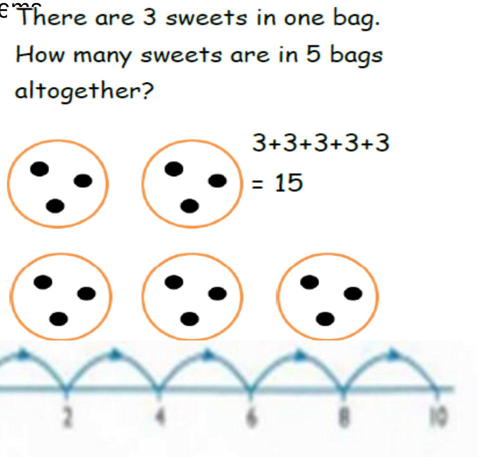
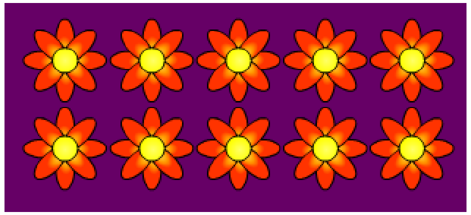
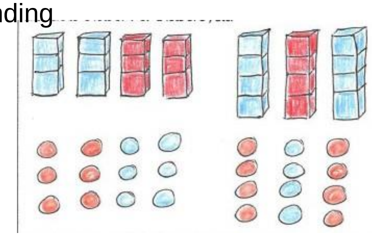
Y4-6 SUBTRACTION -

Objective & Strategy	Concrete	Pictorial	Abstract
Subtracting tens and ones Year 4 subtract with up to 4 digits. *Introduce decimal subtraction*	234 - 179  Model process of exchange using Numicon, base ten and then move to PV counters.	Children to draw pv counters and show their exchange—see Y3	 Use the phrase 'take and make' for exchange
Year 5- Subtract with at least 4 digits *Subtract with decimal values, including mixtures of integers and decimals and aligning the decimal*	As Year 4	Children to draw pv counters and show their exchange—see Y3 Using bar models to represent more complex missing number calculations.	 Use zeros for place-holders. 
Year 6—Subtract with increasingly large and more complex numbers and decimal values.			 

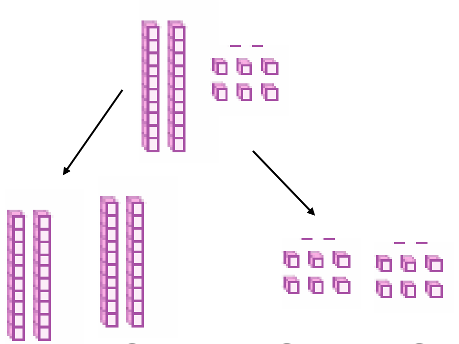
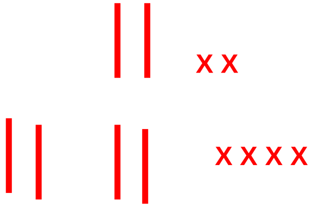
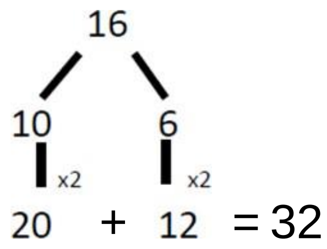
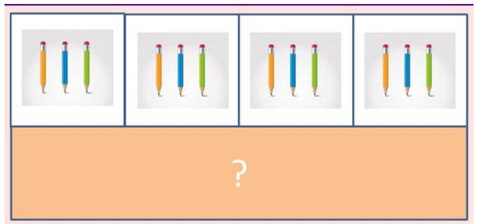
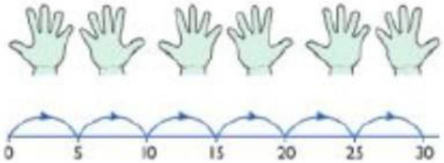
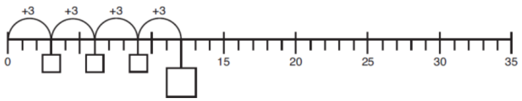
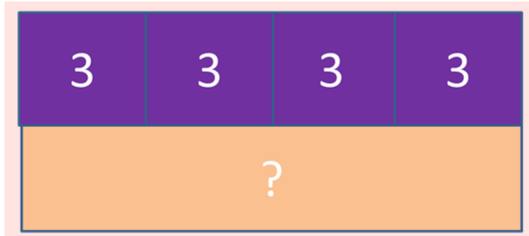
Y1 MULTIPLICATION ×

Objective & Strategy	Concrete	Pictorial	Abstract
Doubling	Use practical activities using manip- ultives including cubes and Numicon to demonstrate doubling 	Draw pictures to show how to double numbers 	Partition a number and then double each part before recombining it back together. 
Counting in multiples	Count the groups as children skip count. Children may use their fin- gers as they are skip counting.  	 Children make representations to show counting in multiples. 	Count in multiples of a number aloud. Write sequences with multiples of num- bers. 2, 4, 6, 8, 10 5, 10, 15, 20, 25 , 30
Making equal groups and counting the total (multiplicand x multiplier Eg. 2x3 meaning 3 lots of 2, or 2, 3times)	  Use manipulatives to create equal groups.	Draw  to show 2 x 3 = 6 Draw and make representations	2 x 4 = 8 (multiplicand x multiplier Eg. 2x4 meaning 4 lots of 2, or 2, 4times)

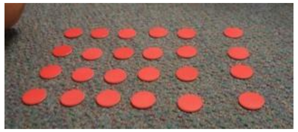
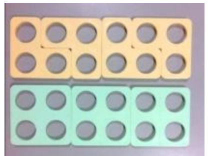
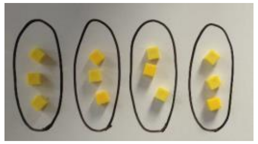
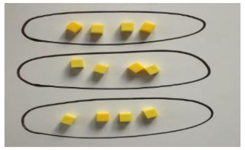
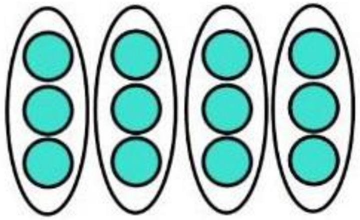
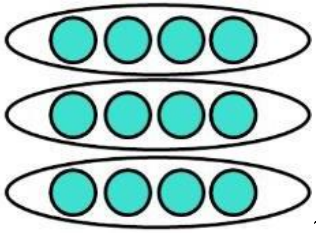
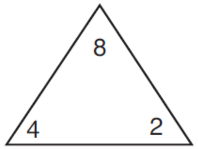
Y1 MULTIPLICATION ×

Objective & Strategy	Concrete	Pictorial	Abstract
Repeated addition	 Use different objects to add equal groups	Use pictorial including number lines to solve problems 	Write addition sentences to describe objects and pictures. 
Understanding arrays	Use objects laid out in arrays to find the answers to 2 lots of 5, 3 lots of 2 etc. 	Draw representations of arrays to show understanding 	Multiplication number sentences: 3 x 2 = 6 2 x 5 = 10

Y2 MULTIPLICATION ×

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

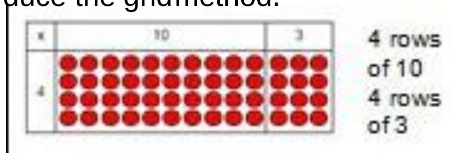
Y2 MULTIPLICATION ×

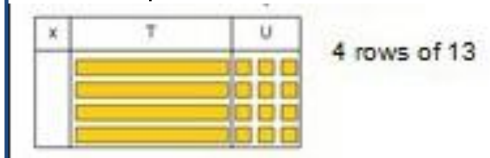
Objective & Strategy	Concrete	Pictorial	Abstract
Multiplication is commutative 5x3 = 15 3x5 = 15	Create arrays using counters and cubes and Numicon.    Pupils should understand that an array can represent different equations and that, as multiplication is commutative, the order of the multiplication does not affect the answer.  	Use representations of arrays to show different calculations and explore commutativity.  12÷3  12÷4	$12 = 3 \times 4$ $12 = 4 \times 3$ Use an array to write multiplication sentences and reinforce repeated addition.  5 + 5 + 5 = 15 3 + 3 + 3 + 3 + 3 = 15 5 x 3 = 15 3 x 5 = 15
Using the Inverse *This should be taught alongside division, so pupils learn how they work alongside each other.*		 $\square \times \square = \square$ $\square \times \square = \square$ $\square \div \square = \square$ $\square \div \square = \square$	2 x 4 = 8 4 x 2 = 8 8 ÷ 2 = 4 8 ÷ 4 = 2 8 = 2 x 4 8 = 4 x 2 2 = 8 ÷ 4 4 = 8÷ 2 Show all 8 related fact family sentences.

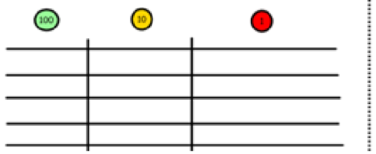
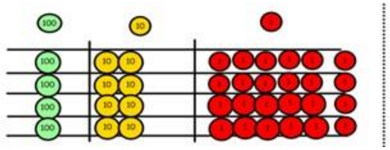
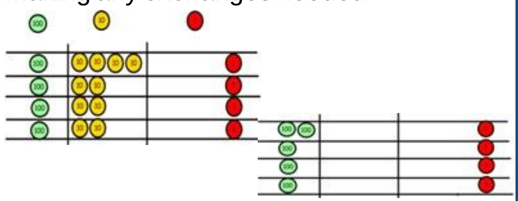
Y3 MULTIPLICATION ×

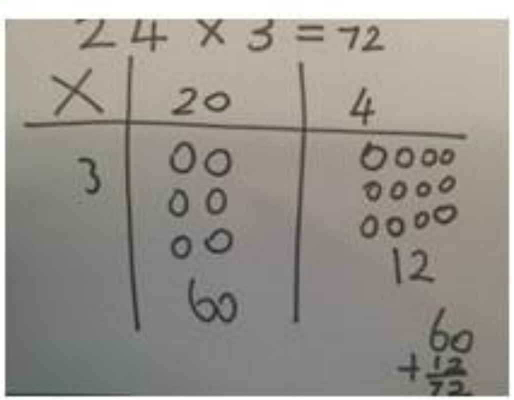
<table>
<tr><th>Objective & Strategy</th><th>Concrete</th><th>Pictorial</th><th>Abstract</th></tr>
<tr>
<td>Grid method

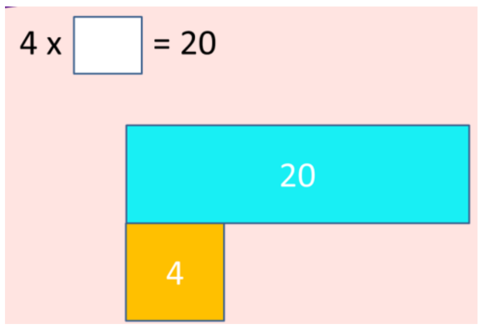
2 digit x 1 digit

Then move towards 3 digit x 1 digit</td>
<td>Show the links with arrays to first introduce the grid method.


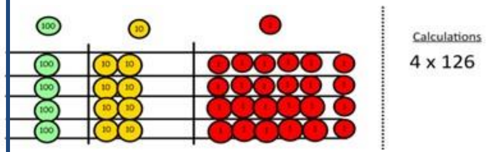
Move onto base ten to move towards a more compact method.


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

126x4
Fill each row with 126

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

Then you have your answer.</td>
<td>Children can represent their work with place value counters in a way that they understand.

They can draw the counters using colours to show different amounts or just use the circles in the different columns to show their thinking :


Bar model are used to explore missing numbers

</td>
<td>Start with multiplying by one digit numbers and showing the clear addition alongside the grid.
<table>
<tr><th>×</th><th>30</th><th>5</th></tr>
<tr><td>7</td><td>210</td><td>35</td></tr>
</table>
210 + 35 = 245</td>
</tr>
</table>

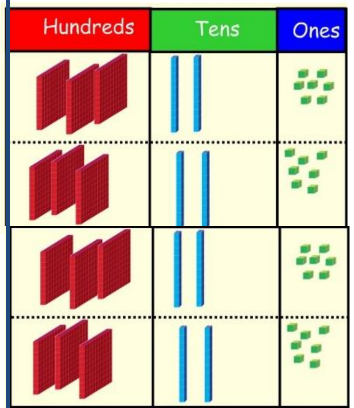
Y4 MULTIPLICATION ×

Objective & Strategy	Concrete	Pictorial	Abstract
Grid method recap from year 3 for 2 digits x 1 digit Consolidation of 3 digit numbers by 1 digit.	As above  Starting with the ones – total amounts, incorporating addition of exchanges where necessary	Children can represent their work with place value counters in a way that they understand. They can draw the counters using colours to show different amounts or just use the circles in the different columns to show their thinking as shown above (Y3)	Recap of multiplying 2/3 digit by 1 digit then moving forward, multiply by a 2 digit number showing the different rows within the grid method. .

	10	8
10	100	80
3	30	24

Column multiplication

Concrete: Children can continueto be supported by place value counters at the stage of multiplication. This initially done where there is no regrouping. 327 x 4



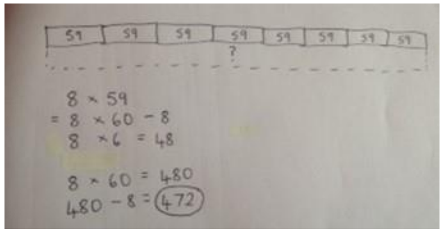
It is important at this stage that they always multiply the ones first.

The corresponding long multiplication is modelled alongside

Pictorial:

x	300	20	7
4	1200	80	28

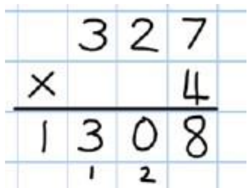
The grid method my be used to show how this relates to a formal written method.



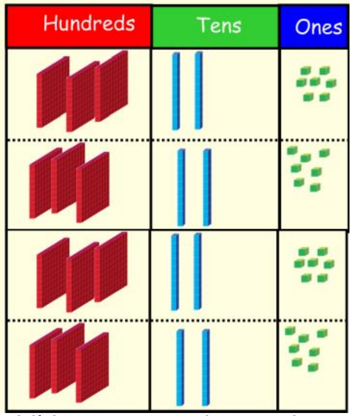
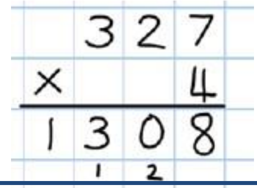
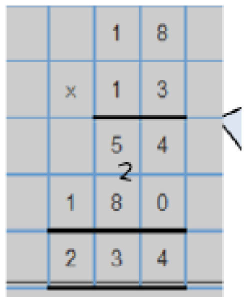
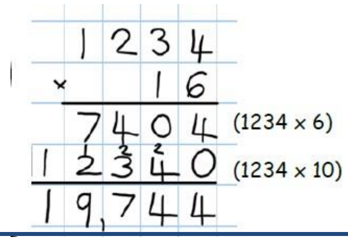
Bar modelling and number lines can support learners when solving problems with multiplication alongside the formal written methods.

Abstract:

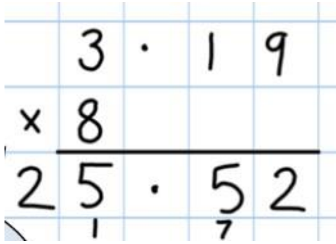
```
  327
x   4
-----
   28
   80
 1200
-----
 1308
```

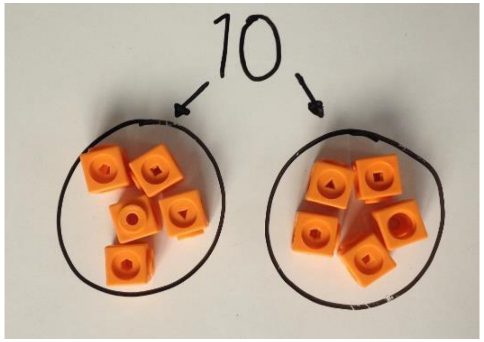
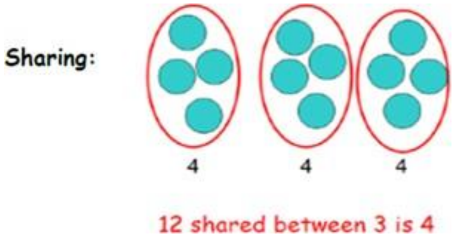


This may lead to a compact method.

Objective & Strategy	Concrete	Pictorial	Abstract
Column Multiplication for 3 and 4 digits x 1 digit.	 It is important at this stage that they always multiply the ones first. Children can continue to be supported by place value counters at the stage of multiplication. This initially done where there is no regrouping. 321 x 2 = 642, then exchanging.	As previously	327 x 4 28 80 1200 1308  This will lead to a compact method.
Column multiplication	Manipulatives may still be used with the corresponding long multiplication modelled alongside.	As previously – continuing to use bar modelling to support prob lem solving	 18 x 3 on the first row (8 x 3 =24, exchanging the 2 for 20, then 1 x 3) 18 x 10 on the 2nd row. Show multiplying by 10 by putting zero as a place holder in units first 

Y5-6 MULTIPLICATION ×

Objective & Strategy	Concrete	Pictorial	Abstract
Multiplying numbers up to 2 decimal places by a single digit			Remind children that the single digit belongs in the ones column. Line up the decimal points in the question and the answer.  Add 0s as place holders

Objective & Strategy	Concrete	Pictorial	Abstract
Division as sharing	   I have 10 cubes. Can you share them equally between 2.	Children use pictures or shapes to share quantities.  8 shared between 2 is 4  	12 shared between 3 is 4

Y1

DIVISION

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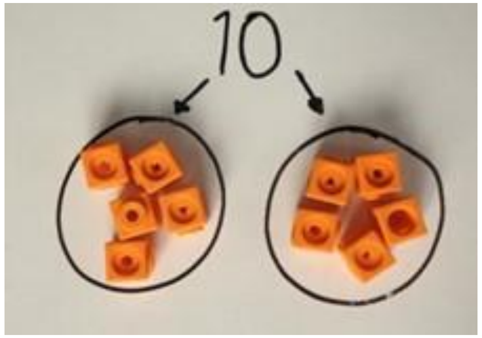
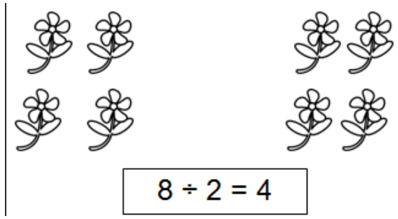
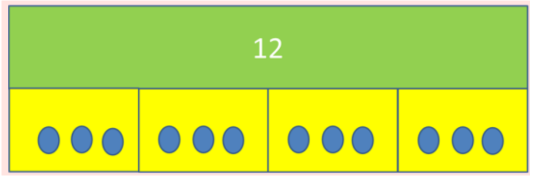
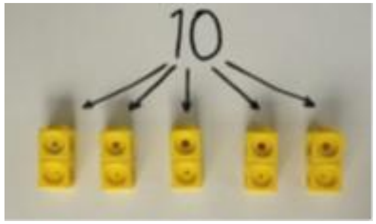
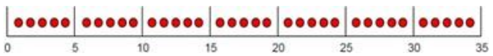
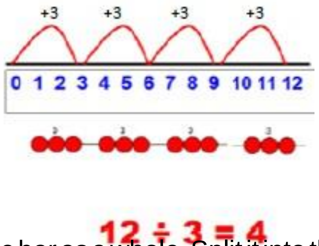
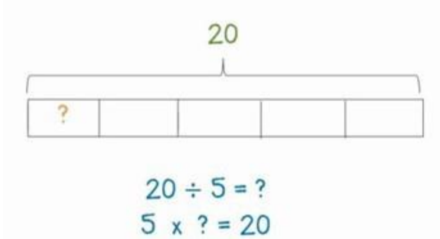
Objective & Strategy	Concrete	Pictorial	Abstract
Division as sharing	 I have 10 cubes, can you share them equally in 2 groups?	Children use pictures or shapes to share quantities.  Children use bar modelling to show and support understanding.  $12 \div 4 = 3$	$12 \div 3 = 4$
Division as grouping	Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding.  	Use number lines for grouping  Think of the bar as a whole. Split it into the number of groups you are dividing by and work out how many would be within each group. 	$28 \div 7 = 4$ Divide 28 into 7 groups. How many are in each group?

Y2

DIVISION

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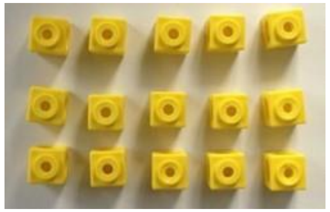
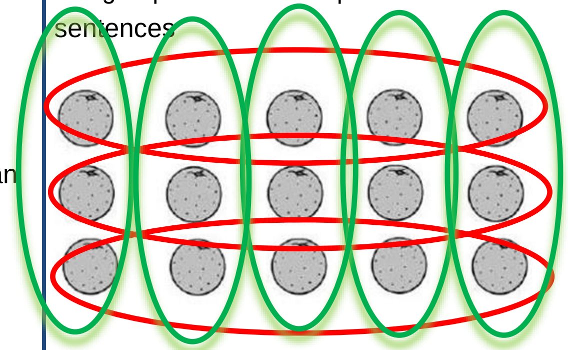
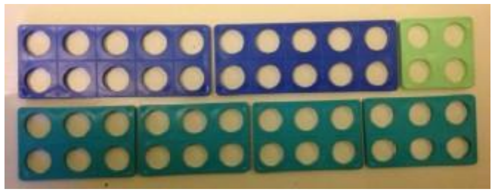
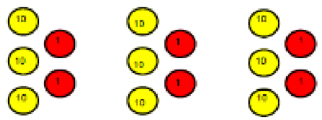
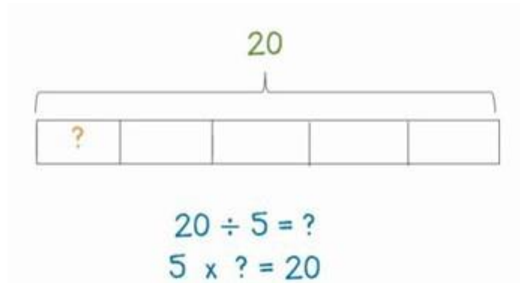
Objective & Strategy	Concrete	Pictorial	Abstract
Division with arrays (as grouping)	 Link division to multiplication by creating an array and thinking about the number sentences that can be created. Eg 15 ÷ 5=3 5 x 3 = 15 15 ÷3 = 5 3 x 5 = 15	Draw an array and use lines to split the array into groups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

Y3

DIVISION

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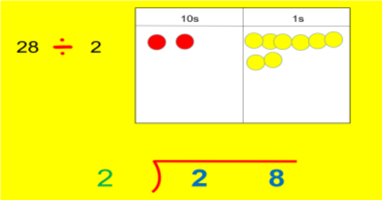
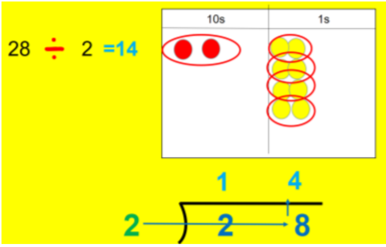
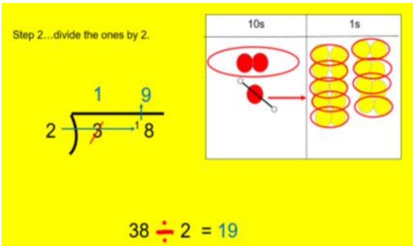
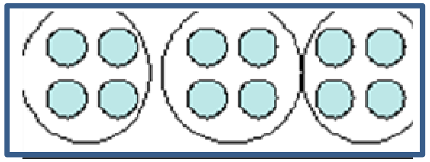
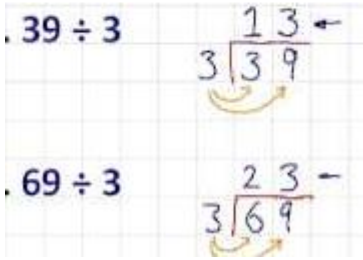
Objective & Strategy	Concrete	Pictorial	Abstract
Division as grouping –moving to short division 2 digit divided by 1 digit (moving to 3 digit	Using pv counters . 28÷2  Start with the tens : how many groups of 2 counters, then the ones. No remainders in tens or 1s.  Moving to more complex where an exchange is required: eg 38÷2  The remaining 1 tenis exchanged for ten 1s then the 1s are grouped into 3s. Use place value counters to divide moving to using the formal method of short division	Children can use drawn diagrams to help them divide numbers:  Encourage them to move towards counting in multiples or using known x and ÷ facts	2digit divided by 1 digit, no remainder  Then move onto 2 digit divided by 1 digit where there is an exchange from tens to ones $\begin{array}{r} 18 \\ 4\overline{)7^{3}2} \end{array}$

Y3

DIVISION

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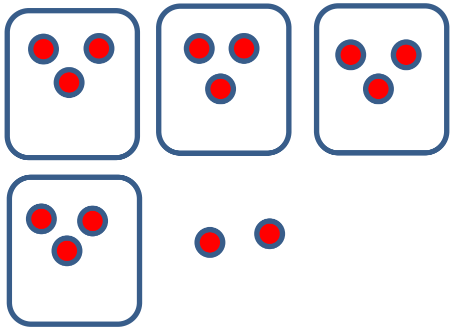
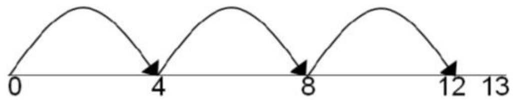
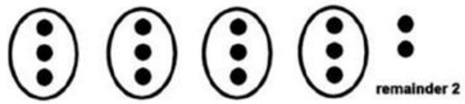
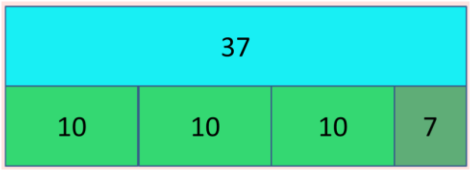
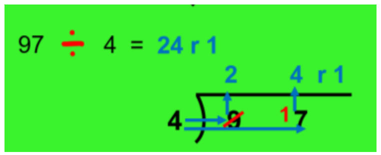
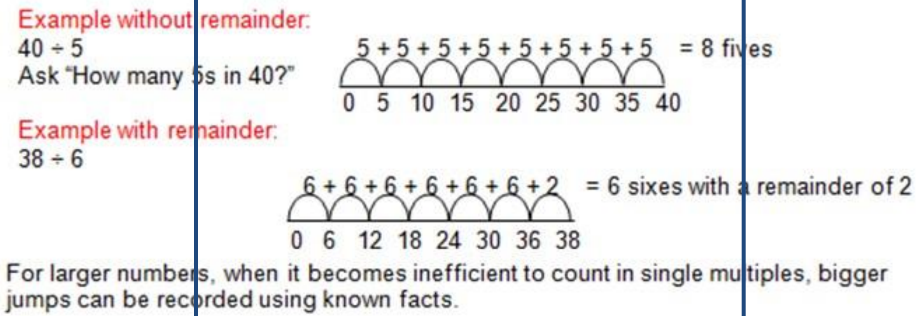
Objective & Strategy	Concrete	Pictorial	Abstract
Division with remainders.	14 ÷ 3 = Divide objects into groups and see how much is left over  Moving to using place value counters alongside short division, exchanging remaining hundreds into the tens and remaining tens into the ones. Remaining ones to be expressed as a remainder	Jump forward in equal jumps on a number line then see how many more you need to jump to find a remainder.  Draw dots and group them to divide an amount and clearly show a remainder.  Use bar models to show division with remainders. 	Complete written divisions and show the remainder using r.  



Y3

DIVISION

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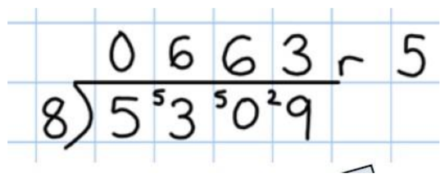
Objective & Strategy	Concrete	Pictorial	Abstract
Divide at least 3 digit numbers by 1 digit. (Y4) Divide numbers up to 4 digits by a 1 digit number and interpreting remainders appropriately for the context (Y5) Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context (Y6) Short Division	As for Y3 Consolidation of short division method, taught in Year 3, using place value counters to divide alongside the formal written method Starting with numbers where there are no exchanges and moving to those with exchanges, then those with exchanges and remainders.	As for Yr3 Students can continue to use drawn diagrams with dots or circles to help them divide numbers into equal groups. They should be encouraged to move towards counting in multiples/ using known tables facts to divide more efficiently.	Begin with divisions that divide equally with no remainder. $\begin{array}{r} 2\;\;1\;\;8 \\ 4\,\overline{)\,8\;\;7\;\;{}^{3}2} \end{array}$ Move onto divisions with a remainder. $\begin{array}{r} 0\;\;8\;\;6\;\;\text{r}\;2 \\ 5\,\overline{)\,4\;\;3\;\;{}^{3}2} \end{array}$ And expressing the remainder as a fraction Eg $\begin{array}{r} 0\;\;8\;\;6\;\;\frac{2}{5} \\ 5\,\overline{)\,4\;\;3\;\;{}^{3}2} \end{array}$ Finally move into decimal places to divide the total accurately $\begin{array}{r} 0\;\;1\;\;4\;.\;6 \\ 35\,\overline{)\,5\;\;1\;\;{}^{16}1\;.\;{}^{21}0} \end{array}$ 

Y4-6

DIVISION

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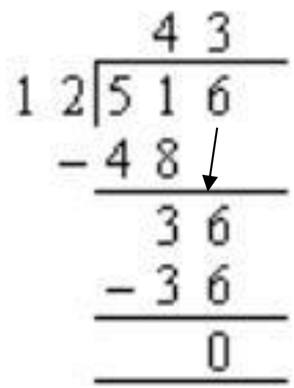
Y6

DIVISION

Objective & Strategy	Long Division
Divide numbers up to 4 digits by a 2-digit whole number using the formal written method of **long division**, and interpret remainders as whole number remainders, fractions, decimals or by rounding, as appropriate for the context	. Moving from examples with no remainders, through examples where remainders in the ones to examples where remainders in any of the place values, using known multiples to scaffold:

eg, 516 ÷ 12



Multiples to help:
12 x 1 = 12
12 x 2 = 24
12 x 3 = 36
12 x 4 = 48
12 x 5 = 60

|
|
V

51 divided by 12 is 4 reminder 3 -
12 x 4 is 48 ,
Subtract 48 from 51
3 (tens)remaining

Then move the 6 ones down to join the remaining 3 tens
So now 36 divided by 12