Sunny Bank Primary School

Calculation Policy

Content

Introduction

At Sunny Bank Primary we believe that children should be introduced to the processes of calculation through practical, oral, and mental activities. As children begin to understand the underlying ideas, they develop ways of recording to support their thinking and calculation methods, use methods that apply to special cases, and learn to interpret and use the signs and symbols involved. Choosing the appropriate strategy, recording in mathematics and in calculation is an important tool both for furthering the understanding of ideas and for communicating those ideas to others. A useful written method is one that helps children carry out a calculation and can be understood by others. Written methods are complementary to mental methods and should not be separate from them.

The aim is that children use mental methods when appropriate, but for calculations that they cannot do in their heads they use an efficient written method accurately and with confidence. It is important children acquire secure mental methods of calculation and one efficient written method of calculation for addition, subtraction, multiplication, and division which they know they can rely on when mental methods are not appropriate. This document identifies progression in calculation strategies rather than specifying which method should be taught in a particular year group.

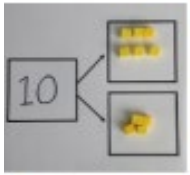
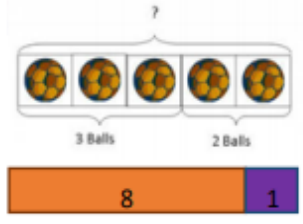
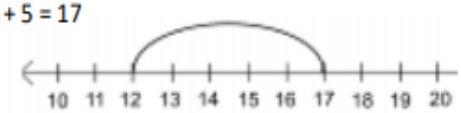
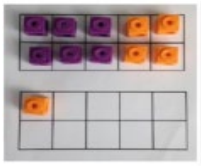
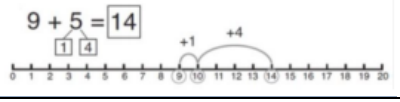
Children should not be made to go onto the next stage if:

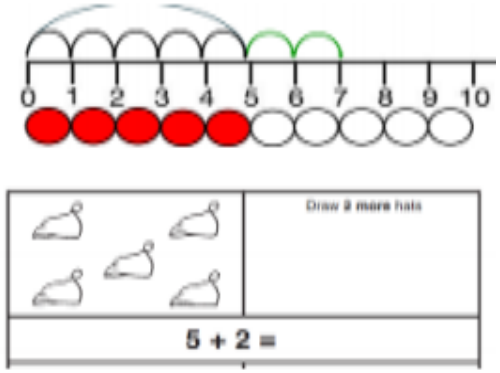
1) they are not ready.

2) they are not confident

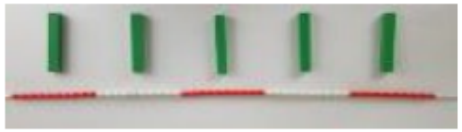
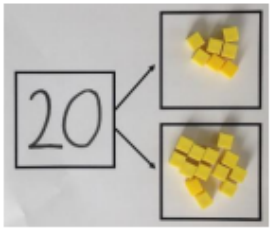
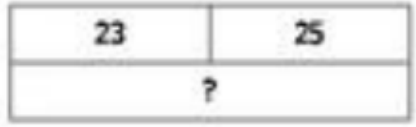
By the end of Year 6, children should be able to choose the most appropriate approach to solve a problem: making a choice between using jottings (an extended written method), an efficient written method or a mental method. This policy contains the key pencil and paper procedures that will be taught within our school alongside practical resources. It has been written to ensure consistency and progression throughout the school and reflects a whole school agreement.

Year 1 Addition Key language: sum, total, parts and wholes, plus, add, altogether, more, 'is equal to', is the same as.

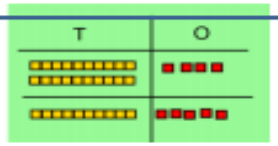
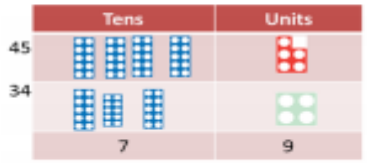
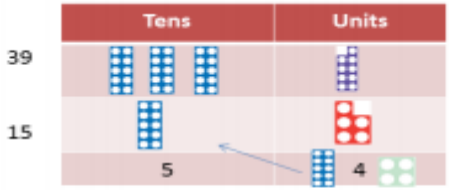
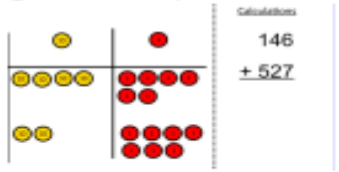
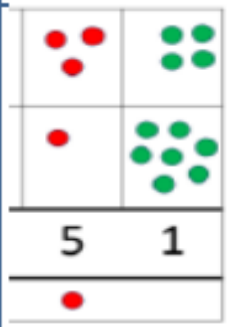
Objective and strategy	Concrete	Pictorial	Abstract
Combining two parts to make a whole: part-whole model	   Use part part whole model. Use cubes to add two numbers together as a group or in a bar. 	   Use pictures to add two numbers together as a group or in a bar.	4 + 3 = 7  10= 6 + 4 Use the part-part whole diagram as shown above to move into the abstract.
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 = 1  Start with the bigger number and use the smaller number to make 10. Use ten frames.	 3 + 9 = 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.'* *'2 more than 5 is 7.'* *'8 is 3 more than 5.'*

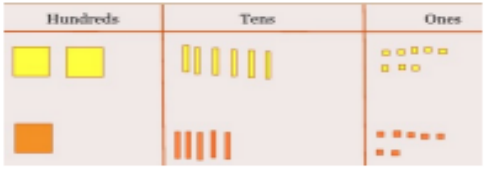
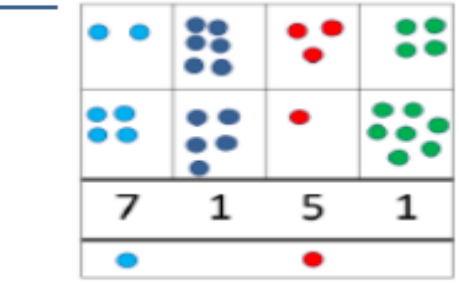
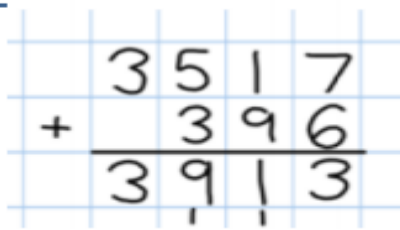
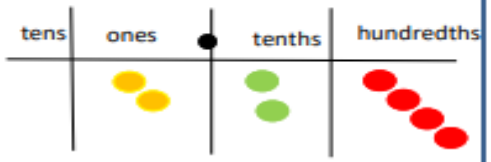
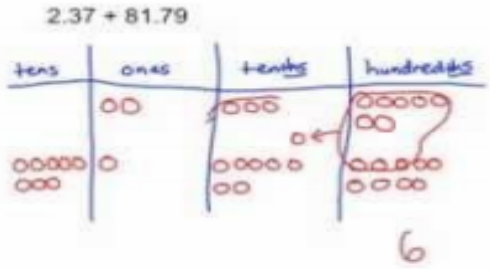
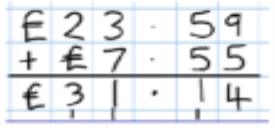
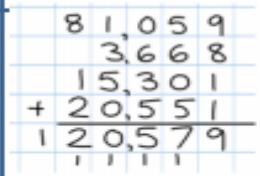
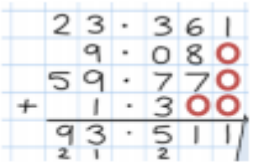
Year 2 Addition Key language: sum, total, parts and wholes, plus, add, altogether, more, 'is equal to', is the same as.

Objective and strategy	Concrete	Pictorial	Abstract
Adding multiples of ten	50= 30 = 20  Model using dienes and bead strings	 3 tens + 5 tens = _____ tens 30 + 50 = _____ Use representations for base ten.	20 + 30 = 50 70 = 50 + 20 40 + □ = 60
Use known number facts Part part whole	 Children explore ways of making numbers within 20	20 □ + □ = 20 20 – □ = □ □ + □ = 20 20 – □ = □	□ + 1 = 16 16 – 1 = □ 1 + □ = 16 16 – □ = 1
Using known facts	□□ + □□ = □□ □□ □□□ + □□□ = □□□□□	∴ + ∴ = ∴ ||| + |||| = ||||||| ■■ + ■■ = ■■■■	3 + 4 = 7 *leads to* 30 + 40 = 70 *leads to* 300 + 400 = 700
Bar model	 3 + 4 = 7	 7 + 3 = 10	 23 + 25 = 48

Year 3 Addition Key Vocabulary: sum, total, parts and wholes, plus, add, altogether, more, 'is equal to', is the same as.

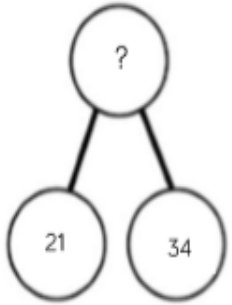
Objective & Strategy	Concrete	Pictorial	Abstract
Column Addition—no regrouping (friendly numbers) Add two or three 2 or 3-digit numbers.	 Model using Dienes or numicon Add together the ones first, then the tens.   Move to using place value counters	Children move to drawing the counters using a tens and one frame. 	2 2 3 + 1 1 4 3 3 7 Add the ones first, then the tens, then the hundreds.
Column Addition with regrouping.	 Exchange ten ones for a ten. Model using numicon and pv counters. 	 Children can draw a representation of the grid to further support their understanding, carrying the ten **underneath** the line	20 + 5 40 + 8 60 + 13 = 73 Start by partitioning the numbers before formal column to show the exchange. 536 + 85 621 1 1

Year 4 -6 Addition Key language: sum, total, parts and wholes, plus, add, altogether, more, 'is equal to', is the same as.

Objective & Strategy	Concrete	Pictorial	Abstract
Y4—add numbers with up to 4 digits	~~Children continue to use dienes or pv~~ counters to add, exchanging ten ones for a ten and ten tens for a hundred and ten hundreds for a thousand. 	 Draw representations using pv grid.	 Continue from previous work to carry hundreds as well as tens. Relate to money and measures.
Y5—add numbers with more than 4 digits. Add decimals with 2 decimal places, including money.	As year 4  Introduce decimal place value counters and model exchange for addition.		72.8 + 54.6 127.4 1 1 
Y6—add several numbers of increasing complexity Including adding money, measure and decimals with different numbers of decimal points.	As Y5	As Y5	 Insert zeros for place holders. 

Conceptual variations – Addition Key language: sum, total, parts and wholes, plus, add, altogether, more, 'is equal to', is the same as.

Conceptual variation; different ways to ask children to solve 21 + 34



?	
21	34

Word problems:
In year 3, there are 21 children and in year 4, there are 34 children.
How many children in total?

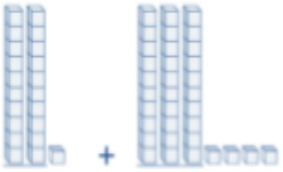
21 + 34 = 55. Prove it

21
+34
___

21 + 34 =

☐ = 21 + 34

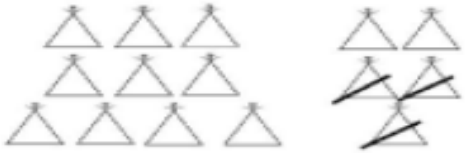
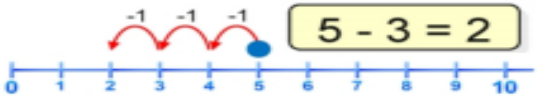
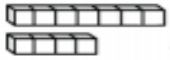
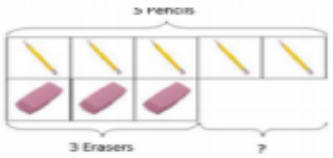
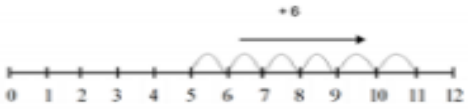
Calculate the sum of twenty-one and thirty-four.



Missing digit problems:

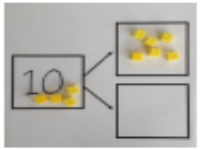
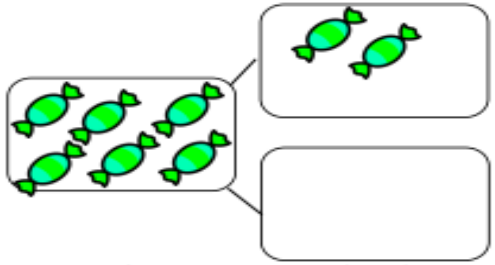
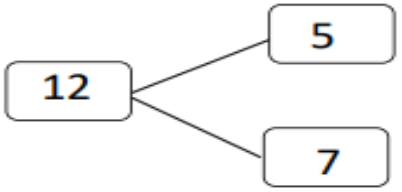
10s	1s
10 10	1
10 10 10	?
?	5

Year 1 Subtraction Key language; Take away, less than, the difference, minus, fewer, decrease

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	 15 – 3 = 12 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 has12 sweets and her sister has 5. How many more does Hannah have than her sister.?

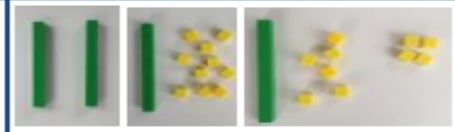
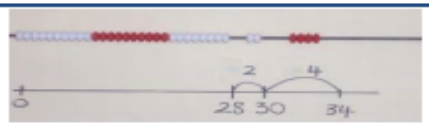
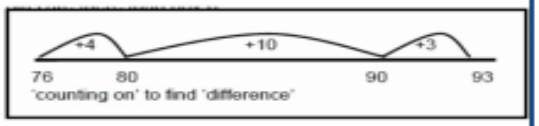
Year 1 Subtraction

Key language; Take away, less than, the difference, minus, fewer, decrease

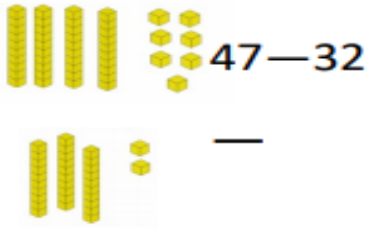
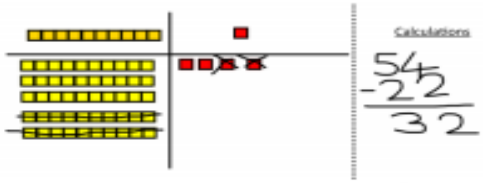
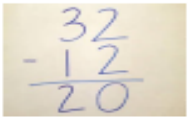
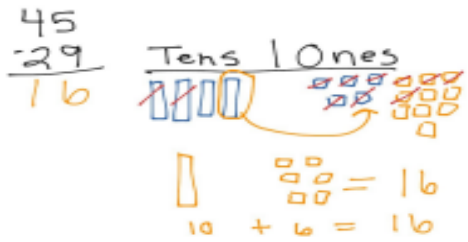
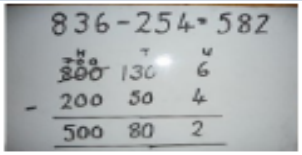
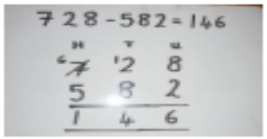
Objective & Strategy	Concrete	Pictorial	Abstract
Represent and use number bonds and related subtraction facts within 20 Part Part Whole model	 Link to addition. Use PPW model to model the inverse. If 10 is the whole and 6 is one of the arts, what s the other part? 10—6 = 4	 Use pictorial representations to show the part.	Move to using numbers within the part whole model. 
Make 10	14—9  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 = 8 + 2 10 = 2 + 8 10—2 = 8 10—8 = 2

Year 2 Subtraction

Key language; Take away, less than, the difference, minus, fewer, decrease

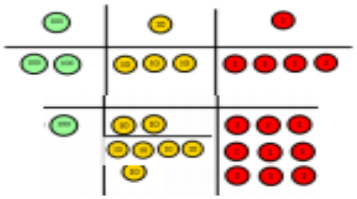
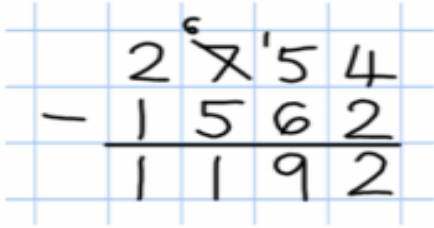
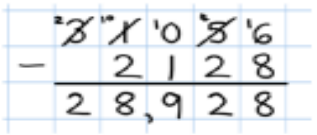
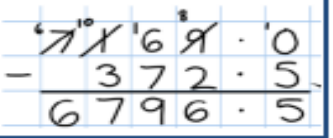
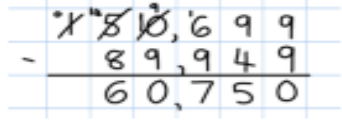
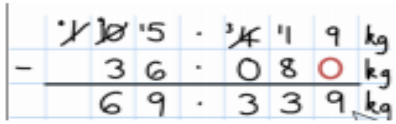
Objective & Strategy	Concrete	Pictorial	Abstract
Regroup a ten into ten ones	 Use a PV chart to show how to change a ten into ten ones, use the term 'take and make'	 20 — 4 =	20—4 = 16
Partitioning to subtract without re-grouping. *'Friendly numbers'*	34—13 = 21   Use Dienes to show how to partition the number when subtracting without regrouping. 	Children draw representations of Dienes and cross off.  43—21 = 22	43—21 = 22
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

Year 3 Subtraction Key language; Take away, less than, the difference, minus, fewer, decrease

Objective & Strategy	Concrete	Pictorial	Abstract
Column subtraction without regrouping (friendly numbers)	 Use base 10 or Numicon to model	 Darw representations to support understanding	$47-24=23$ $40+7$ $-\ 20+4$ $20+3$ Intermediate step may be needed to lead to clear subtraction understanding. 
Column subtraction with regrouping	 Begin with base 10 or Numicon. Move to pv counters, modelling the exchange of a ten into tten ones. Use the phrase 'take and make' for exchange.	 Children may draw base ten or PV counters and cross off.	 Begin by partitioning into pv columns  Then move to formal method.

Year 4-6 Subtraction

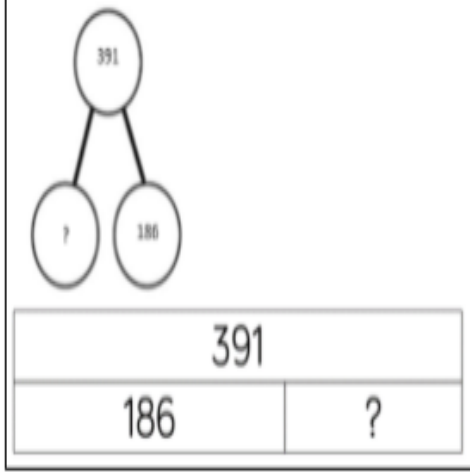
Key language; Take away, less than, the difference, minus, fewer, decrease

Objective & Strategy	Concrete	Pictorial	Abstract
Subtracting tens and ones Year 4 subtract with up to 4 digits. *Introduce decimal subtraction through context of money*	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, including money and measures. *Subtract with decimal values, including mixtures of integers and decimals and aligning the decimal*	As Year 4	Children to draw pv counters and show their exchange—see Y3	 Use zeros for placeholders. 
Year 6—Subtract with increasingly large and more complex numbers and decimal values.			 

Conceptual Variation – Subtraction

Key language; Take away, less than, the difference, minus, fewer, decrease

Conceptual variation; different ways to ask children to solve 391 - 186



Raj spent £391, Timmy spent £186.
How much more did Raj spend?

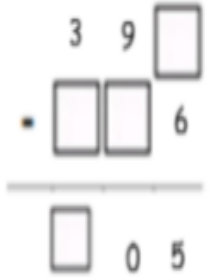
Calculate the difference between 391 and 186.

□ = 391 - 186

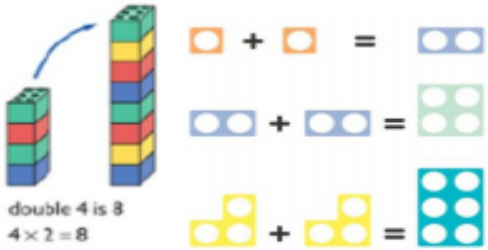
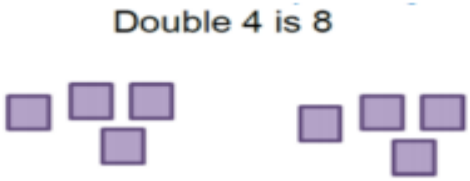
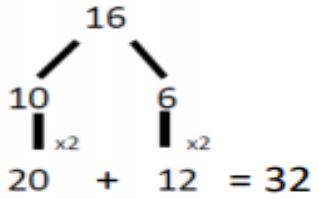
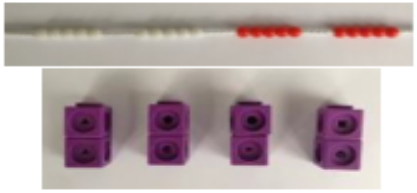
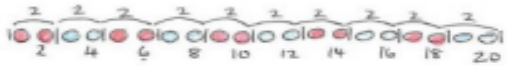
391
-186
—

What is 186 less than 391?

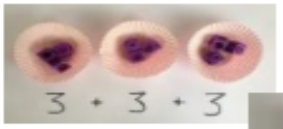
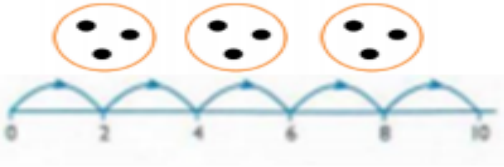
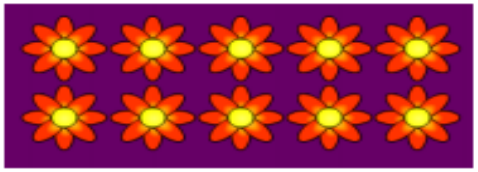
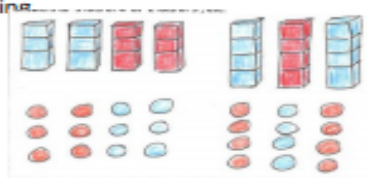
Missing digit calculations



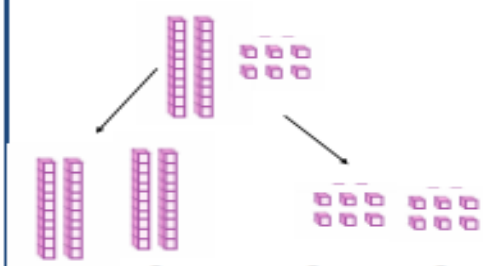
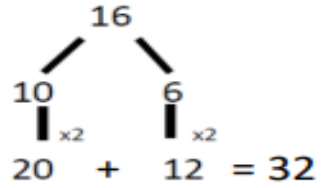
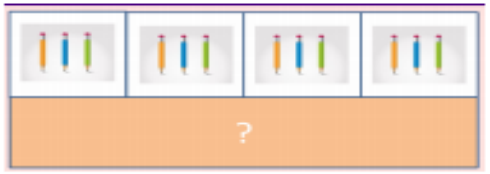
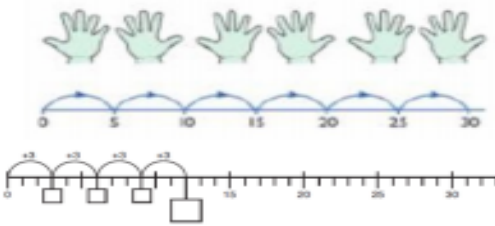
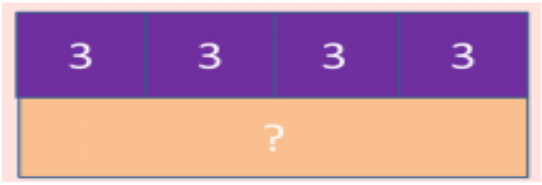
Year 1 Multiplication Key language: double, times, multiplied by, the product of, groups of, lots of, equal g

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 multi-ples	Count the groups as children are skip counting, 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	 Use manipulatives to create equal groups.	Draw  to show 2 x 3 = 6 Draw and make representations	2 x 4 = 8

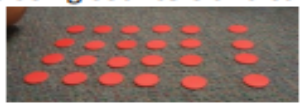
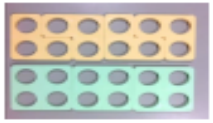
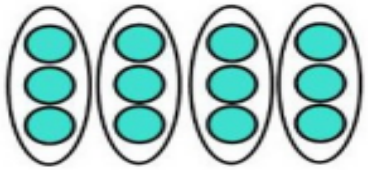
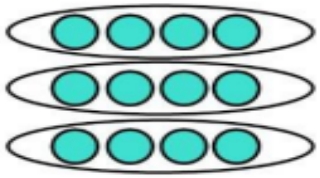
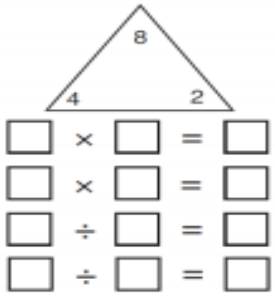
Year 1 Multiplication Key language: double, times, multiplied by, the product of, groups of, lots of, equal groups

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

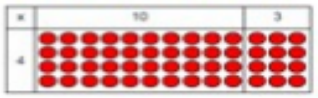
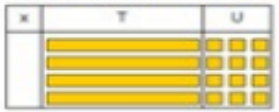
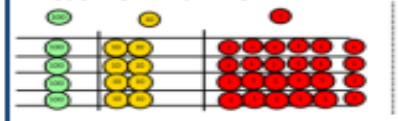
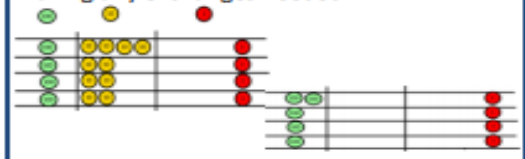
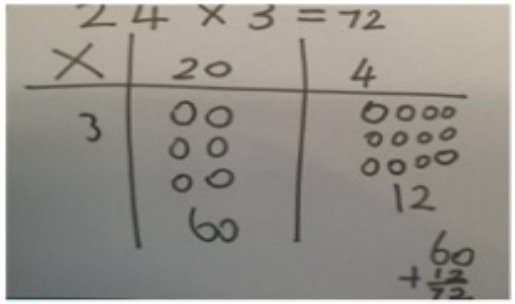
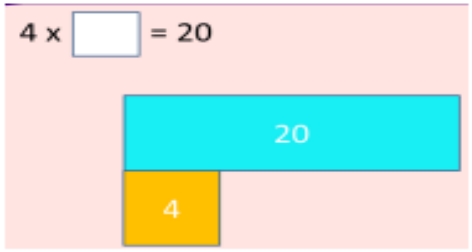
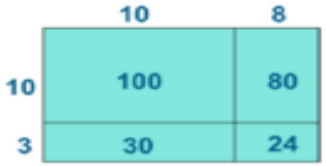
Year 2 Multiplication Key language: double, times, multiplied by, the product of, groups of, lots of, equal groups

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.   	Count in multiples of a number aloud. Write sequences with multiples of numbers. 0, 2, 4, 6, 8, 10 0, 3, 6, 9, 12, 15 0, 5, 10, 15, 20, 25 , 30 $4 \times 3 = \square$

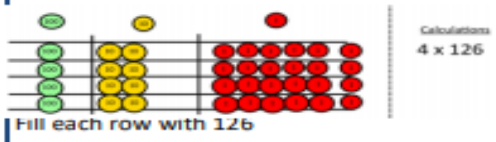
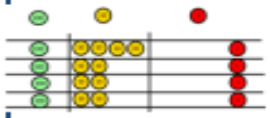
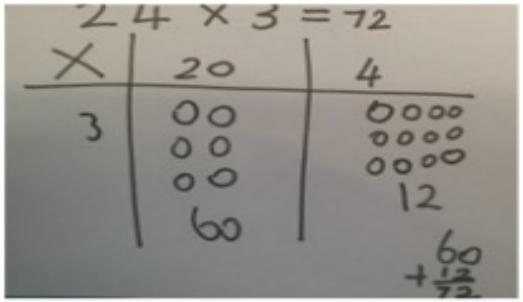
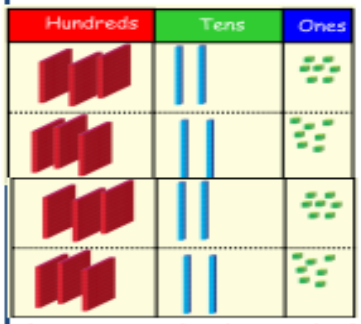
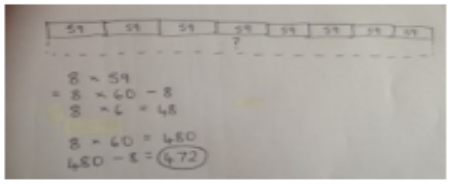
Year 2 Multiplication Key language: double, times, multiplied by, the product of, groups of, lots of, equal groups

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

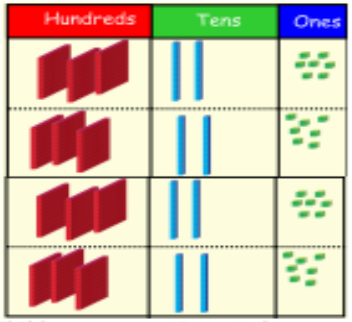
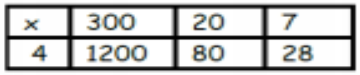
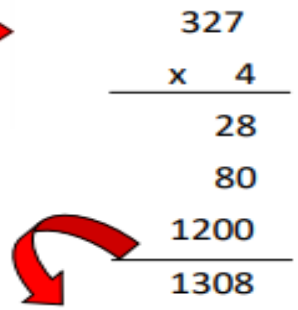
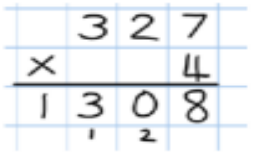
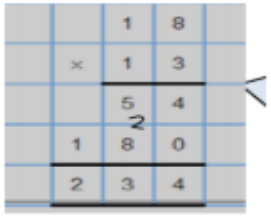
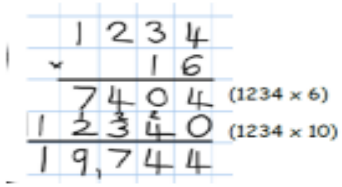
Year 3 Multiplication Key language: double, times, multiplied by, the product of, groups of, lots of, equal groups

Objective & Strategy	Concrete	Pictorial	Abstract
Grid method	Show the links with arrays to first introduce the grid method  4 rows of 10 4 rows of 3 Move onto base ten to move towards a more compact method.  4 rows of 13 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  Calculations 4 x 126 Fill each row with 126  Calculations 4 x 126 Add up each column, starting with the ones making any exchanges needed  Then you have your answer.	Children can represent their work with place value counters in a way that they understand. They can draw the counters using colours to show different amounts or just use the circles in the different columns to show their thinking as shown below.  Bar model are used to explore missing numbers  4 x ☐ = 20 20 4	Start with multiplying by one digit numbers and showing the clear addition alongside the grid. × | 30 | 5 7 | 210 | 35 210 + 35 = 245 Moving forward, multiply by a 2 digit number showing the different rows within the grid method.  10 | 8 10 | 100 | 80 3 | 30 | 24

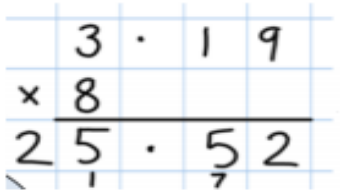
Year 4 Multiplication Key language: double, times, multiplied by, the product of, groups of, lots of, equal groups

Objective & Strategy	Concrete	Pictorial	Abstract
Grid method recap from year 3 for 2 digits x 1 digit Move to multiplying 3 digit numbers by 1 digit. (year 4 expectation)	Use place value counters to show how we are finding groups of a number. We are multiplying by 4 so we need 4 rows  Calculations 4 x 126 Fill each row with 126   Add up each col ies making any exchanges needed	Children can represent their work with place value counters in a way that they understand. They can draw the counters using colours to show different amounts or just use the circles in the different columns to show their thinking as shown below.  	Start with multiplying by one digit numbers and showing the clear addition alongside the grid. | x | 30 | 5 | | --- | --- | --- | | 7 | 210 | 35 | 210 + 35 = 245
Column multiplication	Children can continue to be supported by place value counters at the stage of multiplication. This initially done where there is no regrouping. 321 x 2 = 642  It is important at this stage that they always multiply the ones first. The corresponding long multiplication is modelled alongside	| x | 300 | 20 | 7 | | --- | --- | --- | --- | | 4 | 1200 | 80 | 28 | The grid method my be used to show how this relates to a formal written method.  Bar modelling and number lines can support learners when solving problems with multiplication alongside the formal written methods.	327 x 4 28 80 1200 1308 3 2 7 x 4 1 3 0 8 1 2 This may lead to a compact method.

Year 5-6 Multiplication Key language: double, times, multiplied by, the product of, groups of, lots of, equal groups

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

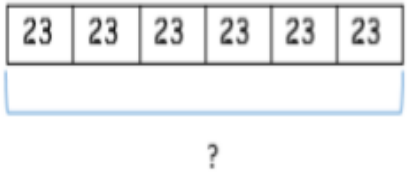
Year 6 Multiplication Key language: double, times, multiplied by, the product of, groups of, lots of, equal groups

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

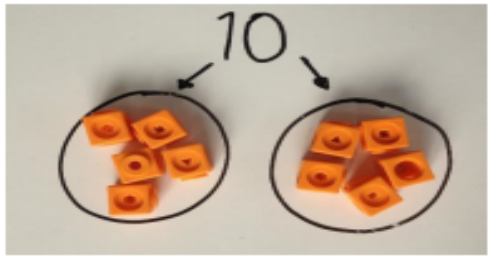
Conceptual Variation- Multiplication

Key language: double, times, multiplied by, the product of, groups of, lots of, equal groups

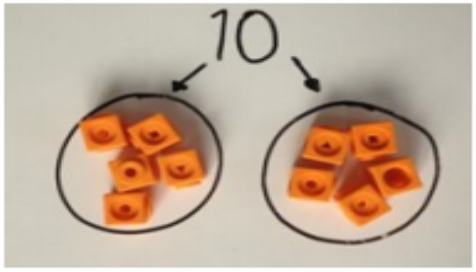
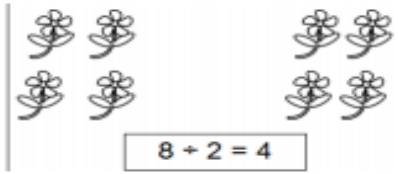
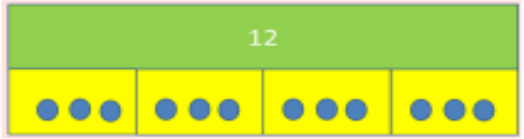
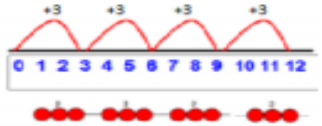
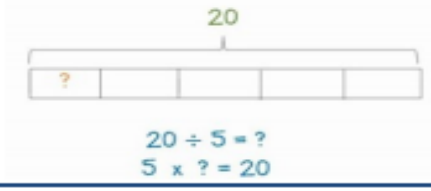
Conceptual variation; different ways to ask children to solve 6 × 23

	Mai had to swim 23 lengths, 6 times a week. How many lengths did she swim in one week? With the counters, prove that 6 x 23 = 138	Find the product of 6 and 23 6 × 23 = □ = 6 × 23 6 × 23 = ___ 23 × 6 = ___	What is the calculation? What is the product? 

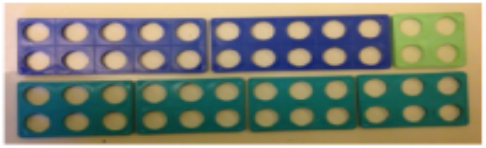
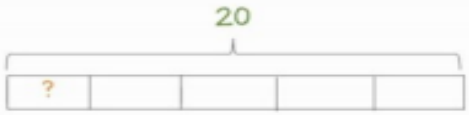
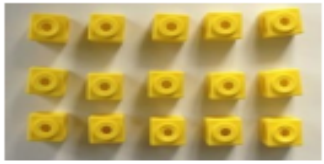
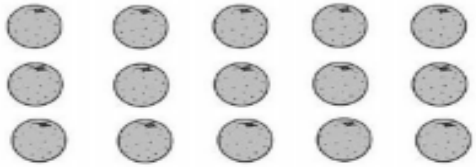
Year 1 Division Key Language: share, group, divide, divided by, half

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

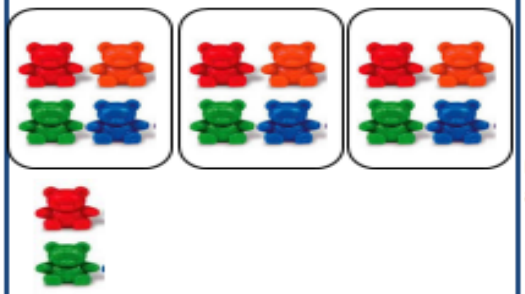
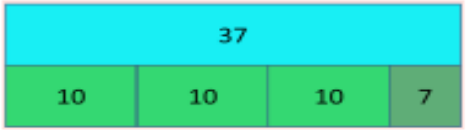
Year 2 Division Key Language: share, group, divide, divided by, half

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.  8 ÷ 2 = 4 Children use bar modelling to show and support understanding.  12 ÷ 4 = 3	12 ÷ 3 = 4
Division as grouping	Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding.  	Use number lines for grouping  12 ÷ 3 = 4 Think of the bar as a whole. Split it into the number of groups you are dividing by and work out how many would be within each group. 	28 ÷ 7 = 4 Divide 28 into 7 groups. How many are in each group?

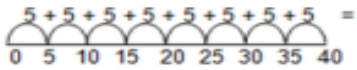
Year 3 Division Key Language: share, group, divide, divided by, half

Objective & Strategy	Concrete	Pictorial	Abstract
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.  20 ÷ 5 = ? 5 x ? = 20	How many groups of 6 in 24? 24 ÷ 6 = 4
Division with arrays	 Link division to multiplication by creating an array and thinking about the number sentences that can be created. Eg 15 ÷ 3 = 5 5 x 3 = 15 15 ÷ 5 = 3 3 x 5 = 15	Draw an array and use lines to split the array into groups to make multiplication and division sentences 	Find the inverse of multiplication and division sentences by creating eight linking number sentences. 7 x 4 = 28 4 x 7 = 28 28 ÷ 7 = 4 28 ÷ 4 = 7 28 = 7 x 4 28 = 4 x 7 4 = 28 ÷ 7 7 = 28 ÷ 4

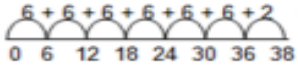
Year 3 Division Key Language: share, group, divide, divided by, half

Objective & Strategy	Concrete	Pictorial	Abstract
Division with remainders.	14 ÷ 3 = Divide objects between groups and see how much is left over 	Jump forward in equal jumps on a number line then see how many more you need to jump to find a remainder.  Draw dots and group them to divide an amount and clearly show a remainder.  Use bar models to show division with remainders. 	Complete written divisions and show the remainder using r. 

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

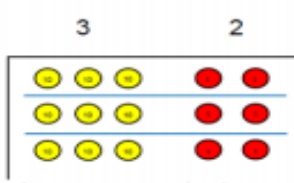
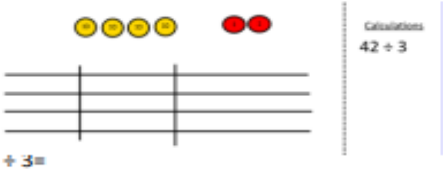
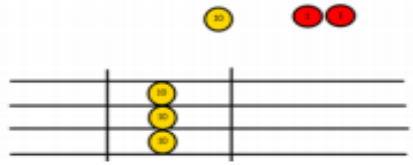
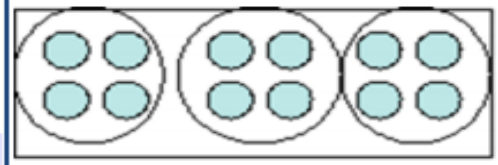
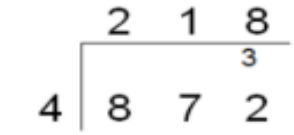
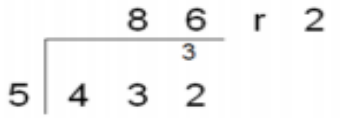
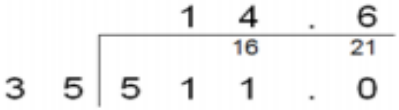
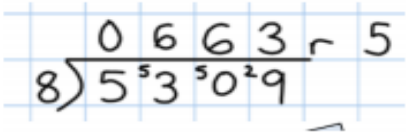


Example with remainder:
38 ÷ 6



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

Year 4-6 Division Key Language: share, group, divide, divided by

Objective & Strategy	Concrete	Pictorial	Abstract
Divide at least 3 digit numbers by 1 digit. Short Division	96 ÷ 3 Tens Units 3 2 3  Use place value counters to divide using the bus stop method alongside  42 ÷ 3= Start with the biggest place value, we are sharing 40 into three groups. We can put 1 ten in each group and we have 1 ten left over.  We exchange this ten for ten ones and then share the ones equally among the groups.  We look how much in 1 group so the answer is 14.	Students can continue to use drawn diagrams with dots or circles to help them divide numbers into equal groups.  Encourage them to move towards counting in multiples to divide more efficiently.	Begin with divisions that divide equally with no remainder.  Move onto divisions with a remainder.  Finally move into decimal places to divide the total accurately.  

Year 6 Long Division Key Language: share, group, divide, divided by

Long Division

Step 1—a remainder in the ones

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

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

4 goes into 16 four times.

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

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

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

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

Long Division

Step 1 continued...

h	t	o
	6	1
4)	2	4 7
	−	4
		3

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

Check: 4 × 61 + 3 = 247

th	h	t	o
	4	0	2
4)	1	6	0 9
		−	8
			1

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

Check: 4 × 402 + 1 = 1,609

Long Division

Step 2—a remainder in the tens

1. Divide.	2. Multiply & subtract.	3. Drop down the next digit.
t o 2 2)5 8	t o 2 2)5 8 - 4 1	t o 2 9 2)5 8 - 4 ↓ 1 8
Two goes into 5 two times, or 5 tens ÷ 2 = 2 whole tens -- but there is a remainder!	To find it, multiply 2 × 2 = 4, write that 4 under the five, and subtract to find the remainder of 1 ten.	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.

1. Divide.	2. Multiply & subtract.	3. Drop down the next digit.
t o 2 9 2)5 8 - 4 1 8	t o 2 9 2)5 8 - 4 1 8 - 1 8 0	t o 2 9 2)5 8 - 4 1 8 - 1 8 0
Divide 2 into 18. Place 9 into the quotient.	Multiply 9 × 2 = 18, write that 18 under the 18, and subtract.	The division is over since there are no more digits in the dividend. The quotient is 29.

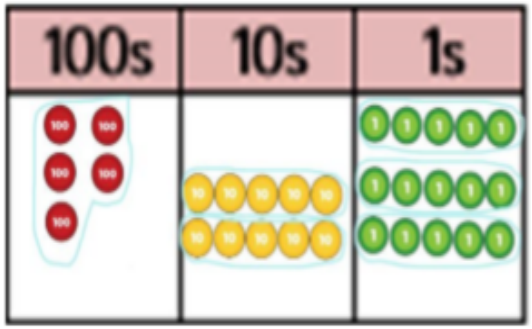
Long Division

Step 2—a remainder in any of the place values

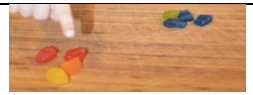
1. Divide.	2. Multiply & subtract.	3. Drop down the next digit.
h t o 1 2)2 7 8 Two goes into 2 one time, or 2 hundreds ÷ 2 = 1 hundred.	h t o 1 2)2 7 8 -2 0 Multiply 1 × 2 = 2, write that 2 under the two, and subtract to find the remainder of zero.	h t o 1 8 2)2 7 8 -2 ↓ 0 7 Next, drop down the 7 of the tens next to the zero.
Divide.	**Multiply & subtract.**	**Drop down the next digit.**
h t o 1 3 2)2 7 8 -2 0 7 Divide 2 into 7. Place 3 into the quotient.	h t o 1 3 2)2 7 8 -2 0 7 - 6 1 Multiply 3 × 2 = 6, write that 6 under the 7, and subtract to find the remainder of 1 ten.	h t o 1 3 2)2 7 8 -2 0 7 - 6 1 8 Next, drop down the 8 of the ones next to the 1 leftover ten.
1. Divide.	**2. Multiply & subtract.**	**3. Drop down the next digit.**
h t o 1 3 9 2)2 7 8 -2 0 7 - 6 1 8 Divide 2 into 18. Place 9 into the quotient.	h t o 1 3 9 2)2 7 8 -2 0 7 - 6 1 8 -1 8 0 Multiply 9 × 2 = 18, write that 18 under the 18, and subtract to find the remainder of zero.	h t o 1 3 9 2)2 7 8 -2 0 7 - 6 1 8 -1 8 0 There are no more digits to drop down. The quotient is 139.

Conceptual variation – Division Key Language: share, group, divide, divided by

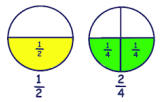
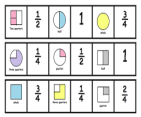
Conceptual variation; different ways to ask children to solve 615 ÷ 5

Using the part whole model below, how can you divide 615 by 5 without using short division?  	I have £615 and share it equally between 5 bank accounts. How much will be in each account? 615 pupils need to be put into 5 groups. How many will be in each group?	$5 \overline{)615}$ 615 ÷ 5 = ☐ = 615 ÷ 5	What is the calculation? What is the answer? 

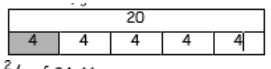
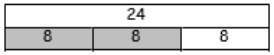
Year 1 Fractions

Objective and Strategy	Concrete	Pictorial	Abstract
Finding a half Finding a quarter Find some fractions of amounts	 Use objects to play and problem solve. Finding fractions of a number is linked to strategies used when sharing and grouping in division. Children use concrete objects and pictures to answer questions such as What is ½ of 12? Children recognise ½ and ¼. They can find these fractions of a shape, object or number. 	Solve one---step problems involving fractions, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher	Recognise, find and name a half as one of two equal parts.

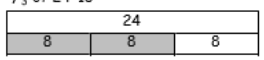
Year 2 Fractions

Objectives and Strategies	Concrete	Pictorial	Abstract
Recognise and write unit fractions Recognise and write 2/4 and ¾ Find simple fractions of quantities Find simple equivalent fractions	Children recognise $^1/_3$, $^1/_4$, $^2/_4$ and $^3/_4$. They can find these fractions of length, shape and quantity such as What is ¼ of 16? Children can record statements such as ½ of 6 = 3. They make links between this and division.	  Children understand the equivalence of $^2/_4$ and $^1/_2$ Children count in fractions (½, 1, 1½) and visualise them on a number line.	Recognise quarters and halves of shapes and visuals. Understand a fraction is an equal part of a whole. Solve simple reasoning problems. Using jottings, children can find simple unit fractions of amounts. Recognise quarters and halves of shapes and visuals. Understand a fraction is an equal part of a whole.

Year 3 Fractions

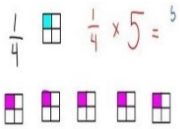
Objectives and Strategies	Pictorial	Concrete	Abstract
Count up and down in tenths Recognise that tenths arise from dividing an object into 10 equal parts Find and write fractions of a discrete set of numbers Dhow equivalent fractions Add and subtract fractions with the same denominator Compare and order fractions	Children will continue to find and write fractions of a quantity or number of objects. These will be linked to their known multiplication and division facts e.g. What is $^{1}/_{5}$ of 20? 20 = 5 lots of 4 They will also start to calculate quantities that include non-unit fractions (fractions where the numerator is greater than 1) e.g. 2/3 of 24 = 16. Children will add and subtract fractions with the same denominator within one whole.  $^{2}/_{3}$ of 24=16 	Children understand what a tenth is and can count up and back down in them to 1. Children can recognize and show some equivalent fractions.	Children will add and subtract fractions with the same denominator within one whole. Continue to use fractions on a number line.

Year 4 Fractions

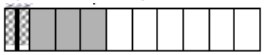
Objectives and Strategies	Pictorial	Concrete	Abstract
Find families of common equivalent fractions. Count up and down in hundredths Understand the value of 1/100 Find fractions of amounts Show equivalent fractions Add and subtract fractions with the same denominator.	Continue to add and subtract fractions with the same denominator e.g. $^{5}/_{7} + {}^{1}/_{7} = {}^{6}/_{7}$ Recognise and write decimal equivalence of tenths, hundredths, ¼, ½ and ¾ e.g. $^{1}/_{10} = 0.1$ $^{2}/_{10} = 0.2$ Children understand what a hundredth ($^{1}/_{100}$) is and can count up and back down in them. Children continue to calculate quantities that include non-unit fractions (fractions where the numerator is greater than 1) e.g. $^{2}/_{3}$ of 24=16 $^{2}/_{3}$ of 24=16 	Children continue to calculate quantities that include non-unit fractions (fractions where the numerator is greater than 1) e.g. $^{2}/_{3}$ of 24=16	Children continue to calculate quantities that include non-unit fractions (fractions where the numerator is greater than 1) e.g. $^{2}/_{3}$ of 24=16 Children can find non-unit fractions of amounts. Continue to use fractions on a numberline.

Year 5 Fractions

Objectives and Strategies	Pictorial	Concrete	Abstract
Compare and order fractions with differing denominators (same multiple) Convert between mixed numbers and improper fractions Add ad subtract fractions with denominators that are multiples of the same number Multiply fractions by whole numbers, Recognise the relationship between tenths and hundredths and place value. Understand and use simple percentages.	Children add and subtract fractions with the same denominator e.g. 4/10 + 2/10 = 6/10 As well as adding and subtracting fractions where the denominators are multiples of the same number, so a lowest common denominator needs to be found e.g. 2/3 + 1/6 4/6 + 1/6 =5/6 Children multiply proper fractions by a whole number e.g. 2/3 x 5 = 10/3 10/3 = 3 1/3 As well as multiplying mixed number fractions by whole numbers e.g. 1 3/8 x 3 = This could be achieved by turning the mixed number fraction to an improper fraction and then multiplying e.g. 11/8 x 3 = 33/8 = 4 1/8 or multiply the whole number by three and the	Introduce percentages and know the percentage and decimal equivalents of ½, 1/4, 1/5, 2/5, 4/5 and fractions with a denominator of a multiple of 10 or 25.	Children add and subtract, multiply and divide fractions with differing denominators. This includes mixed numbers and improper fractions. Children can recognise and show the equivalence of any fraction.

	fraction by three and adding them together e.g. 1 3/8 x 3 1 x 3 = 3 3/8 x 3 = 9/8 3 + 9/8 = 3 9/8 = 4 1/8 		

Year 6 Fractions

Objectives and Strategies	Concrete	Abstract
Simplify fractions using common multiples Compare and order fractions Multiply and divide fractions Recognise decimal equivalents Round decimal equivalents Identify place values of decimals.	Children simplify fractions using common fractions and use common multiples to express fractions in the same denomination. Add and subtract fractions with different denominators, so a lowest common denominator needs to be found e.g. 1/3 + 1/5 = 5/15 + 3/15 = 8/15 As well as mixed numbers e.g. 2 ¾ + 3 ½ = 6 ¼ Multiply pairs of proper fractions e.g. 1/2 x 2/5 = 1/5 This could be solved by using visuals. Each fifth is then split in half to show it has been multiplied by ½.  The dotted section shows half of 2/5 which is 2/10 of the whole and can **be simplified as 1/5** **Divide fractions by whole numbers e.g. 2/5 ÷ 4 = 1/10** **This could be solved by recognising that it means the same as 2/5 x ¼ = 2/20** **2/20 can be simplified as 1/10** **or changing 2/5 to the equivalent fraction 4/10 as here the numerator is a multiple of 4.** **4/10 ÷ 4 = 1/10** 	Perform mental calculations, including with mixed numbers and fractions with simple differing denominators. Solve a range of reasoning problems. Know most common decimal and percentage equivalents.

Acknowledgements

White Rose: https://www.tes.com/teaching-resource/calculation-policy-11664888

Maths Hub: https://www.ncetm.org.uk/resources/48070

Recommended Maths Websites:

BBC KS1 Maths http://www.bbc.co.uk/education/subjects/zjxhfg8

BBC KS2 Maths http://www.bbc.co.uk/education/subjects/z826n39

Singapore Maths (Using 'Bar Method' Modelling To Solve Word Problems)

http://www.mathplayground.com/thinkingblocks.